**3GPP TSG-RAN2 Meeting #129bisR2-250nnnn**

**Wuhan, China, 7th – 11th April 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** |  | **rev** |  | **Current version:** | **18.4.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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|  |
| ***Title:***  | Running CR for SONMDT features |
|  |  |
| ***Source to WG:*** | Ericsson, ZTE |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_ENDC\_SON\_MDT\_Ph4-Core |  | ***Date:*** | 2025-02-07 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-19 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | This running CR implements all the agreements related to the Rel.19 SON/MDT WI that affects RRC technical specification up to the meeting RAN2#129. |
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| ***Summary of change:*** | The SONMDT agreements up to RAN2#129 affecting the RRC spec are captured in the running CR. |
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| ***Consequences if not approved:*** | Rel-19 RRC specification will not include the new functionalities agreed for the Rel. 19 SON/MDTAI/ML for NR air interface functionalities agreed for Rel-19. |
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| ***Clauses affected:*** | 5.3.3.4, 5.3.5.3, 5.3.5.18.6,5.3.7.3, 5.3.10.5, 5.7.3.5, 5.7.10.3, 5.7.10.4, 5.7.10.5, 5.7.10.6, 5.7.10.7, 6.2.2, 6.3.2  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

FIRST CHANGE

#### 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> if the UE is NCR-MT:

3> indicate to NCR-Fwd to cease forwarding;

2> if *sdt-MAC-PHY-CG-Config* is configured:

3> instruct the MAC entity to stop the *cg-SDT-TimeAlignmentTimer*, if it is running;

3> instruct the MAC entity to start the *timeAlignmentTimer* associated with the PTAG indicated by *tag-Id,* if it is not running;

2> if *srs-PosRRC-Inactive* is configured:

3> instruct the MAC entity to stop the *inactivePosSRS-TimeAlignmentTimer*, if it is running;

2> if *srs-PosRRC-InactiveValidityAreaPreConfigList* or *srs-PosRRC-InactiveValidityAreaNonPreConfig* is configured:

3> instruct the MAC entity to stop the *inactivePosSRS-ValidityAreaTAT*, if it is running;

2> if the UE is configured to receive MBS multicast in RRC\_INACTIVE:

3> reset MAC;

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 and broadcast MRBs, 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, CCCH configuration and broadcast MRBs;

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

2> for each application layer measurement configuration with *appLayerIdleInactiveConfig* absent:

3> forward the *measConfigAppLayerId* and inform upper layers about the release of the application layer measurement configuration;

3> release the application layer measurement configuration;

3> discard any application layer measurement reports which were not yet fully submitted to lower layers for transmission;

3> consider itself not to be configured to send application layer measurement reports for the *measConfigAppLayerId*;

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, T319;

1> if T319a is running:

2> stop T319a;

2> consider SDT procedure is not ongoing;

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;

2> stop relay (re)selection procedure if any for L2 U2N Remote UE;

1> consider the current cell to be the PCell;

1> perform the L2 U2N Remote UE configuration procedure in accordance with the received *sl-L2RemoteUE-Config* as specified in 5.3.5.16;

1> perform the sidelink dedicated configuration procedure in accordance with the received *sl-ConfigDedicatedNR* as specified in 5.3.5.14;

1> 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*:

2> if *reconnectCellId* in *VarRLF-Report* is not set after failing to perform reestablishment and if this is the first *RRCSetup* received by the UE after declaring the failure:

3> if the UE supports RLF-Report for conditional handover and if *choCellId* in *VarRLF-Report* is set, or

3> if the UE supports RLF-Report for LTM cell switch and if *ltm-RecoveryCellId* in *VarRLF-Report* is set:

4> set *timeUntilReconnection* in *VarRLF-Report* to the time that elapsed since the radio link failure, or reconfiguration with sync failure experienced in the *failedPCellId* stored in *VarRLF-Report*;

3> else:

4> set *timeUntilReconnection* in *VarRLF-Report* to the time that elapsed since the last radio link failure or handover failure;

3> set *nrReconnectCellId* in *reconnectCellId* in *VarRLF-Report* to the global cell identity and the tracking area code of the PCell;

1> if the UE supports RLF report for inter-RAT MRO NR as defined in TS 36.306 [62], and if the UE has radio link failure or handover failure information available in *VarRLF-Report* of TS 36.331 [10] and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report* of TS 36.331 [10]:

2> if *reconnectCellId* in *VarRLF-Report* of TS 36.331[10] is not set after failing to perform reestablishment and if this is the first *RRCSetup* received by the UE after declaring the failure:

3> set *timeUntilReconnection* in *VarRLF-Report* of TS 36.331[10] to the time that elapsed since the last radio link failure or handover failure in LTE;

3> set *nrReconnectCellId* in *reconnectCellId* in *VarRLF-Report* of TS 36.331[10] to the global cell identity and the tracking area code of the PCell;

1> for each application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

2> if the RPLMN is not included in *plmn-IdentityList* in *VarAppLayerPLMN-ListConfig*:

3> forward the *measConfigAppLayerId* and inform upper layers about the release of the application layer measurement configuration;

3> release the application layer measurement configuration including its fields in the UE variables *VarAppLayerIdleConfig* and *VarAppLayerPLMN-ListConfig*;

3> discard any application layer measurement reports which were not yet fully submitted to lower layers for transmission;

3> consider itself not to be configured to send application layer measurement reports for the *measConfigAppLayerId*;

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> if upper layers selected an SNPN or a PLMN and in case of PLMN UE is either allowed or instructed to access the PLMN via a cell for which at least one CAG ID is broadcast:

3> set the *selectedPLMN-Identity* from the *npn-IdentityInfoList*;

2> else:

3> set the *selectedPLMN-Identity* to the PLMN selected by upper layers from the *plmn-IdentityInfoList*;

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> if upper layers provide onboarding request indication:

3> include the *onboardingRequest*;

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

2> if connecting as an IAB-node but not as a mobile IAB-node:

3> include the *iab-NodeIndication*;

2> else if connecting as a mobile IAB-node:

3> include the *mobileIAB-NodeIndication*;

2> if connecting as an NCR-node:

3> include the *ncr-NodeIndication*;

2> if the SIB1 contains *idleModeMeasurementsNR* and the UE has NR idle/inactive measurement information concerning cells other than the PCell available in *VarMeasIdleReport*; or

2> if the SIB1 contains *idleModeMeasurementsEUTRA* and the UE has E-UTRA idle/inactive measurement information available in *VarMeasIdleReport*:

3> include the *idleMeasAvailable*;

2> if the SIB1 contains *reselectionMeasurementsNR* and the UE has valid NR reselection measurements available for any frequency listed in *measReselectionCarrierListNR* in *VarMeasReselectionConfig*:

3> include the *reselectionMeasAvailable*;

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

2> if the UE has logged measurements available for NR and if the current registered SNPN identity is included in *snpn-ConfigID-List* stored in *VarLogMeasReport*:

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

3> if Bluetooth measurement results are included in the logged measurements the UE has available for NR:

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

3> if WLAN measurement results are included in the logged measurements the UE has available for NR:

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

2> if the *sigLoggedMeasType* in *VarLogMeasReport* is included; or

2> if the UE supports the override protection of the signalling based logged MDT for inter-RAT (i.e. LTE to NR), and if the *sigLoggedMeasType* in *VarLogMeasReport* of TS 36.331 [10] is included:

3> if T330 timer is running (associated to the logged measurement configuration for NR or for LTE):

4> set *sigLogMeasConfigAvailable* to *true* in the *RRCSetupComplete* message;

3> else:

4> if the UE has logged measurements in *VarLogMeasReport* or in *VarLogMeasReport* of TS 36.331 [10]:

5> set *sigLogMeasConfigAvailable* to *false* in the *RRCSetupComplete* message;

2> if the UE has connection establishment failure or connection resume failure information available in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport* or in at least one of the entries of *VarConnEstFailReportList*; or

2> if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the current registered SNPN identity is equal to *snpn-Identity* stored in *VarConnEstFailReport* or any entry of *VarConnEstFailReportList*:

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*, or

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]; or

2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in the *VarRLF-Report*:

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

2> if the UE has successful handover information available in *VarSuccessHO-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarSuccessHO-Report; or*

2> if the UE has successful handover information available in *VarSuccessHO-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in the *VarSuccessHO-Report*:

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

2> if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarSuccessPSCell-Report*; or

2> if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in the *VarSuccessPSCell-Report*:

3> include *successPSCell-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> if the UE has at least one stored application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

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

2> if the UE supports uplink RRC message segmentation of *UECapabilityInformation* according to the network indication *rrc-SegAllowed*:

3> may include the *ul-RRC-Segmentation* in the *RRCSetupComplete* message;

2> if the UE supports uplink RRC message segmentation of *UECapabilityInformation* according to the network indication *rrc-MaxCapaSegAllowed*:

3> include the *ul-RRC-MaxCapaSegments* in the *RRCSetupComplete* message;

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

3> if *speedStateReselectionPars* is configured in the *SIB2*:

4> 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;

2> if *SIB1* contains *musim-CapRestrictionAllowed*:

3> if supported, include the *musim-CapRestrictionInd* in the *RRCSetupComplete* message upon determining it has temporary capability restriction;

2> if the UE has flight path information available:

3> include *flightPathInfoAvailable*;

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

NOTE: Upon reception of *musim-CapRestrictionInd* in *RRCSetupComplete*, it is up to network implementation to configure the UE with a limited configuration that is used until network sends *RRCReconfiguration* based on the actual restricted UE capabilities included in *UEAssistanceInformation*.

Editor’s Note: FFS of the UE capability of supporting RLF-Report for LTM cell switch.NEXT CHANGE

#### 5.3.5.3 Reception of an *RRCReconfiguration* by the UE

The UE shall perform the following actions upon reception of the *RRCReconfiguration,* upon execution of the conditional reconfiguration (CHO, CPA, CPC, or subsequent CPAC), or upon execution of an LTM cell switch:

1> if the *RRCReconfiguration* is applied due to a conditional reconfiguration execution upon cell selection performed while timer T311 was running, as defined in 5.3.7.3:

2> remove all the entries in the *condReconfigList* within the MCG and the SCG *VarConditionalReconfig* except for the entries in which *subsequentCondReconfig* is present, if any;

1> if the *RRCReconfiguration* includes the *daps-SourceRelease*:

2> reset the source MAC and release the source MAC configuration;

2> for each DAPS bearer:

3> release the RLC entity or entities as specified in TS 38.322 [4], clause 5.1.3, and the associated logical channel for the source SpCell;

3> reconfigure the PDCP entity to release DAPS as specified in TS 38.323 [5];

2> for each SRB:

3> release the PDCP entity for the source SpCell;

3> release the RLC entity as specified in TS 38.322 [4], clause 5.1.3, and the associated logical channel for the source SpCell;

2> release the physical channel configuration for the source SpCell;

2> discard the keys used in the source SpCell (the KgNB key, the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key), if any;

1> if the *RRCReconfiguration* is received while the timer T348 is running:

2> if the configuration does not exceed UE temporary capability restriction indicated via *musim-CapRestriction* included in the last transmission of *UEAssistanceInformation*:

3> stop the timer T348;

1> if the *RRCReconfiguration* is received via other RAT (i.e., inter-RAT handover to NR):

2> if the *RRCReconfiguration* does not include the *fullConfig* and the UE is connected to 5GC (i.e., delta signalling during intra 5GC handover):

3> re-use the source RAT SDAP and PDCP configurations if available (i.e., current SDAP/PDCP configurations for all RBs from source E-UTRA RAT prior to the reception of the inter-RAT HO *RRCReconfiguration* message);

1> else:

2> if the RRCReconfiguration includes the fullConfig:

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

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

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

1> if the *RRCReconfiguration* includes the *masterKeyUpdate*:

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

1> if the *RRCReconfiguration* includes the *sk-Counter*:

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

1> if the *RRCReconfiguration* includes the *secondaryCellGroup*:

2> perform the cell group configuration for the SCG according to 5.3.5.5;

1> if the *RRCReconfiguration* includes the *mrdc-SecondaryCellGroupConfig:*

2> if the *mrdc-SecondaryCellGroupConfig* is set to *setup*:

3> if the *mrdc-SecondaryCellGroupConfig* includes *mrdc-ReleaseAndAdd*:

4> perform MR-DC release as specified in clause 5.3.5.10;

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

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

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

4> 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*;

2> else (*mrdc-SecondaryCellGroupConfig* is set to *release*):

3> perform MR-DC release as specified in clause 5.3.5.10;

NOTE 00: If the UE receives, within an LTM candidate configuration, an *mrdc-SecondaryCellGroupConfig* set to *release* even if no SCG is currently configured at the UE, the UE does not consider this as an invalid configuration.

1> if the *RRCReconfiguration* message includes the *radioBearerConfig*:

2> perform the radio bearer configuration according to 5.3.5.6;

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

2> perform the radio bearer configuration according to 5.3.5.6;

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

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

1> if the *RRCReconfiguration* message includes the *dedicatedNAS-MessageList*:

2> forward each element of the *dedicatedNAS-MessageList* to upper layers in the same order as listed;

1> if the *RRCReconfiguration* message includes the *dedicatedSIB1-Delivery*:

2> perform the action upon reception of *SIB1* as specified in 5.2.2.4.2;

NOTE 0: If this *RRCReconfiguration* is associated to the MCG and includes *reconfigurationWithSync* in *spCellConfig* and *dedicatedSIB1-Delivery*, the UE initiates (if needed) the request to acquire required SIBs, according to clause 5.2.2.3.5, only after the random access procedure or the LTM cell switch execution towards the target SpCell is completed.

1> if the *RRCReconfiguration* message includes the *dedicatedSystemInformationDelivery*:

2> perform the action upon reception of System Information as specified in 5.2.2.4;

2> if all the SIB(s) and/or posSIB(s) requested in *DedicatedSIBRequest* message have been acquired:

3> stop timer T350, if running;

1> if the *RRCReconfiguration* message includes the *dedicatedPosSysInfoDelivery*:

2> perform the action upon reception of the contained posSIB(s), as specified in clause 5.2.2.4.16;

2> if all the SIB(s) and/or posSIB(s) requested in *DedicatedSIBRequest* message have been acquired:

3> stop timer T350, if running;

1> if the *RRCReconfiguration* message includes the *otherConfig*:

2> perform the other configuration procedure as specified in 5.3.5.9;

1> if the *RRCReconfiguration* message includes the *bap-Config*:

2> perform the BAP configuration procedure as specified in 5.3.5.12;

1> if the *RRCReconfiguration* message includes the *iab-IP-AddressConfigurationList*:

2> if *iab-IP-AddressToReleaseList* is included:

3> perform release of IP address as specified in 5.3.5.12a.1.1;

2> if *iab-IP-AddressToAddModList* is included:

3> perform IAB IP address addition/update as specified in 5.3.5.12a.1.2;

1> if the *RRCReconfiguration* message includes the *conditionalReconfiguration*:

2> perform conditional reconfiguration as specified in 5.3.5.13;

1> if the *RRCReconfiguration* message includes the *needForGapsConfigNR*:

2> if *needForGapsConfigNR* is set to *setup*:

3> consider itself to be configured to provide the measurement gap requirement information of NR target bands;

2> else:

3> consider itself not to be configured to provide the measurement gap requirement information of NR target bands;

1> if the *RRCReconfiguration* message includes the *needForGapNCSG-ConfigNR*:

2> if *needForGapNCSG-ConfigNR* is set to *setup*:

3> consider itself to be configured to provide the measurement gap and NCSG requirement information of NR target bands;

2> else:

3> consider itself not to be configured to provide the measurement gap and NCSG requirement information of NR target bands;

1> if the *RRCReconfiguration* message includes the *needForGapNCSG-ConfigEUTRA*:

2> if *needForGapNCSG-ConfigEUTRA* is set to *setup*:

3> consider itself to be configured to provide the measurement gap and NCSG requirement information of E‑UTRA target bands;

2> else:

3> consider itself not to be configured to provide the measurement gap and NCSG requirement information of E‑UTRA target bands;

1> if the *RRCReconfiguration* message includes the *onDemandSIB-Request*:

2> if *onDemandSIB-Request* is set to *setup*:

3> consider itself to be configured to request SIB(s) or posSIB(s) in RRC\_CONNECTED in accordance with clause 5.2.2.3.5;

2> else:

3> consider itself not to be configured to request SIB(s) or posSIB(s) in RRC\_CONNECTED in accordance with clause 5.2.2.3.5;

3> stop timer T350, if running;

1> if the *RRCReconfiguration* message includes the *sl-ConfigDedicatedNR*:

2> perform the sidelink dedicated configuration procedure as specified in 5.3.5.14;

NOTE 0a: If the *sl-ConfigDedicatedNR* was received embedded within an E-UTRA *RRCConnectionReconfiguration* message, the UE does not build an NR *RRCReconfigurationComplete* message for the received *sl-ConfigDedicatedNR*.

1> if the *RRCReconfiguration* message includes the *sl-L2RelayUE-Config*:

2> perform the L2 U2N or U2U Relay UE configuration procedure as specified in 5.3.5.15;

1> if the *RRCReconfiguration* message includes the *sl-L2RemoteUE-Config*:

2> perform the L2 U2N or U2U Remote UE configuration procedure as specified in 5.3.5.16;

1> if the *RRCReconfiguration* message includes the *dedicatedPagingDelivery*:

2> perform the *Paging* message reception procedure as specified in 5.3.2.3;

1> if the *RRCReconfiguration* message includes the *sl-ConfigDedicatedEUTRA-Info*:

2> perform related procedures for V2X sidelink communication in accordance with TS 36.331 [10], clause 5.3.10 and clause 5.5.2;

1> if the *RRCReconfiguration* message includes the *ul-GapFR2-Config*:

2> perform the FR2 UL gap configuration procedure as specified in 5.3.5.13c;

1> if the *RRCReconfiguration* message includes the *musim-GapConfig*:

2> perform the MUSIM gap configuration procedure as specified in 5.3.5.9a;

1> if the *RRCReconfiguration* message includes the *appLayerMeasConfig*:

2> for each application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

3> if the RPLMN is not included in *plmn-IdentityList* in *VarAppLayerPLMN-ListConfig*:

4> forward the *measConfigAppLayerId* and inform upper layers about the release of the application layer measurement configuration;

4> release the application layer measurement configuration including its fields in the UE variables *VarAppLayerIdleConfig* and *VarAppLayerPLMN-ListConfig*;

4> discard any application layer measurement reports which were not yet fully submitted to lower layers for transmission;

4> consider itself not to be configured to send application layer measurement report for the *measConfigAppLayerId*;

2> if *idleInactiveReportAllowed* is included in the *RRCReconfiguration* message:

3> if the UE is configured with at least one application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

4> initiate the procedure in 5.7.16.2 after the *RRCReconfigurationComplete* has been transmitted;

2> else:

3> for each application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

4> forward the *measConfigAppLayerId* and inform upper layers about the release of the application layer measurement configuration;

4> release the application layer measurement configuration including its fields in the UE variables *VarAppLayerIdleConfig* and *VarAppLayerPLMN-ListConfig*;

4> discard any application layer measurement reports which were not yet fully submitted to lower layers for transmission;

4> consider itself not to be configured to send application layer measurement reports for the *measConfigAppLayerId*;

2> perform the application layer measurement configuration procedure as specified in 5.3.5.13d;

1> if the *RRCReconfiguration* message includes the *ue-TxTEG-RequestUL-TDOA-Config*:

2> if *ue-TxTEG-RequestUL-TDOA-Config* is set to *setup*:

3> perform the UE positioning assistance information procedure as specified in 5.7.14;

2> else:

3> release the configuration of UE positioning assistance information;

1> if the *RRCReconfiguration* message includes the *aerial-Config*:

2> (re)configure the aerial parameters in accordance with the included *aerial-Config*;

1> if the *RRCReconfiguration* message includes the *sl-IndirectPathAddChange*:

2> perform the SL indirect path specific configuration procedure as specified in 5.3.5.17.2.2;

1> if the *RRCReconfiguration* message includes the *n3c-IndirectPathAddChange*:

2> perform configuration procedure for the remote UE part of N3C indirect path as specified in 5.3.5.17.3.2;

1> if the *RRCReconfiguration* message includes the *n3c-IndirectPathConfigRelay*:

2> perform the configuration procedure for the relay UE part of N3C indirect path as specified in 5.3.5.17.3.3;

1> if the *RRCReconfiguration* message includes the *ltm-Config*:

2> if the *ltm-Config* is set to *setup*:

3> perform the LTM configuration procedure as specified in 5.3.5.18.1;

2> else:

3> perform the LTM configuration release procedure as specified in clause 5.3.5.18.7;

1> if the *RRCReconfiguration* message includes the *srs-PosResourceSetLinkedForAggBWList*:

2> if *srs-PosResourceSetLinkedForAggBWList* is set to *setup*:

3> perform the SRS for positioning transmission using bandwidth aggregation provided in configuration *srs-PosResourceSetLinkedForAggBW* as specified in TS 38.211 [16];

2> else:

3> release all the configuration of *srs-PosResourceSetLinkedForAggBW*;

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

2> if the *RRCReconfiguration* includes the *masterCellGroup* containing 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 *RRCReconfiguration* includes the *masterCellGroup* containing the *reportUplinkTxDirectCurrentTwoCarrier*:

3> include in the *uplinkTxDirectCurrentTwoCarrierList* the list of uplink Tx DC locations for the configured intra-band uplink carrier aggregation in the MCG;

2> if the *RRCReconfiguration* includes the *masterCellGroup* containing the *reportUplinkTxDirectCurrentMoreCarrier*:

3> include in the *uplinkTxDirectCurrentMoreCarrierList* the list of uplink Tx DC locations for the configured intra-band uplink carrier aggregation in the MCG;

2> if the *RRCReconfiguration* includes the *secondaryCellGroup* containing the *reportUplinkTxDirectCurrent*:

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

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

2> if the *RRCReconfiguration* includes the *secondaryCellGroup* containing the *reportUplinkTxDirectCurrentTwoCarrier*:

3> include in the *uplinkTxDirectCurrentTwoCarrierList* the list of uplink Tx DC locations for the configured intra-band uplink carrier aggregation in the SCG;

2> if the *RRCReconfiguration* includes the *secondaryCellGroup* containing the *reportUplinkTxDirectCurrentMoreCarrier*:

3> include in the *uplinkTxDirectCurrentMoreCarrierList* the list of uplink Tx DC locations for the configured intra-band uplink carrier aggregation in the SCG;

NOTE 0b: The UE does not expect that the *reportUplinkTxDirectCurrentTwoCarrier* or *reportUplinkTxDirectCurrentMoreCarrier* is received in both *masterCellGroup* and in *secondaryCellGroup*. Network only configures at most one of *reportUplinkTxDirectCurrent, reportUplinkTxDirectCurrentTwoCarrier* or *reportUplinkTxDirectCurrentMoreCarrier* in one RRC message*.*

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

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

3> if the *RRCReconfiguration* message is applied due to conditional reconfiguration execution and the *RRCReconfiguration* message does not include the *reconfigurationWithSync* in the *masterCellGroup*:

4> include in the *selectedCondRRCReconfig* the *condReconfigId* for the selected cell of conditional reconfiguration execution;

4> if a new *sk-Counter* value has been selected due to the conditional reconfiguration execution for subsequent CPAC:

5> include *selectedSK-Counter* and set its value to the selected *sk-Counter* value;

3> if the *RRCReconfiguration* message is applied due to conditional reconfiguration execution and *condExecutionCondPSCell* is configured for the selected PSCell:

4> include in the *selectedPSCellForCHO-WithSCG* and set it to the information of the selected PSCell;

2> if the *RRCReconfiguration* includes the *reconfigurationWithSync* in *spCellConfig* of an MCG:

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

3> if the UE has logged measurements available for NR and if the current registered SNPN identity is included in *snpn-ConfigID-List* stored in the *VarLogMeasReport*:

4> include the *logMeasAvailable* in the *RRCReconfigurationComplete* message;

4> if Bluetooth measurement results are included in the logged measurements the UE has available for NR:

5> include the *logMeasAvailableBT* in the *RRCReconfigurationComplete* message;

4> if WLAN measurement results are included in the logged measurements the UE has available for NR:

5> include the *logMeasAvailableWLAN* in the *RRCReconfigurationComplete* message;

3> if the *sigLoggedMeasType* in *VarLogMeasReport* is included; or

3> if the UE supports the override protection of the signalling based logged MDT for inter-RAT (i.e. LTE to NR), and if the *sigLoggedMeasType* in *VarLogMeasReport* of TS 36.331 [10] is included:

4> if T330 timer is running (associated to the logged measurement configuration for NR or for LTE):

5> set *sigLogMeasConfigAvailable* to *true* in the *RRCReconfigurationComplete* message;

4> else:

5> if the UE has logged measurements in *VarLogMeasReport* or in *VarLogMeasReport* of TS 36.331 [10]:

6> set *sigLogMeasConfigAvailable* to *false* in the *RRCReconfigurationComplete* message;

3> if the UE has connection establishment failure or connection resume failure information available in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport* orin at least one of the entries of *VarConnEstFailReportList*; or

3> if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the registered SNPN identity is equal to *snpn-Identity* in *networkIdentity* stored in *VarConnEstFailReport* or any entry of *VarConnEstFailReportList*:

4> include *connEstFailInfoAvailable* in the *RRCReconfigurationComplete* message;

3> 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*; or

3> 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]; or

3> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in *VarRLF-Report*:

4> include *rlf-InfoAvailable* in the *RRCReconfigurationComplete* message;

3> if the UE was configured with *successHO-Config* when connected to the source PCell:

4> if the applied *RRCReconfiguration* is not due to a conditional reconfiguration execution upon cell selection performed while timer T311 was running, as defined in 5.3.7.3 and the applied *RRCReconfiguration* is not due to an LTM cell switch execution upon cell selection performed while timer T311 was running, as defined in 5.3.7.3; or

4> if the applied *RRCReconfiguration* is not received when T316 was running:

5> perform the actions for the successful handover report determination as specified in clause 5.7.10.6, upon successfully completing the Random Access procedure triggered for the *reconfigurationWithSync* in *spCellConfig* of the MCG, or upon an indication from lower layer that the LTM cell switch execution has been successfully completed;4> if applied *RRCReconfiguration* is received when T316 was running:

5> release *successHO-Config* configured by the source PCell and *thresholdPercentageT304* if configured by the target PCell;3> if the UE has successful handover information available in *VarSuccessHO-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarSuccessHO-Report*; or

3> if the UE has successful handover information available in *VarSuccessHO-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in the *VarSuccessHO-Report*:

4> include *successHO-InfoAvailable* in the *RRCReconfigurationComplete* message;

Editor’s note: For RACH-less LTM cell switch in MCG, the LTM cell switch execution is considered as successfully completed when successfully sending *RRCReconfigurationComplete* message, thus UE can not determine the *successHO-InfoAvailable* in this *RRCReconfigurationComplete* message. FFS whether and how to fix this.

3> release *successPSCell-Config* configured by the source PCell, if available;

3> if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarSuccessPSCell-Report*; or

3> if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in the *VarSuccessPSCell-Report*:

4> include *successPSCell-InfoAvailable* in the *RRCReconfigurationComplete* message;

2> if the *RRCReconfiguration* message was received via SRB1, but not within *mrdc-SecondaryCellGroup* or E-UTRA *RRCConnectionReconfiguration* or E-UTRA *RRCConnectionResume*:

3> if the UE is configured to provide the measurement gap requirement information of NR target bands:

4> if the *RRCReconfiguration* message includes the *needForGapsConfigNR*; or

4> if the *NeedForGapsInfoNR* information is changed compared to last time the UE reported this information; or

4> if the *RRCReconfiguration* message includes the *needForInterruptionConfigNR* and set it to *enabled*; or

4> if the *needForInterruptionConfigNR* is enabled and the *NeedForInterruptionInfoNR* information is changed compared to last time the UE reported this information:

5> include the *NeedForGapsInfoNR* and set the contents as follows:

6> include *intraFreq-needForGap* and set the gap requirement information of intra-frequency measurement for each NR serving cell;

6> if *requestedTargetBandFilterNR* is configured:

7> for each supported NR band that is also included in *requestedTargetBandFilterNR*, include an entry in *interFreq-needForGap* and set the gap requirement information for that band;

6> else:

7> include an entry in *interFreq-needForGap* and set the corresponding gap requirement information for each supported NR band;

5> if the *needForInterruptionConfigNR* is enabled:

6> include the *needForInterruptionInfoNR* and set the contents as follows:

7> include *intraFreq-needForInterruption* with the same number of entries, and listed in the same order, as in *intraFreq-needForGap*;

7> for each entry in *intraFreq-needForInterruption*:

8> include *interruptionIndication* and set the interruption requirement information if the corresponding entry in *intraFreq-needForGap* is set to *no-gap;*

7> include *interFreq-needForInterruption* with the same number of entries, and listed in the same order, as in *interFreq-needForGap*;

7> for each entry in *interFreq-needForInterruption*:

8> include *interruptionIndication* and set the interruption requirement information if the corresponding entry in *interFreq-needForGap* is set to *no-gap*;

3> if the UE is configured to provide the measurement gap and NCSG requirement information of NR target bands:

4> if the *RRCReconfiguration* message includes the *needForGapNCSG-ConfigNR*; or

4> if the *needForGapNCSG-InfoNR* information is changed compared to last time the UE reported this information:

5> include the *NeedForGapNCSG-InfoNR* and set the contents as follows:

6> include *intraFreq-needForNCSG* and set the gap and NCSG requirement information of intra-frequency measurement for each NR serving cell;

6> if *requestedTargetBandFilterNCSG-NR* is configured:

7> for each supported NR band included in *requestedTargetBandFilterNCSG-NR*, include an entry in *interFreq-needForNCSG* and set the NCSG requirement information for that band;

6> else:

7> include an entry for each supported NR band in *interFreq-needForNCSG* and set the corresponding NCSG requirement information;

3> if the UE is configured to provide the measurement gap and NCSG requirement information of E‑UTRA target bands:

4> if the *RRCReconfiguration* message includes the *needForGapNCSG-ConfigEUTRA*; or

4> if the *needForGapNCSG-InfoEUTRA* information is changed compared to last time the UE reported this information:

5> include the *NeedForGapNCSG-InfoEUTRA* and set the contents as follows:

6> if *requestedTargetBandFilterNCSG-EUTRA* is configured, for each supported E-UTRA band included in *requestedTargetBandFilterNCSG-EUTRA*, include an entry in *needForNCSG-EUTRA* and set the NCSG requirement information for that band; otherwise, include an entry for each supported E-UTRA band in *needForNCSG-EUTRA* and set the corresponding NCSG requirement information;

2> if the UE has (updated) flight path information available:

3> if the UE had not provided a flight path information since last entering RRC\_CONNECTED state; or

3> if at least one waypoint or a timestamp corresponding to a waypoint location that was not previously provided since last entering RRC\_CONNECTED state is available; or

3> if at least one upcoming waypoint or a timestamp corresponding to a waypoint location that was previously provided since last entering RRC\_CONNECTED state is to be removed; or

3> if *flightPathUpdateDistanceThr* is configured and, for at least one waypoint, the 3D distance between the previously provided location and the new location is more than the distance threshold configured by *flightPathUpdateDistanceThr*; or

3> if *flightPathUpdateTimeThr* is configured and, for at least one waypoint, the time difference between the previously provided timestamp and the new timestamp, if available, is more than the time threshold configured by *flightPathUpdateTimeThr*:

4> include *flightPathInfoAvailable*;

NOTE 0c: If neither *flightPathUpdateDistanceThr* nor *flightPathUpdateTimeThr* is configured, it is up to UE implementation whether to include *flightPathInfoAvailable* when updated flight path information is available.

2> if the UE has at least one stored application layer measurement configuration with *appLayerIdleInactiveConfig* configured which has not been successfully transmitted since entering RRC\_CONNECTED state:

3> include *measConfigReportAppLayerAvailable*;

2> if this *RRCReconfiguration* message is applied due to an LTM cell switch execution procedure according to clause 5.3.5.18.6:

3> include in the *appliedLTM-CandidateId* the *LTM-CandidateId* of the applied LTM candidate configuration;

1> if the UE is configured with E-UTRA *nr-SecondaryCellGroupConfig* (UE in (NG)EN-DC):

2> if the *RRCReconfiguration* message was received via E-UTRA SRB1 as specified in TS 36.331 [10]; or

2> if the *RRCReconfiguration* message was received via E-UTRA RRC message *RRCConnectionReconfiguration* within *MobilityFromNRCommand* (handover from NR standalone to (NG)EN-DC);

3> if the *RRCReconfiguration* is applied due to a conditional reconfiguration execution for CPC which is configured via *conditionalReconfiguration* contained in *nr-SecondaryCellGroupConfig* specified in TS 36.331 [10]:

4> submit the *RRCReconfigurationComplete* message via the E-UTRA MCG embedded in E-UTRA RRC message *ULInformationTransferMRDC* as specified in TS 36.331 [10], clause 5.6.2a.

3> else if the *RRCReconfiguration* message was included in E-UTRA *RRCConnectionResume* message:

4> submit the *RRCReconfigurationComplete* message via E-UTRA embedded in E-UTRA RRC message *RRCConnectionResumeComplete* as specified in TS 36.331 [10], clause 5.3.3.4a;

3> else:

4> submit the *RRCReconfigurationComplete* via E-UTRA embedded in E-UTRA RRC message *RRCConnectionReconfigurationComplete* as specified in TS 36.331 [10], clause 5.3.5.3/5.3.5.4/5.4.2.3;

3> if the *scg-State* is not included in the E-UTRA message (*RRCConnectionReconfiguration* or *RRCConnectionResume*) containing the *RRCReconfiguration* message:

4> perform SCG activation as specified in 5.3.5.13a;

4> if *reconfigurationWithSync* was included in *spCellConfig* of an SCG:

5> initiate the Random Access procedure on the PSCell, as specified in TS 38.321 [3];

4> else if the SCG was deactivated before the reception of the E-UTRA RRC message containing the *RRCReconfiguration* message:

5> if *bfd-and-RLM* was not configured to *true* before the reception of the E-UTRA *RRCConnectionReconfiguration* or *RRCConnectionResume* message containing the *RRCReconfiguration* message or if lower layers indicate that a Random Access procedure is needed for SCG activation:

6> initiate the Random Access procedure on the SpCell, as specified in TS 38.321 [3];

5> else the procedure ends;

4> else the procedure ends;

3> else:

4> perform SCG deactivation as specified in 5.3.5.13b;

4> the procedure ends;

2> if the *RRCReconfiguration* message was received within *nr-SecondaryCellGroupConfig* in *RRCConnectionReconfiguration* message received via SRB3 within *DLInformationTransferMRDC*:

3> submit the *RRCReconfigurationComplete* via E-UTRA embedded in E-UTRA RRC message *RRCConnectionReconfigurationComplete* as specified in TS 36.331 [10], clause 5.3.5.3/5.3.5.4;

3> if the *scg-State* is not included in the *RRCConnectionReconfiguration*:

4> if *reconfigurationWithSync* was included in *spCellConfig* of an SCG:

5> initiate the Random Access procedure on the SpCell, as specified in TS 38.321 [3];

4> else the procedure ends;

3> else:

4> perform SCG deactivation as specified in 5.3.5.13b;

4> the procedure ends;

NOTE 1: The order the UE sends the *RRCConnectionReconfigurationComplete* message and performs the Random Access procedure towards the SCG is left to UE implementation.

2> else (*RRCReconfiguration* was received via SRB3) but not within *DLInformationTransferMRDC*:

3> submit the *RRCReconfigurationComplete* message via SRB3 to lower layers for transmission using the new configuration;

NOTE 2: In (NG)EN-DC and NR-DC, in the case *RRCReconfiguration* is received via SRB1 or within *DLInformationTransferMRDC* via SRB3, the random access is triggered by RRC layer itself as there is not necessarily other UL transmission. In the case *RRCReconfiguration* is received via SRB3 but not within *DLInformationTransferMRDC*, the random access is triggered by the MAC layer due to arrival of *RRCReconfigurationComplete*.

1> else if the *RRCReconfiguration* message was received via SRB1 within the *nr-SCG* within *mrdc-SecondaryCellGroup* (UE in NR-DC, *mrdc-SecondaryCellGroup* was received in *RRCReconfiguration* or *RRCResume* via SRB1):

2> if the *RRCReconfiguration* is applied due to a conditional reconfiguration execution for CPC or subsequent CPAC which is configured via *conditionalReconfiguration* contained in *nr-SCG* within *mrdc-SecondaryCellGroup*; or

2> if the *RRCReconfiguration* is applied due to an LTM cell switch execution:

3> submit the *RRCReconfigurationComplete* message via *SRB1* embedded in NR RRC message *ULInformationTransferMRDC* as specified in clause 5.7.2a.3.

2> if the *scg-State* is not included in the *RRCReconfiguration* or *RRCResume* message containing the *RRCReconfiguration* message:

3> perform SCG activation as specified in 5.3.5.13a;

3> if *reconfigurationWithSync* was included in *spCellConfig* in nr-SCG:

4> if the *RRCReconfiguration* message is not applied due to an LTM cell switch execution for which lower layer indicate to skip the Random Access procedure:

5> initiate the Random Access procedure on the PSCell, as specified in TS 38.321 [3];

4> if the UE was configured with *successPSCell-Config* when connected to the source PSCell (for PSCell change) or to the PCell (for PSCell addition or change):

5> perform the actions for the successful PSCell change or addition report determination as specified in clause 5.7.10.7, upon successfully completing the Random Access procedure triggered for the *reconfigurationWithSync* in *spCellConfig* of the SCG;

3> else if the SCG was deactivated before the reception of the NR RRC message containing the *RRCReconfiguration* message:

4> if *bfd-and-RLM* was not configured to *true* before the reception of the *RRCReconfiguration* or *RRCResume* message containing the *RRCReconfiguration* message; or

4> if lower layers indicate that a Random Access procedure is needed for SCG activation:

5> initiate the Random Access procedure on the PSCell, as specified in TS 38.321 [3];

4> else the procedure ends;

3> else the procedure ends;

2> else

3> perform SCG deactivation as specified in 5.3.5.13b;

3> the procedure ends;

NOTE 2a: The order in which the UE sends the *RRCReconfigurationComplete* message and performs the Random Access procedure towards the SCG is left to UE implementation.

1> else if the *RRCReconfiguration* message was received via SRB3 (UE in NR-DC):

2> if the *RRCReconfiguration* message was received within *DLInformationTransferMRDC*:

3> if the *RRCReconfiguration* message was received within the *nr-SCG* within *mrdc-SecondaryCellGroup* (NR SCG RRC Reconfiguration):

4> if the *scg-State* is not included in the *RRCReconfiguration* message containing the *RRCReconfiguration* message:

5> if *reconfigurationWithSync* was included in spCellConfig in nr-SCG:

6> initiate the Random Access procedure on the PSCell, as specified in TS 38.321 [3];

6> if the UE was configured with *successPSCell-Config* when connected to the source PSCell (for PSCell change) or to the PCell (for PSCell addition or change):

7> perform the actions for the successful PSCell change report determination as specified in clause 5.7.10.7, upon successfully completing the Random Access procedure triggered for the *reconfigurationWithSync* in *spCellConfig* of the SCG;

5> else:

6> the procedure ends;

4> else:

5> perform SCG deactivation as specified in 5.3.5.13b;

5> the procedure ends;

3> else:

4> if the *RRCReconfiguration* does not include the *mrdc-SecondaryCellGroupConfig*:

5> if the *RRCReconfiguration* includes the *scg-State*:

6> perform SCG deactivation as specified in 5.3.5.13b;

4> submit the *RRCReconfigurationComplete* message via SRB1 to lower layers for transmission using the new configuration;

2> else:

3> if the *RRCReconfiguration* includes the *reconfigurationWithSync* in *spCellConfig* for the SCG; and

3> if the UE was configured with *successPSCell-Config* when connected to the source PSCell (for PSCell change) or to the PCell (for PSCell addition or change):

4> perform the actions for the successful PSCell change report determination as specified in clause 5.7.10.7, upon successfully completing the Random Access procedure triggered for the *reconfigurationWithSync* in *spCellConfig* of the SCG;

3> if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarSuccessPSCell-Report*; or

3> if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in the *VarSuccessPSCell-Report*:

4> include *successPSCell-InfoAvailable* in the *RRCReconfigurationComplete* message;

3> submit the *RRCReconfigurationComplete* message via SRB3 to lower layers for transmission using the new configuration;

1> else(*RRCReconfiguration* was received via SRB1):

2> if the UE is in NR-DC and;

2> if the *RRCReconfiguration* does not include the *mrdc-SecondaryCellGroupConfig*:

3> if the *RRCReconfiguration* includes the *scg-State*:

4> perform SCG deactivation as specified in 5.3.5.13b;

3> else:

4> perform SCG activation without SN message as specified in 5.3.5.13b1;

2> if the *reconfigurationWithSync* was included in *spCellConfig* of an MCG:

3> if *ta-Report* or *ta-ReportATG* is configured with value *enabled* and the UE supports TA reporting:

4> indicate TA report initiation to lower layers;

2> submit the *RRCReconfigurationComplete* message via SRB1 to lower layers for transmission using the new configuration;

2> if this is the first *RRCReconfiguration* message after successful completion of the RRC re-establishment procedure:

3> resume SRB2, SRB4, DRBs, multicast MRB, and BH RLC channels for IAB-MT, and Uu Relay RLC channels for L2 U2N Relay UE, that are suspended;

1> if *sl-IndirectPathAddChange* was included in *RRCReconfiguration* message:

2> if SRB1 is configured as split SRB and *pdcp-Duplication* is configured:

3> when successfully sending *RRCReconfigurationComplete* message via SL indirect path (i.e., PC5 RLC acknowledgement is received from target L2 U2N Relay UE):

4> stop timer T421;

2> else (i.e. split SRB1 with duplication is not configured):

3> when receiving *RRCReconfigurationCompleteSidelink* message from target L2 U2N Relay UE:

4> stop timer T421;

1> if *reconfigurationWithSync* was included in *spCellConfig* of an MCG or SCG and when MAC of an NR cell group successfully completes a Random Access procedure triggered above; or,

1> if *sl-PathSwitchConfig* was included in *reconfigurationWithSync* included in *spCellConfig* of an MCG, and when successfully sending *RRCReconfigurationComplete* message (i.e., PC5 RLC acknowledgement is received from target L2 U2N Relay UE); or,

1> if *rach-LessHO* was included in *reconfigurationWithSync* included in *spCellConfig* of an MCG, and upon indication from lower layers that the RACH-less handover has been successfully completed; or,

1> if *reconfigurationWithSync* was included in *spCellConfig* of an MCG or SCG and the *RRCReconfiguration* message is applied due to an LTM cell switch execution and upon an indication from lower layer that the LTM cell switch execution has been successfully completed:

2> stop timer T304 for that cell group if running;

2> if *sl-PathSwitchConfig* was included in *reconfigurationWithSync*:

3> if the *sl-IndirectPathMaintain* is not included in *reconfigurationWithSync*:

4> stop timer T420;

4> release all radio resources, including release of the RLC entities and the MAC configuration at the source side;

4> reset MAC used in the source cell;

3> else (*sl-IndirectPathMaintain* is included):

4> release radio resources on the direct path, including release of the RLC entities and the MAC configuration;

4> reset MAC used in the source cell;

2> if *rach-LessHO* was included in *reconfigurationWithSync* and *cg-RRC-Configuration* was configured:

3> release the uplink grant configured for RACH-less handover;

NOTE 2b: PDCP and SDAP configured by the source prior to the path switch that are reconfigured and re-used by target when delta signalling is used, are not released as part of this procedure.

2> stop timer T310 for source SpCell if running;

2> apply the parts of the CSI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the respective target SpCell, if any;

2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the respective target SpCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of that target SpCell;

2> for each DRB configured as DAPS bearer, request uplink data switching to the PDCP entity, as specified in TS 38.323 [5];

2> if the *reconfigurationWithSync* was included in *spCellConfig* of an MCG:

3> if T390 is running:

4> stop timer T390 for all access categories;

4> perform the actions as specified in 5.3.14.4.

3> if T350 is running:

4> stop timer T350;

3> if *RRCReconfiguration* does not include *dedicatedSIB1-Delivery* and

3> if the active downlink BWP, which is indicated by the *firstActiveDownlinkBWP-Id* for the target SpCell of the MCG, has a common search space configured by *searchSpaceSIB1*:

4> acquire the *SIB1*, which is scheduled as specified in TS 38.213 [13], of the target SpCell of the MCG;

4> upon acquiring *SIB1*, perform the actions specified in clause 5.2.2.4.2;

2> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution and the *RRCReconfiguration* message is contained in an entry in MCG *VarConditionalReconfig* that includes the *subsequentCondReconfig*:

3> for each entry in the *condReconfigList* within the MCG *VarConditionalReconfig*:

4> if there is an entry in *condExecutionCondToAddModList* within the *subsequentCondReconfig* that has *subsequentCondReconfigId* matching the *condReconfigId* in the entry of the *condReconfigList*:

5> if *subsequentCondExecutionCondSCG* is included in the entry of the *condExecutionCondToAddModList*:

6> store in the *condExecutionCondSCG* in the entry of the *condReconfigList* the value of *subsequentCondExecutionCondSCG* in the entry of the *condExecutionCondToAddModList*;

2> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution and the *RRCReconfiguration* message is contained in an entry in SCG *VarConditionalReconfig* that includes the *subsequentCondReconfig*:

3> for each entry in the *condReconfigList* within the SCG *VarConditionalReconfig*:

4> if there is an entry in *condExecutionCondToAddModList* within the *subsequentCondReconfig* that has *subsequentCondReconfigId* matching the *condReconfigId* in the entry of the *condReconfigList*:

5> if *subsequentCondExecutionCond* is included in the entry of the *condExecutionCondToAddModList*:

6> store in the *condExecutionCond* in the entry of the *condReconfigList* the value of *subsequentCondExecutionCond* in the entry of the *condExecutionCondToAddModList*;

2> if the *reconfigurationWithSync* was included in *spCellConfig* of an MCG; or

2> if the *reconfigurationWithSync* was included in *spCellConfig* of an SCG and the CPA, CPC, or subsequent CPAC was configured:

3> remove all the entries in the *condReconfigList* within the MCG and the SCG *VarConditionalReconfig* except for the entries in which *subsequentCondReconfig* is present, if any;

3> remove all the entries within *VarConditionalReconfiguration* as specified in TS 36.331 [10], clause 5.3.5.9.6, if any;

3> for each *measId* of the MCG *measConfig*, if configured, and for each *measId* of the SCG *measConfig*, if configured, if the associated *reportConfig* has a *reportType* set to *condTriggerConfig*:

4> if the *reportConfigId* is not associated with any *measId* indicated by the *condExecutionCond* or the *condExecutionCondSCG* in an entry of *condReconfigList* in *VarConditionalReconfig* in which *subsequentCondReconfig* is included:

5> remove the entry with the matching *reportConfigId* from the *reportConfigList* within the *VarMeasConfig*;

4> if the associated *measObjectId* is only associated to a *reportConfig* with *reportType* set to *condTriggerConfig*; and

4> if the *measObjectId* is not associated with any *measId* indicated by the *condExecutionCond* or the *condExecutionCondSCG* in an entry of *condReconfigList* in *VarConditionalReconfig* in which *subsequentCondReconfig* is included:

5> remove the entry with the matching *measObjectId* from the *measObjectList* within the *VarMeasConfig*;

4> remove the entry with the matching *measId* from the *measIdList* within the *VarMeasConfig*;

2> if *reconfigurationWithSync* was included in *masterCellGroup* or *secondaryCellGroup*:

3> if the UE initiated transmission of a *UEAssistanceInformation* message for the corresponding cell group during the last 1 second, and the UE is still configured to provide the concerned UE assistance information for the corresponding cell group; or

3> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution or an LTM cell switch procedure, and the UE is configured to provide UE assistance information for the corresponding cell group, and the UE has initiated transmission of a *UEAssistanceInformation* message for the corresponding cell group since it was configured to do so in accordance with 5.7.4.2:

4> initiate transmission of a *UEAssistanceInformation* message for the corresponding cell group in accordance with clause 5.7.4.3 to provide the concerned UE assistance information;

4> start or restart the prohibit timer (if exists) associated with the concerned UE assistance information with the timer value set to the value in corresponding configuration;

4> start or restart the leave without response timer (if exists) or the wait timer (if exists) with the timer value set to the value in *musim-CapabilityRestrictionConfig*;

3> if *SIB12* is provided by the target PCell, and the UE initiated transmission of a *SidelinkUEInformationNR* message indicating a change of NR sidelink communication/discovery related parameters relevant in target PCell (i.e. change of *sl-RxInterestedFreqList* or *sl-TxResourceReqList*) during the last 1 second preceding reception of the *RRCReconfiguration* message including *reconfigurationWithSync* in *spCellConfig* of an MCG; or

3> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution and the UE is capable of NR sidelink communication/discovery and *SIB12* is provided by the target PCell, and the UE has initiated transmission of a *SidelinkUEInformationNR* message since it was configured to do so in accordance with 5.8.3.2:

4> initiate transmission of the *SidelinkUEInformationNR* message in accordance with 5.8.3.3;

3> if any application layer measurement report container has been received from upper layers for which the successful transmission of the *MeasurementReportAppLayer* message or at least one segment of the message via SRB4 (if *reconfigurationWithSync* was included in *masterCellGroup*) or SRB5 (if *reconfigurationWithSync* was included in *secondaryCellGroup*) has not been confirmed by lower layers:

4> if RRC segmentation was used for the *MeasurementReportAppLayer* message:

5> if RRC segmentation is enabled based on the field *rrc-SegAllowedSRB4* or *rrc-SegAllowedSRB5* for the *reportingSRB* (or SRB4 if *reportingSRB* is not configured):

6> re-submit all segments of the *MeasurementReportAppLayer* message to lower layers for transmission via the *reportingSRB* (or SRB4 if *reportingSRB* is not configured);

5> else:

6> discard all segments of the *MeasurementReportAppLayer* message;

4> else:

5> re-submit the *MeasurementReportAppLayer* message to lower layers for transmission via the *reportingSRB* (or SRB4 if *reportingSRB* is not configured);

2> if *reconfigurationWithSync* was included in *masterCellGroup* and SRB4 is configured in the target cell:

3> for each application layer measurement configuration in the UE:

4> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution, if *transmissionOfSessionStartStop* is set to *true* for the application layer measurement configuration and if the session status has changed since the UE was configured with the conditional reconfiguration:

5> initiate transmission of a *MeasurementReportAppLayer* message including *appLayerSessionStatus*, via SRB4 for the application layer measurement in accordance with 5.7.16.2;

2> if *reconfigurationWithSync* was included in *masterCellGroup* and the target cell provides *SIB21* or provides *SIB1* including *nonServingCellMII*:

3> if the UE initiated transmission of an *MBSInterestIndication*message during the last 1 second preceding reception of this *RRCReconfiguration* message; or

3> if the *RRCReconfiguration* message is applied due to a conditional reconfiguration execution, and the UE has initiated transmission of an *MBSInterestIndication* message after having received this *RRCReconfiguration* message:

4> initiate transmission of an *MBSInterestIndication*message in accordance with clause 5.9.4;

2> the procedure ends.

NOTE 3: The UE is only required to acquire broadcasted *SIB1* if the UE can acquire it without disrupting unicast or MBS multicast data reception, i.e. the broadcast and unicast/MBS multicast beams are quasi co-located.

NOTE 4: The UE sets the content of *UEAssistanceInformation* according to latest configuration (i.e. the configuration after applying the *RRCReconfiguration* message) and latest UE preference. The UE may include more than the concerned UE assistance information within the *UEAssistanceInformation* according to 5.7.4.2. Therefore, the content of *UEAssistanceInformation* message might not be the same as the content of the previous *UEAssistanceInformation* message.

NEXT CHANGE

##### 5.3.5.18.6 LTM cell switch execution

Upon the indication by lower layers that an LTM cell switch procedure is triggered, or upon performing LTM cell switch following cell selection performed while timer T311 was running, as specified in 5.3.7.3, the UE shall:

1> if the LTM cell switch is triggered on the MCG:

2> release/clear all current dedicated and common radio configurations which have neither been received via SRB1 within *mrdc-SecondaryCellGroup*, nor via SRB3 except for the following:

- the radio bearer configuration (configured via *RadioBearerConfig*)

- the *logicalChannelIdentity* and *logicalChannelIdentityExt* of RLC bearers configured in *RLC-BearerConfig* and the associated RLC entities, their state variables, buffers, and timers, except for triggering the associated RLC entities to reset the variable RETX\_COUNT its initial value, as specified in TS 38.322 [4];

- the *bh-LogicalChannelIdentity* of BH RLC channels configured in *BH-RLC-ChannelConfig* and the associated RLC entities, their state variables, buffers, and timers, except for triggering the associated RLC entities to reset the variable RETX\_COUNT its initial value, as specified in TS 38.322 [4];

- the UE variables *VarLTM-ServingCellNoResetID* and *VarLTM-ServingCellUE-MeasuredTA-ID*;

- the *ltm-Config*;

- the MCG C-RNTI;

- the AS security configurations associated with the master key;

- the logged measurement configuration;

- the *successHO-Config*;

1> else, if the LTM cell switch is triggered on the SCG:

2> release/clear all current dedicated and common radio configurations which have been received either via SRB1 within *mrdc-SecondaryCellGroup*, or via SRB3 except for the following:

- the radio bearer configuration (configured via *RadioBearerConfig* IE)

- the *logicalChannelIdentity* and *logicalChannelIdentityExt* of RLC bearers configured in *RLC-BearerConfig* and the associated RLC entities, their state variables, buffers, and timers, except for triggering the associated RLC entities to reset the variable RETX\_COUNT its initial value, as specified in TS 38.322 [4];

- the *bh-LogicalChannelIdentity* of BH RLC channels configured in *BH-RLC-ChannelConfig* and the associated RLC entities, their state variables, buffers, and timers, except for triggering the associated RLC entities to reset the variable RETX\_COUNT its initial value, as specified in TS 38.322 [4];

- the UE variables *VarLTM-ServingCellNoResetID* and *VarLTM-ServingCellUE-MeasuredTA-ID*;

- the *ltm-Config*;

- the AS security configurations associated with the secondary key;

1> for each SRB/DRB in the current UE configuration:

2> if the LTM cell switch is triggered on the MCG and the SRB/DRB using the master key; or

2> if the LTM cell switch is triggered on the SCG and the SRB/DRB using the secondary key:

3> keep the associated PDCP and SDAP entities, their state variables, buffers and timers;

3> release all fields related to the SRB/DRB configuration except for *srb-Identity* and *drb-Identity*;

1> apply the default L1 parameter values as specified in corresponding physical layer specifications except for the parameters for which values are provided in SIB1;

1> use the default values specified in 9.2.3 for timers T310, T311 and constants N310, N311 associated with the cell group for which the LTM cell switch procedure is triggered, where T310, N310, and N311 are for both MCG and SCG, and T311 is only for the MCG;

1> apply the default MAC Cell Group configuration as specified in 9.2.2 for the cell group for which the LTM cell switch procedure is triggered;

1> for each *srb-Identity* in the current UE configuration:

2> apply the default SRB configuration defined in 9.2.1 for the corresponding SRB;

1> if the *LTM-Candidate* IE in *ltm-Config* indicated by lower layers or for the selected cell in accordance with 5.3.7.3 does not contain the field *ltm-NoResetID* and if the UE does not have any value stored of *ltm-ServingCellNoResetID* within *VarLTM-ServingCellNoResetID*; or

1> if the value of field *ltm-NoResetID* contained within the *LTM-Candidate* IE in *ltm-Config* indicated by lower layers or for the selected cell in accordance with 5.3.7.3 is not equal to the value of *ltm-ServingCellNoResetID* within *VarLTM-ServingCellNoResetID*:

2> for each *logicalChannelIdentity* and *logicalChannelIdentityExt* that is part of the current UE configuration for the cell group for which the LTM cell switch procedure is triggered:

3> if *servedRadioBearer* is set to *drb-Identity*:

4> after the end of this procedure, re-establish the corresponding RLC entity as specified in TS 38.322 [4], after applying the LTM configuration in *ltm-CandidateConfig* within the *LTM-Candidate* IE in *ltm-Config*;

2> for each *bh-LogicalChannelIdentity* that is part of the current UE configuration for the cell group for which the LTM cell switch procedure is triggered:

3> after the end of this procedure, re-establish the corresponding RLC entity as specified in TS 38.322 [4], after applying the LTM configuration in *ltm-CandidateConfig* within the LTM-Candidate IE in *ltm-Config*;

2> for each *drb-Identity* value that is part of the current UE configuration:

3> if this DRB is an AM DRB:

4> after the end of this procedure, trigger the PDCP entity of this DRB to perform data recovery as specified in TS 38.323 [5], after applying the LTM configuration in *ltm-CandidateConfig* within *LTM-Candidate* IE in *ltm-Config*;

2> if the value of field *ltm-NoResetID* contained within the *LTM-Candidate* IE in *ltm-Config* indicated by lower layers or for the selected cell in accordance with 5.3.7.3 is not equal to the value of *ltm-ServingCellNoResetID* within *VarLTM-ServingCellNoResetID*:

3> replace the value of *ltm-ServingCellNoResetID* in *VarLTM-ServingCellNoResetID* with the value of *ltm-NoResetID* in the *LTM-Candidate* in *ltm-Config* indicated by lower layers or for the selected cell in accordance with 5.3.7.3;

1> if the *LTM-Candidate* IE in *ltm-Config* indicated by lower layers or for the selected cell in accordance with 5.3.7.3 contains the field *ltm-UE-MeasuredTA-ID*:

2> if the value of *ltm-UE-MeasuredTA-ID* is not equal to the value of *ltm-ServingCellUE-MeasuredTA-ID* within *VarLTM-ServingCellUE-MeasuredTA-ID*:

3> replace the value of *ltm-ServingCellUE-MeasuredTA-ID* in *VarLTM-ServingCellUE-MeasuredTA-ID* with the value received within *ltm-UE-MeasuredTA-ID*;

3> for each *LTM-Candidate* IE in *ltm-Config*:

4> if the value of *ltm-UE-MeasuredTA-ID* within *LTM-Candidate* IE is equal to the value of *ltm-ServingCellUE-MeasuredTA-ID* within *VarLTM-ServingCellUE-MeasuredTA-ID*:

5> inform lower layers that the UE is configured with UE-based TA measurements for the *LTM-Candidate*;

4> else:

5> inform lower layers that the UE is not configured with UE-based TA measurements for the *LTM-Candidate*;

NOTE 0: The UE is not expected to perform UE-based TA measurements for an SpCell.

1> else if the *LTM-Candidate* IE in *ltm-Config* indicated by lower layers or for the selected cell in accordance with 5.3.7.3 does not contain the field *ltm-UE-MeasuredTA-ID*:

2> inform lower layers that the UE is not configured with UE-based TA measurements for the *LTM-Candidate*.

1> if *ltm-ConfigComplete* is not included within the *LTM-Candidate* IE in *ltm-Config* indicated by lower layers or for the selected cell in accordance with 5.3.7.3:

2> consider *ltm-ReferenceConfiguration* in *ltm-Config*, associated with the cell group for which the LTM cell switch procedure is triggered, to be the current UE configuration for the fields and configurations to be released by the actions above in this procedure;

2> if *measConfig* is included within *ltm-ReferenceConfiguration* in *ltm-Config*;

3> perform the measurement configuration procedure as specified in clause 5.5.2 by considering the *measConfig* within *ltm-ReferenceConfiguration* in *ltm-Config* as the received *measConfig*:

NOTE 1: When the UE considers the reference configuration to be the current UE configuration, the UE should store fields and configurations that are part of the reference configuration but should not execute any actions or procedures triggered by the reception of an *RRCReconfiguration* message which are described in clause 5.3.5.3, unless specified otherwise in this clause.

1> if the LTM cell switch is triggered by an indication from lower layers:

2> apply the *RRCReconfiguration* message in *ltm-CandidateConfig* within *LTM-Candidate* IE in *ltm-Config* identified by the LTM candidate configuration identity received from lower layers according to clause 5.3.5.3;

1> else (LTM cell switch triggered upon cell selection performed while timer T311 was running):

2> apply the *RRCReconfiguration* message in *ltm-CandidateConfig* within *LTM-Candidate* IE in *ltm-Config* related to the LTM candidate configuration identity for the selected cell (i.e., in accordance with 5.3.7.3) according to clause 5.3.5.3;

1> release the radio bearer(s) and the logical channel(s) that were part of the UE configuration before of this LTM cell switch procedure but not part of the LTM candidate configuration either indicated by lower layers or for the selected cell in accordance with 5.3.7.3, or the LTM reference configuration (in case the LTM candidate configuration does not include *ltm-ConfigComplete*).

NOTE 2: When *ltm-ConfigComplete* is not included for an LTM candidate configuration, before an LTM cell switch is triggered a UE implementation may generate and store an *RRCReconfiguration* message by applying the received LTM candidate configuration on top of the LTM reference configuration, and the stored *RRCReconfiguration* message is applied when the LTM cell switch is triggered. It is up to the UE to ensure that the RRC reconfiguration applied at the time of LTM cell switch is in accordance with the latest LTM reference configuration and LTM candidate configuration.

NEXT CHANGE

#### 5.3.7.3 Actions following cell selection while T311 is running

Upon selecting a suitable NR cell, the UE shall:

1> ensure having valid and up to date essential system information as specified in clause 5.2.2.2;

1> stop timer T311;

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> stop the relay (re)selection procedure, if ongoing;

1> if the cell selection is triggered by detecting radio link failure of the MCG or re-configuration with sync failure of the MCG, except for an LTM cell switch procedure following cell selection performed while timer T311 was running, as specified in 5.3.7.3, or mobility from NR failure, and

1> if *attemptCondReconfig* is configured; and

1> if the selected cell is not configured with *CondEventT1*, or the selected cell is configured with *CondEventT1* and leaving condition has not been fulfilled; and

1> if the selected cell is one of the candidate cells for which the *reconfigurationWithSync* is included in the *masterCellGroup* in the MCG *VarConditionalReconfig* and the *condExecutionCondPSCell* is not configured for the corresponding *condReconfigId* in the MCG *VarConditionalReconfig*:

2> if the UE supports RLF-Report for conditional handover, set the *choCellId* in the *VarRLF-Report* to the global cell identity, if available, otherwise to the physical cell identity and carrier frequency of the selected cell;

2> apply the stored *condRRCReconfig* associated to the selected cell and perform actions as specified in 5.3.5.3;

NOTE 1: It is left to network implementation to how to avoid keystream reuse in case of CHO based recovery after a failed handover without key change.

1> if the cell selection is triggered by detecting radio link failure of the MCG or re-configuration with sync failure of the MCG for an LTM cell switch procedure triggered upon the indication by lower layers as specified in clause 5.3.5.18.6; and

1> if *attemptLTM-Switch* is configured; and

1> if the selected cell is one of the LTM candidate cells in the *LTM-Candidate* IE within *ltm-Config* associated with the MCG:

2> if the UE supports RLF-Report for LTM, set the *ltm-RecoveryCellId* in the *VarRLF-Report* to the global cell identity, if available, otherwise to the physical cell identity and carrier frequency of the selected cell;

2> perform the LTM cell switch procedure for the selected LTM candidate cell according to the actions specified in 5.3.5.18.6;

NOTE 2: In case both *attemptCondReconfig* and *attemptLTM-Switch* are configured, it is left to the UE implementation which procedure to execute.

1> else:

2> if UE is configured with *attemptCondReconfig*;or

2> if UE is configured with *attemptLTM-Switch*:

3> reset MAC;

3> release *spCellConfig*, if configured;

3> release the MCG SCell(s), if configured;

3> release *delayBudgetReportingConfig*, if configured and stop timer T342, if running;

3> release *overheatingAssistanceConfig* , if configured and stop timer T345, if running;

3> if MR-DC is configured:

4> perform MR-DC release, as specified in clause 5.3.5.10;

3> release *idc-AssistanceConfig*, if configured;

3> release *btNameList*, if configured;

3> release *wlanNameList*, if configured;

3> release *sensorNameList*, if configured;

3> release *drx-PreferenceConfig* for the MCG, if configured and stop timer T346a associated with the MCG, if running;

3> release *maxBW-PreferenceConfig* for the MCG, if configured and stop timer T346b associated with the MCG, if running;

3> release *maxCC-PreferenceConfig* for the MCG, if configured and stop timer T346c associated with the MCG, if running;

3> release *maxMIMO-LayerPreferenceConfig* for the MCG, if configured and stop timer T346d associated with the MCG, if running;

3> release *minSchedulingOffsetPreferenceConfig* for the MCG, if configured and stop timer T346e associated with the MCG, if running;

3> release *rlm-RelaxationReportingConfig* for the MCG, if configured and stop timer T346j associated with the MCG, if running;

3> release *bfd-RelaxationReportingConfig* for the MCG, if configured and stop timer T346k associated with the MCG, if running;

3> release *releasePreferenceConfig*, if configured and stop timer T346f, if running;

3> release *onDemandSIB-Request* if configured, and stop timer T350, if running;

3> release referenceTimePreferenceReporting, if configured;

3> release *sl-AssistanceConfigNR*, if configured;

3> release *obtainCommonLocation*, if configured;

3> release *scg-DeactivationPreferenceConfig*, if configured, and stop timer T346i, if running;

3> release *musim-GapAssistanceConfig*, if configured and stop timer T346h, if running;

3> release *musim-GapPriorityAssistanceConfig*, if configured;

3> release *musim-LeaveAssistanceConfig*, if configured;

3> release *musim-CapabilityRestrictionConfig*, if configured and stop timer T346n, if running;

3> release *propDelayDiffReportConfig*, if configured;

3> release *ul-GapFR2-PreferenceConfig*, if configured;

3> release *rrm-MeasRelaxationReportingConfig*, if configured;

3> release *maxBW-PreferenceConfigFR2-2*, if configured;

3> release *maxMIMO-LayerPreferenceConfigFR2-2*, if configured;

3> release *minSchedulingOffsetPreferenceConfigExt*, if configured;

3> release *aerial-FlightPathAvailabilityConfig*, if configured;

3> release *ul-TrafficInfoReportingConfig*, if configured, and stop all instances of timer T346l, if running;

3> suspend all RBs, and BH RLC channels for the IAB-MT, except SRB0 and broadcast MRBs;

2> remove all the entries within the MCG *VarConditionalReconfig*, if any;

2> perform the LTM configuration release procedure for the MCG and the SCG as specified in clause 5.3.5.18.7;

2> for each *measId*, if the associated *reportConfig* has a *reportType* set to *condTriggerConfig*:

3> for the associated *reportConfigId*:

4> remove the entry with the matching *reportConfigId* from the *reportConfigList* within the *VarMeasConfig*;

3> if the associated *measObjectId* is only associated to a *reportConfig* with *reportType* set to *condTriggerConfig*:

4> remove the entry with the matching *measObjectId* from the *measObjectList* within the *VarMeasConfig*;

3> remove the entry with the matching *measId* from the *measIdList* within the *VarMeasConfig*;

2> remove the *servingSecurityCellSetId* within the *VarServingSecurityCellSetID*, if any;

2> release the PC5 RLC entity for SL-RLC0, if any;

2> start timer T301;

2> apply the default L1 parameter values as specified in corresponding physical layer specifications except for the parameters for which values are provided in *SIB1*;

2> apply the default MAC Cell Group configuration as specified in 9.2.2;

2> apply the CCCH configuration as specified in 9.1.1.2;

2> apply the *timeAlignmentTimerCommon* included in *SIB1*;

2> initiate transmission of the *RRCReestablishmentRequest* message in accordance with 5.3.7.4;

NOTE 2a: This procedure applies also if the UE returns to the source PCell.

NOTE 3: A L2 U2N Relay UE may re-establish (e.g. via release and establish) the SL-RLC0 and SL-RLC1 of the connected L2 U2N Remote UE(s).

Upon selecting an inter-RAT cell, the UE shall:

1> perform the actions upon going to RRC\_IDLE as specified in 5.3.11, with release cause 'RRC connection failure'.

NEXT CHANGE

#### 5.3.10.5 RLF report content determination

The UE shall determine the content in the *VarRLF-Report* as follows:

1> clear the information included in *VarRLF-Report*, if any;

1> if the UE is not in SNPN access mode, set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. including the RPLMN);

1> else if the UE is in SNPN access mode, set the *snpn-IdentityList* to include the list of equivalent SNPNs stored by the UE (i.e., including the registered SNPN identity);

1> set the *measResultLastServCell* to include the cell level RSRP, RSRQ and the available SINR, of the source PCell (in case HO failure) or PCell (in case RLF) based on the available SSB and CSI-RS measurements collected up to the moment the UE detected failure;

1> if the UE was configured with *condExecutionCond* and *condExecutionCondPScell*, set the *measResultLastServPSCell* to include the cell level RSRP, RSRQ and the available SINR, of the source PSCell (in case of PSCell change ) or PSCell (in case of no PSCell change) based on the available SSB and CSI-RS measurements collected up to the moment the UE detected the failure;

1> if t316 is not configured:

2> set *pSCellId* to the of the source PSCell (in case of PSCell change) or PSCell (in case of no PSCell change);

1> if *measRSSI-ReportConfig* is configured for the *measObject* indicated as the *servingCellMO* of the source PCell (in case HO failure) or PCell (in case of RLF), set the *measResultLastServCellRSSI* to the linear average of the available RSSI sample value(s) provided by lower layers for the frequency of the source PCell (in case HO failure) or PCell (in case of RLF) up to the moment the UE detected the failure;

1> if the SS/PBCH block-based measurement quantities are available:

2> set the *rsIndexResults* in *measResultLastServCell* to include all the available measurement quantities of the source PCell (in case HO failure) or PCell (in case RLF), ordered such that the highest SS/PBCH block RSRP is listed first if SS/PBCH block RSRP measurement results are available, otherwise the highest SS/PBCH block RSRQ is listed first if SS/PBCH block RSRQ measurement results are available, otherwise the highest SS/PBCH block SINR is listed first, based on the available SS/PBCH block based measurements collected up to the moment the UE detected failure;

2> set the *rsIndexResults* in *measResultLastServPSCell* to include all the available measurement quantities of the source PSCell (in case of PSCell change) or PSCell (in case of no PSCell change) if the UE was configured with *condExecutionCond* and *condExecutionCondPScell*, ordered such that the highest SS/PBCH block RSRP is listed first if SS/PBCH block RSRP measurement results are available, otherwise the highest SS/PBCH block RSRQ is listed first if SS/PBCH block RSRQ measurement results are available, otherwise the highest SS/PBCH block SINR is listed first, based on the available SS/PBCH block based measurements collected up to the moment the UE detected failure;

1> if the CSI-RS based measurement quantities are available:

2> set the *rsIndexResults* in *measResultLastServCell* to include all the available measurement quantities of the source PCell (in case HO failure) or PCell (in case RLF), ordered such that the highest CSI-RS RSRP is listed first if CSI-RS RSRP measurement results are available, otherwise the highest CSI-RS RSRQ is listed first if CSI-RS RSRQ measurement results are available, otherwise the highest CSI-RS SINR is listed first, based on the available CSI-RS based measurements collected up to the moment the UE detected failure;

2> if the UE was configured with *condExecutionCond* and *condExecutionCondPScell,* set the *rsIndexResults* in *measResultLastServPSCell* to include all the available measurement quantities of the source PSCell (in case of PSCell change) or PSCell (in case of no PSCell change), ordered such that the highest CSI-RS RSRP is listed first if CSI-RS RSRP measurement results are available, otherwise the highest CSI-RS RSRQ is listed first if CSI-RS RSRQ measurement results are available, otherwise the highest CSI-RS SINR is listed first, based on the available CSI-RS based measurements collected up to the moment the UE detected failure;

1> if the UE supports RLF-Report for LTM and UE is LTM configured and the SS/PBCH block-based L1 measurement quantities are available:

2> set the *resultsSSB-Indexes* in *measResultL1LastServCell* to include all the available measurement quantities of the source PCell (in case HO failure) or PCell (in case RLF), ordered such that the highest SS/PBCH block L1-RSRP is listed first, based on the available SS/PBCH block-based L1 measurements collected up to the moment the UE detected failure;

1> for each of the configured *measObjectNR* in which measurements are available:

2> if the SS/PBCH block-based measurement quantities are available:

3> set the *measResultListNR* in *measResultNeighCells* to include all the available measurement quantities of the best measured cells, other than the source PCell (in case HO failure) or PCell (in case RLF), and other than the source PSCell (in case of PSCell change) or PSCell (in case of no PSCell change), candidate PCells, and candidate PSCells if the UE was configured with *condExecutionCond* and *condExecutionCondPScell*,ordered such that the cell with highest SS/PBCH block RSRP is listed first if SS/PBCH block RSRP measurement results are available, otherwise the cell with highest SS/PBCH block RSRQ is listed first if SS/PBCH block RSRQ measurement results are available, otherwise the cell with highest SS/PBCH block SINR is listed first, based on the available SS/PBCH block based measurements collected up to the moment the UE detected failure;

4> for each neighbour cell included, include the optional fields that are available;

NOTE 0a: For the neighboring cells included in *measResultListNR* in *measResultNeighCells* ordered based on the SS/PBCH block measurement quantities, UE also includes the CSI-RS based measurement quantities, if available.

2> if the CSI-RS based measurement quantities are available:

3> set the *measResultListNR* in *measResultNeighCells* to include all the available measurement quantities of the best measured cells, other than the source PCell (in case HO failure) or PCell (in case RLF), and other than the source PSCell (in case of PSCell change failure) or PSCell (in case of no PSCell change), candidate PCells, and candidate PSCells if the UE was configured with *condExecutionCond* and *condExecutionCondPScell*, ordered such that the cell with highest CSI-RS RSRP is listed first if CSI-RS RSRP measurement results are available, otherwise the cell with highest CSI-RS RSRQ is listed first if CSI-RS RSRQ measurement results are available, otherwise the cell with highest CSI-RS SINR is listed first, based on the available CSI-RS based measurements collected up to the moment the UE detected radio link failure;

4> for each neighbour cell included, include the optional fields that are available;

NOTE 0b: For ordering the neighboring cells based on the CSI-RS measurement quantities, UE includes measurements only for the cells not yet included in *measResultListNR* in *measResultNeighCells* to avoid overriding SS/PBCH block-based ordered measurements.

2> for each neighbour cell, if any, included in *measResultListNR* in *measResultNeighCells*:

3> if the UE supports RLF-Report for conditional handover and if the neighbour cell is one of the candidate cells for which the *reconfigurationWithSync* is included in the *masterCellGroup* in the MCG *VarConditionalReconfig* at the moment of the detected failure:

4> set *choConfig* in *MeasResult2NR* to the execution condition for each *measId* within *condTriggerConfig* associated to the neighbour cell within the MCG *VarConditionalReconfig*;

4> if the first entry of *choConfig* corresponds to a fulfilled execution condition at the moment of handover failure, or radio link failure; or

4> if the second entry of *choConfig*, if available, corresponds to a fulfilled execution condition at the moment of handover failure, or radio link failure:

5> set *firstTriggeredEvent* to the execution condition *condFirstEvent* corresponding to the first entry of *choConfig* or to the execution condition *condSecondEvent* corresponding to the second entry of *choConfig*, whichever execution condition was fulfilled first in time;

5> set *timeBetweenEvents* to the elapsed time between the point in time of fulfilling the condition in *choConfig* that was fulfilled first in time, and the point in time of fulfilling the condition in *choConfig* that was fulfilled second in time, if both the first execution condition corresponding to the first entry and the second execution condition corresponding to the second entry in the *choConfig* were fulfilled;

1> if the UE has both *condExecutionCond* and *condExecutionCondPSCell* available in the MCG *VarConditionalReconfig* at the moment of the radio link failure or the handover failure, for each *ChoWithCandidateSCGInfo* in *choWithCandidateSCGInfoList*:

;

2> if all triggering conditionsof both *condExecutionCond* and *condExecutionCondPSCell* are fulfilled:

3> set *firstFulfilledConfig* to *cho* or *cpc*, whichever was fulfilled first

3> set timeBetweenFulfillment to the elapsed time between the fulfillments of the last triggering events of the two execution conditions;

2> else if all triggering conditionsof only one of the *condExecutionCond* or *condExecutionCondPSCell* are fulfilled:

3> set *firstFulfilledConfig* to *cho* or *cpc*, whichever was fulfilled

3> set *timeBetweenLastFulfillmentAndEvent* to the elapsed time between the point in time of fulfilling the last triggering event of the fulfilled execution condition and the RLF;

2> include the global cell identity and tracking area code, if available, and otherwise the physical cell identity and carrier frequency of the candidate PCell and candidate PSCell;

2> include the available measurement quantities (SS/PBCH block or CSI-RS) in the *MeasResults*;

1> if the UE supports RLF-Report for LTM, for each neighbour MCG LTM candidate cell:

2> if SS/PBCH block-based L1-RSRP measurement quantities are available:

3> set the *measResultL1NeighCells* to include all the available SS/PBCH block-based L1-RSRP measurement results of the best measured cells, other than the source PCell (in case HO failure) or PCell (in case RLF), ordered such that the cell with highest SS/PBCH block-based L1-RSRP (of all SS/PBCH block-based L1-RSRP measurement results for the cell) is listed first;

1> for each of the configured *measObjectNR* associated with neighboring cellsif the associated *reportConfigNR* includes *measRSSI-ReportConfig*:

2> set the *measResultNeighFreqRSSI* in the *measResultNeighFreqListRSSI* to the linear average of the available RSSI sample value(s) provided by lower layers for the frequencies other than the frequency of the source PCell (in case HO failure) or of the PCell (in case RLF), up to the moment the UE detected failure:

3> for each neighbour frequency included, include the optional fields that are available;

1> for each of the configured EUTRA frequencies in which measurements are available;

2> set the *measResultListEUTRA* in *measResultNeighCells* to include the best measured cells ordered such that the cell with highest RSRP is listed first if RSRP measurement results are available, otherwise the cell with highest RSRQ is listed first, and based on measurements collected up to the moment the UE detected failure;

3> for each neighbour cell included, include the optional fields that are available;

NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Exclude-listed cells are not required to be reported.

1> set the *c-RNTI* to the C-RNTI used in the source PCell (in case HO failure) or PCell (in case RLF);

1> if the failure is detected due to reconfiguration with sync failure as described in 5.3.5.8.3, set the fields in *VarRLF-report* as follows:

2> set the *connectionFailureType* to *hof*;

2> if the UE supports RLF-Report for DAPS handover and if any DAPS bearer was configured while T304 was running:

3> set *lastHO-Type* to *daps*;

3> if radio link failure was detected in the source PCell, according to clause 5.3.10.3:

4> set *timeConnSourceDAPS-Failure* to the time between the initiation of the DAPS handover execution and the radio link failure detected in the source PCell while T304 was running;

4> set the *rlf-Cause* to the trigger for detecting the source radio link failure in accordance with clause 5.3.10.4;

2> if the UE supports RLF-Report for conditional handover and if configuration of the conditional handover is available in the MCG *VarConditionalReconfig* at the moment of the handover failure:

3> if the UE executed a conditional handover toward target PCell according to the *condRRCReconfig* of the target PCell:

4> set *timeSinceCHO-Reconfig* to the time elapsed between the execution of the last *RRCReconfiguration* message including *reconfigurationWithSync* for the target PCell of the failed conditional handover, and the reception in the source PCell of the last *conditionalReconfiguration* including the *condRRCReconfig* of the target PCell of the failed conditional handover;

3> else:

4> set *timeSinceCHO-Reconfig* to the time elapsed between the execution of the last *RRCReconfiguration* message including *reconfigurationWithSync* for the target PCell of the failed handover, and the reception in the source PCell of the last *conditionalReconfiguration* including the *condRRCReconfig*;

3> set *choCandidateCellList* to include the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of each of the candidate target cells for conditional handover included in *condRRCReconfig* within the MCG *VarConditionalReconfig* at the time of the failed handover, excluding the candidate target cells included in *measResultNeighCells*;

2> if the UE supports RLF-Report for conditional handover and if the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning a conditional handover:

3> set *lastHO-Type* to *cho*;

2> else if the UE supports RLF-Report for LTM and the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning an LTM cell switch:

3> set *lastHO-Type* to *ltm*;

Editor’s note: FFS *lastHO-Type* for CHO with Candidate SCG.

2> set the *nrFailedPCellId* in *failedPCellId* to the global cell identity and tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover or a failed LTM cell switch;

2> include *nrPreviousCell* in *previousPCellId* and set it to the global cell identity and tracking area code of the PCell where the last *RRCReconfiguration* message including *reconfigurationWithSync* was received;

2> set the *timeConnFailure* to the elapsed time since the execution of the last *RRCReconfiguration* message including the *reconfigurationWithSync*;

1> else if the failure is detected due to Mobility from NR failure as described in 5.4.3.5, set the fields in *VarRLF-report* as follows:

2> set the *connectionFailureType* to *hof*;

2> if last *MobilityFromNRCommand* concerned a failed inter-RAT handover from NR to E-UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO EUTRA (NR to EUTRA):

3> set the *eutraFailedPCellId* in *failedPCellId* to the global cell identity and tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;

2> include *nrPreviousCell* in *previousPCellId* and set it to the global cell identity and tracking area code of the PCell where the last *MobilityFromNRCommand* message was received;

2> set the *timeConnFailure* to the elapsed time since the initialization of the handover associated to the last *MobilityFromNRCommand* message;

2> if the UE supports RLF report for inter-system handover for voice fallback and if *voiceFallbackIndication* is included in the last *MobilityFromNRCommand*:

3> include the v*oiceFallbackHO;*

1> else if the failure is detected due to radio link failure as described in 5.3.10.3, set the fields in *VarRLF-report* as follows:

2> set the *connectionFailureType* to *rlf*;

2> set the *rlf-Cause* to the trigger for detecting radio link failure in accordance with clause 5.3.10.4;

2> set the *nrFailedPCellId* in *failedPCellId* to the global cell identity and the tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;

2> if an *RRCReconfiguration* message including the *reconfigurationWithSync* was received before the connection failure:

3> if the last successfully executed *RRCReconfiguration* message including the *reconfigurationWithSync* concerned an intra NR handover or an LTM cell switch and the target cell of the intra NR handover or LTM cell switch was the PCell where radio link failure is detected; and

3> if T316 was not running before entering the PCell in which the radio link failure was detected; and

3> if T311 was not running before entering the PCell in which the radio link failure was detected:

4> include the *nrPreviousCell* in *previousPCellId* and set it to the global cell identity and the tracking area code of the source PCell of the intra NR handover or LTM cell switch which the last successfully executed *RRCReconfiguration* message including *reconfigurationWithSync* concerned;

4> if the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning a DAPS handover:

5> set *lastHO-Type* to *daps*;

4> else if the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning a conditional handover:

5> set *lastHO-Type* to *cho*;

4> else if the UE supports RLF-Report for LTM and the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was concerning an LTM cell switch:

5> set *lastHO-Type* to *ltm*;

4> set the *timeConnFailure* to the elapsed time since the execution of the last *RRCReconfiguration* message including the *reconfigurationWithSync*;

3> else if the last *RRCReconfiguration* message including the *reconfigurationWithSync* concerned a handover to NR from E-UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO EUTRA:

4> include the *eutraPreviousCell* in *previousPCellId* and set it to the global cell identity and the tracking area code of the E-UTRA PCell where the last *RRCReconfiguration* message including *reconfigurationWithSync* was received embedded in E-UTRA RRC message *MobilityFromEUTRACommand* message as specified in TS 36.331 [10] clause 5.4.3.3;

4> set the *timeConnFailure* to the elapsed time since reception of the last *RRCReconfiguration* message including the *reconfigurationWithSync* embedded in E-UTRA RRC message *MobilityFromEUTRACommand* message as specified in TS 36.331 [10] clause 5.4.3.3;

2> if configuration of the conditional handover is available in the MCG *VarConditionalReconfig* at the moment of declaring the radio link failure:

3> set *timeSinceCHO-Reconfig* to the time elapsed between the detection of the radio link failure, and the reception, in the source PCell, of the last *conditionalReconfiguration* including the *condRRCReconfig* message;

3> set *choCandidateCellList* to include the global cell identity if available, and otherwise to the physical cell identity and carrier frequency of each of all the candidate target cells for conditional handover included in *condRRCReconfig* within the MCG *VarConditionalReconfig* at the time of radio link failure, excluding the candidate target cells included in *measResultNeighCells*;

1> if *connectionFailureType* is *rlf* and the *rlf-Cause* is set to *randomAccessProblem* or *beamFailureRecoveryFailure*; or

1> if *connectionFailureType* is *rlf* and the *rlf-Cause* is set to *lbtFailure* and the radio link failure is detected during the random access procedure; or

1> if *connectionFailureType* is *hof* and if the failed handover is an intra-RAT handover; or

1> if *connectionFailureType* is *hof* and if the handover failure is a RACH-based LTM cell switch:

2> set the *ra-InformationCommon* to include the random-access related information as described in clause 5.7.10.5;

1> if *connectionFailureType* is *hof* and if the handover failure is a RACH-less LTM cell switch:

2> if Timing Advance Command indicated by the LTM Cell Switch Command MAC CE was applied in the failed RACH-less LTM cell switch:

3> set *timingAdvanceEstType* to *nw*;

2> else if a UE measured timing advance was applied in the failed RACH-less LTM cell switch:

3> set *timingAdvanceEstType* to *ue*;

Editor’s note: *timingAdvanceEstType* is introduced only if there is no network-based solution from RAN3.

1> if *connectionFailureType* is *rlf* and the *rlf-Cause* is set to *lbtFailure*, and the radio link failure is not detected during the random access procedure:

2> set the *locationAndBandwidth* and *subcarrierSpacing* in *bwp-Info* associated to the UL BWP in which the consistent uplink LBT failure was detected;

1> if the *rlf-Cause* is set to *t310-Expiry* or *t312-Expiry*:

2> set the *ssbRLMConfigBitmap* and/or *csi-rsRLMConfigBitmap* in *measResultLastServCell* to include the radio link monitoring configuration of the last serving cell, if available;

1> if available, set the *locationInfo* as in 5.3.3.7.

The UE may discard the radio link failure information or handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the radio link failure/handover failure is detected.

NOTE 2: In this clause, the term 'handover failure' has been used to refer to 'reconfiguration with sync failure'.

Editor’s Note: FFS impacts on the RLF-Report for LTM cell switch in case of consecutive failure, i.e if T311 was running before entering the PCell in which the radio link failure was detected.

NEXT CHANGE

#### 5.7.3.5 Actions related to transmission of *SCGFailureInformation* message

The UE shall set the contents of the *SCGFailureInformation* message as follows:

1> if the UE initiates transmission of the *SCGFailureInformation* message due to T310 expiry:

2> set the *failureType* as *t310-Expiry*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to T312 expiry:

2> set the *failureType* as *other* and set the *failureType-v1610* as *t312-Expiry*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide reconfiguration with sync failure information for an SCG:

2> set the *failureType* as *synchReconfigFailureSCG*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide random access problem indication from SCG MAC:

2> if the random access procedure was initiated for beam failure recovery:

3> set the *failureType* as *other* and set the *failureType-v1610* as *beamFailureRecoveryFailure*;

2> else:

3> set the *failureTyp*e as *randomAccessProblem*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide indication from SCG RLC that the maximum number of retransmissions has been reached:

2> set the *failureType* as *rlc-MaxNumRetx*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to SRB3 IP check failure:

2> set the *failureType* as *srb3-IntegrityFailure*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to Reconfiguration failure of NR RRC reconfiguration message:

2> set the *failureType* as *scg-reconfigFailure*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to consistent uplink LBT failures:

2> set the *failureType* as *other* and set the *failureType-v1610* as *scg-lbtFailure*;

1> else if connected as an IAB-node and the *SCGFailureInformation* is initiated due to the reception of a BH RLF indication on BAP entity from the SCG:

2> set the *failureType* as *other* and set *failureType-v1610* as *bh-RLF*;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to beam failure of the PSCell while the SCG is deactivated:

2> set the *failureType* as *other* and set *failureType-v1610* as *beamFailure;*

1> include and set *MeasResultSCG*-Failure in accordance with 5.7.3.4;

1> for each *MeasObjectNR* configured by a *MeasConfig* associated with the MCG, and for which measurement results are available:

2> include an entry in *measResultFreqList*;

2> if there is a *measId* configured with the *MeasObjectNR* and a *reportConfig* which has *rsType* set to *ssb*:

3> set *ssbFrequency* in *measResultFreqList* to the value indicated by *ssbFrequency* as included in the *MeasObjectNR*;

2> if there is a *measId* configured with the *MeasObjectNR* and a *reportConfig* which has *rsType* set to *csi-rs*:

3> set *refFreqCSI-RS* in *measResultFreqList* to the value indicated by *refFreqCSI-RS* as included in the associated measurement object;

2> if a serving cell is associated with the *MeasObjectNR*:

3> set *measResultServingCell* in *measResultFreqList* to include the available quantities of the concerned cell and in accordance with the performance requirements in TS 38.133 [14];

1> if the UE has both *condExecutionCond* and *condExecutionCondPSCell* available in the MCG *VarConditionalReconfig* at the moment of the SCG failure, for each *ChoWithCandidateSCGInfo* in *choWithCandidateSCGInfoList*:

2> if all triggering conditionsof both *condExecutionCond* and *condExecutionCondPSCell* are fulfilled:

3> set *firstFulfilledConfig* to *cho* or *cpc*, whichever was fulfilled first;

3> set timeBetweenFulfillment to the elapsed time between the fulfillments of the last triggering events of the two execution conditions;

2> else if all triggering conditionsof only one of the *condExecutionCond* or *condExecutionCondPSCell* are fulfilled:

3> set *firstFulfilledConfig* to *cho* or *cpc*, whichever was fulfilled;

3> set *timeBetweenLastFulfillmentAndEvent* to the elapsed time between the point in time of fulfilling the last triggering event of the fulfilled execution condition and the SCG failure;

2> include the global cell identity and tracking area code, if available, and otherwise the physical cell identity and carrier frequency of the candidate PCell and candidate PSCell;

2> include the available measurement quantities (SS/PBCH block or CSI-RS) in the *MeasResults*;

2> set the *measResultNeighCellList* in *measResultFreqList* to include the best measured cells, other than candidate PCells, and candidate PSCells if the UE was configured with *condExecutionCond* and *condExecutionCondPScell* ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected the failure, and set its fields as follows;

3> ordering the cells with sorting as follows:

4> based on SS/PBCH block if SS/PBCH block measurement results are available and otherwise based on CSI-RS;

4> using RSRP if RSRP measurement results are available, otherwise using RSRQ if RSRQ measurement results are available, otherwise using SINR;

3> if the UE supports SCG failure information for mobility robustness optimization for conditional PSCell change or addition, for each neighbour cell, if any, included in *measResultListNR* in *measResultFreqList*:

4> if the neighbour cell is one of the candidate cells for which the *reconfigurationWithSync* is included in the *secondaryCellGroup* in the MCG *VarConditionalReconfig* (for CPA or inter-SN CPC in NR-DC) or SCG *VarConditionalReconfig* (for intra-SN CPC) at the moment of the detected SCG failure (radio link failure at PSCell or PSCell change or addition failure):

5> if the first entry of *condExecutionCond* or *condExecutionCondSCG* associated to the neighbour cell corresponds to a fulfilled execution condition at the moment of SCG failure; or

5> if the second entry of *condExecutionCond* or *condExecutionCondSCG* associated to the neighbour cell, if available, corresponds to a fulfilled execution condition at the moment of SCG failure:

6> set *firstTriggeredEvent* to the execution condition *condFirstEvent* corresponding to the first entry of *condExecutionCond* or *condExecutionCondSCG* associated to the neighbour cell or to the execution condition *condSecondEvent* corresponding to the second entry of *condExecutionCond* or *condExecutionCondSCG* associated to the neighbour cell, whichever execution condition was fulfilled first in time;

6> set *timeBetweenEvents* to the elapsed time between the point in time of fulfilling the condition in *condExecutionCond* or *condExecutionCondSCG* associated to the neighbour cell that was fulfilled first in time, and the point in time of fulfilling the condition in *condExecutionCond* or *condExecutionCondSCG* associated to the neighbour cell that was fulfilled second in time, if both the first execution condition corresponding to the first entry and the second execution condition corresponding to the second entry in the *condExecutionCond* or *condExecutionCondSCG* associated to the neighbour cellwere fulfilled;

3> for each neighbour cell included:

4> include the optional fields that are available.

NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Exclude-listed cells are not required to be reported.

NOTE 2: Field *measResultSCG-Failure* is used to report available results for NR frequencies the UE is configured to measure by SCG RRC signalling.

1> if available, set the *locationInfo* as in 5.3.3.7 according to the *otherConfig* associated with the NR MCG.

1> if the UE supports SCG failure for mobility robustness optimization:

2> if the *failureType* is set to *synchReconfigFailureSCG*; or

2> if the *failureType* is set to *randomAccessProblem* and the SCG failure was declared while T304 was running:

3> set *perRAInfoList* to indicate the performed random access procedure related information as specified in 5.7.10.5.

3> set the *failedPSCellId* to the physical cell identity and carrier frequency of the target PSCell of the failed PSCell change or failed PSCell addition;

3> set the *previousPSCellId* to the physical cell identity and carrier frequency of the source PSCell associated to the last received *RRCReconfiguration* message including *reconfigurationWithSync* for the SCG, if available;

3> set the *timeSCGFailure* to the elapsed time since the last execution of *RRCReconfiguration* message including the *reconfigurationWithSync* for the SCG until declaring the SCG failure;

2> else:

3> set the *failedPSCellId* to the physical cell identity and carrier frequency of the PSCell in which the SCG failure was declared;

3> if the last *RRCReconfiguration* message including the *reconfigurationWithSync* for the SCG was received to enter the PSCell in which the SCG failure was declared:

4> set the *timeSCGFailure* to the elapsed time since the last execution of *RRCReconfiguration* message including the *reconfigurationWithSync* for the SCG until declaring the SCG failure;

4> set the *previousPSCellId* to the physical cell identity and carrier frequency of the source PSCell associated to the last received *RRCReconfiguration* message including *reconfigurationWithSync* for the SCG;

1> release *successPSCell-Config* configured by the source PSCell, if available.

The UE shall submit the *SCGFailureInformation* message to lower layers for transmission.

NEXT CHANGE

#### 5.7.10.3 Reception of the *UEInformationRequest* message

Upon receiving the *UEInformationRequest* message, the UE shall, only after successful security activation:

1> if the *idleModeMeasurementReq* is included in the *UEInformationRequest* and the UE has stored *VarMeasIdleReport* that contains measurement information concerning cells other than the PCell:

2> if *validatedMeasurementsReq* is included in the *UEInformationRequest* and *measIdleValidityDuration* is included in *VarEnhMeasIdleConfig*;

3> set the *measResultIdleEUTRA* in the *UEInformationResponse* message to the value of *measReportIdleEUTRA* in the *VarMeasIdleReport* for any valid measurement results, if available, and set *validityStatus* to the value of *measIdleValidityDuration* in *VarEnhMeasIdleConfig* for each reported measurement;

3> set the *measResultIdleNR* in the UEInformationResponse message to the value of *measReportIdleNR* in the *VarMeasIdleReport* for any valid measurement results, if available, and set *validityStatus* to the value of *measIdleValidityDuration* in *VarEnhMeasIdleConfig* for each reported measurement;

3> discard the *VarMeasIdleReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

2> else:

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

3> set the *measResultIdleNR* in the *UEInformationResponse* message to the value of *measReportIdleNR* in the *VarMeasIdleReport*, if available;

3> discard the *VarMeasIdleReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if the *reselectionMeasurementReq* is included in the *UEInformationRequest*:

2> if *validatedMeasurementsReq* is included in the *UEInformationRequest* and *measReselectionValidityDuration* is included in *VarMeasReselectionConfig*;

3> if *measReselectionCarrierListNR* is present in *VarMeasReselectionConfig*:

4> set the *measResultReselectionNR* in the *UEInformationResponse* message the valid NR measurement results, if available for any frequency listed in *measReselectionCarrierListNR* in *VarMeasReselectionConfig* and set *validityStatus* to the value of *measIdleValidityDuration* in *VarMeasReselectionConfig* for each reported measurement;

3> else:

4> set the *measResultReselectionNR* in the *UEInformationResponse* message to any valid NR measurement results, if available, and set validityStatus to the value of *measIdleValidityDuration* in *VarMeasReselectionConfig*;

2> else:

3> if *measReselectionCarrierListNR* is present in *VarMeasReselectionConfig*:

4> set the *measResultReselectionNR* in the *UEInformationResponse* message the NR measurement results, if available for any frequency listed in *measReselectionCarrierListNR* in *VarMeasReselectionConfig*;

3> else:

4> set the *measResultReselectionNR* in the *UEInformationResponse* message to any NR measurement results, if available;

1> if the *logMeasReportReq* is present and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*, or if the current registered SNPN identity is included in *snpn-ConfigID-List* stored in *VarLogMeasReport*:

2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:

3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;

3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;

3> include the *traceRecordingSessionRef* and set it to the value of *traceRecordingSessionRef* in the *VarLogMeasReport;*

3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;

3> include the *logMeasInfoList* and set it to include one or more entries from the *VarLogMeasReport* starting from the entries logged first, and for each entry of the *logMeasInfoList* that is included, include all information stored in the corresponding *logMeasInfoList* entry in *VarLogMeasReport*;

3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

4> include the *logMeasAvailable*;

4> if *bt-LocationInfo* is included in *locationInfo* of one or more of the additional logged measurement entries in *VarLogMeasReport* that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

5> include the *logMeasAvailableBT*;

4> if *wlan-LocationInfo* is included in *locationInfo* of one or more of the additional logged measurement entries in *VarLogMeasReport* that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

5> include the *logMeasAvailableWLAN*;

1> if *ra-ReportReq* is set to *true* and the UE has random access related information available in *VarRA-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRA-Report*; or

1> if *ra-ReportReq* is set to *true* and the UE has random access related information available in *VarRA-Report* and if the registered SNPN identity is included in *snpn-IdentityList* stored in *VarRA-Report*:

2> for each *ra-ReportList* in *VarRA-Report* that consists of failed SDT information:

3> set *timeSinceSdtExecution* to the time that elapsed since SDT execution;

2> set the *ra-ReportList* in the *UEInformationResponse* message to the value of *ra-ReportList* in *VarRA-Report*;

2> discard the *ra-ReportList* from *VarRA-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if *rlf-ReportReq* is set to *true*:

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

2> if the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* stored in *VarRLF-Report*:

3> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link failure or handover failure in NR;

3> set the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report*;

3> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

2> else if the UE is capable of cross-RAT RLF reporting as defined in TS 38.306 [26] and has radio link failure information or handover failure information available in *VarRLF-Report* of TS 36.331 [10] and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report* of TS 36.331 [10]:

3> set *timeSinceFailure* in *VarRLF-Report* of TS 36.331 [10] to the time that elapsed since the last radio link failure or handover failure in EUTRA;

3> set failedPCellId-EUTRA in the *rlf-Report* in the *UEInformationResponse* message to indicate the PCell in which RLF was detected or the source PCell of the failed handover in the *VarRLF-Report* of TS 36.331 [10];

3> set the *measResult-RLF-Report-EUTRA* in the *rlf-Report* in the *UEInformationResponse* message to the value of *rlf-Report* in *VarRLF-Report* of TS 36.331 [10];

3> discard the *rlf-Report* from *VarRLF-Report* of TS 36.331 [10] upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure or connection resume failure information in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport* orin at least one of the entries of *VarConnEstFailReportList*:

1> if *connEstFailReportReq* is set to *true* and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* or *VarConnEstFailReportList* and if the registered SNPN identity is equal to *snpn-Identity* in *networkIdentity* stored in *VarConnEstFailReport* or any entry of *VarConnEstFailReportList*:

2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure or connection resume failure in NR;

2> set the *connEstFailReport* in the *UEInformationResponse* message to the value of *connEstFailReport* in *VarConnEstFailReport*;

2> if the UE supports multiple CEF report:

3> for each *connEstFailReport* in the *connEstFailReportList* in *VarConnEstFailReportList*:

4> set *timeSinceFailure* to the time that elapsed since the associated connection establishment failure or connection resume failure in NR;

2> for each *connEstFailReport* in the *connEstFailReportList* in the *UEInformationResponse* message, set the value to the value of *connEstFailReport* in *VarConnEstFailReport* in *VarConnEstFailReportList*;

2> discard the *connEstFailReport* from *VarConnEstFailReport* and *VarConnEstFailReportList* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if the *mobilityHistoryReportReq* is set to *true*:

2> include the *mobilityHistoryReport* and set it to include *visitedCellInfoList* from *VarMobilityHistoryReport*;

2> include in the *mobilityHistoryReport* an entry for the current PCell, possibly after removing the oldest entry if required, and set its fields as follows:

3> set *visitedCellId* to the global cell identity or the physical cell identity and carrier frequency of the current PCell:

3> set field *timeSpent* to the time spent in the current PCell;

3> if the UE supports PSCell mobility history information and if *visitedPSCellInfoList* is present in *VarMobilityHistoryReport*:

4> for the newest entry of the PCell in the *mobilityHistoryReport*, include *visitedPSCellInfoList* from *VarMobilityHistoryReport*;

4> if the UE is configured with a PSCell:

5> for the newest entry of the PCell in the *mobilityHistoryReport*, include the current PSCell information in the *visitedPSCellInfoListReport,* possibly after removing the oldest PSCell entry of a PCell in the *mobilityHistoryReport*, if required, and set its fields as follows:

6> set *visitedCellId* to the global cell identity or the physical cell identity and carrier frequency of the current PSCell:

6> set field *timeSpent* to the time spent in the current PSCell while being connected to the current PCell;

4> else:

5> for the newest entry of the PCell in the *mobilityHistoryReport*, include a new entry in the *visitedPSCellInfoListReport,* possibly after removing the oldest PSCell entry of a PCell in the *mobilityHistoryReport*, if required, and set its fields as follows:

6> set field *timeSpent* to the time spent without PSCell in the current PCell since last PSCell release since connected to the current PCell in RRC\_CONNECTED;

3> else if the UE supports PSCell mobility history information:

4> if the UE is configured with a PSCell:

5> for the newest entry of the PCell in the *mobilityHistoryReport*, include the current PSCell information in the *visitedPSCellInfoListReport,* possibly after removing the oldest PSCell entry of a PCell in the *mobilityHistoryReport*, if required, and set its fields as follows:

6> set *visitedCellId* to the global cell identity or the physical cell identity and carrier frequency of the current PSCell:

6> set field *timeSpent* to the time spent in the current PSCell while being connected to the current PCell;

4> else:

5> for the newest entry of the PCell in the *mobilityHistoryReport*, include a new entry in the *visitedPSCellInfoListReport,* possibly after removing the oldest PSCell entry of a PCell in the *mobilityHistoryReport*, if required, and set its fields as follows:

6> set field *timeSpent* to the time spent without PSCell in the current PCell since connected to the current PCell in RRC\_CONNECTED;

1> if the *successHO-ReportReq* is set to *true* and if the UE has successful handover related information available in *VarSuccessHO-Report* and if the RPLMN is included in the *plmn-IdentityList* stored in *VarSuccessHO-Report*; or

1> if the *successHO-ReportReq* is set to *true* and if the UE has successful handover related information available in *VarSuccessHO-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* if stored in the *VarSuccessHO-Report*:

2> if the *successHO-Report* in the *VarSuccessHO-Report* concerns a DAPS handover and if a PDCP PDU has been received from the source cell of the concerned HO and a non-duplicated PDCP PDU has been received from the target cell of the concerned HO:

3> set *upInterruptionTimeAtHO* in *VarSuccessHO-Report* to include the time elapsed between the time of arrival of the last PDCP PDU received from the source cell of the concerned handover and the time of arrival of the first non-duplicate PDCP PDU received from the target cell of the concerned handover, as measured at the time of arrival of the first non-duplicate PDCP PDU received from the target cell;

2> if the *successHO-Report* in the *VarSuccessHO-Report* concerns a *mobilityFromNRCommand*:

3> set *timeSinceSHR* in *VarSuccessHO-Report* to the time that elapsed since the successful handover report determination as specified in 5.7.10.6;

2> set the *successHO-Report* in the *UEInformationResponse* message to the value of *successHO-Report* in the *VarSuccessHO-Report*, if available;

2> discard the *VarSuccessHO-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if the *successPSCell-ReportReq* is set to *true* and if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarSuccessPSCell-Report*; or

1> if the *successPSCell-ReportReq* is set to *true* and if the UE has successful PSCell change or addition information available in *VarSuccessPSCell-Report* and if the current registered SNPN identity is included in *snpn-IdentityList* if stored in the *VarSuccessPSCell-Report*:

2> set the *successPSCell-Report* in the *UEInformationResponse* message to the value of *successPSCell-Report* in the *VarSuccessPSCell-Report*;

2> discard the *VarSuccessPSCell-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> if the *coarseLocationRequest* is set to *true*:

2> include *coarseLocationInfo,* if available;

1> if the *flightPathInfoReq* is included in the *UEInformationRequest* and the UE has (updated) flight path information available, set the *flightPathInfoReport* in the *UEInformationResponse* message as follows:

2> include the list of up to *maxWayPointNumber* waypoints, if any, along the flight path;

2> if the *includeTimeStamp* is set to *true*, for each included waypoint:

3> if available, set the field *timestamp* to the time when UE intends to arrive at the waypoint;

1> if the *logMeasReport* is included in the *UEInformationResponse*:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB2;

2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;

1> else:

2> submit the *UEInformationResponse* message to lower layers for transmission via SRB1.

#### 5.7.10.4 Actions for the Random Access report determination

Upon successfully performing random-access procedure initialized with 4-step or 2-step RA type, or upon failed or successfully completed on-demand system information acquisition procedure in RRC\_IDLE or RRC\_INACTIVE state, or upon failed or successfully completed RA-SDT operation as specified in clause 5.3.13.5, the UE shall:

1> if the RPLMN or the PLMN selected by upper layers (see TS24.501 [23]) from the PLMN(s) included in the *plmn-IdentityList* in *SIB1* is not included in *plmn-IdentityList* stored in a non-empty *VarRA-Report*; or

1> if the registered SNPN identity or the SNPN identity selected by upper layers (see TS24.501 [23]) from the list of SNPN(s) included in the *NPN-IdentityInfoList* in *SIB1*is not included in *snpn-IdentityList* stored in a non-empty *VarRA-Report*:

2> clear the information included in *VarRA-Report*;

1> if the UE is not in SNPN access mode and if the number of *RA-Report* entries stored in the *ra-ReportList* in *VarRA-Report* is less than *maxRAReport*:

2> if the number of PLMN entries in *plmn-IdentityList* in *identityList* stored in *VarRA-Report* is less than *maxPLMN*; or

2> if the number of PLMN entries in *plmn-IdentityList* in *identityList* stored in *VarRA-Report* is equal to *maxPLMN* and the list of EPLMNs is subset of or equal to the *plmn-IdentityList* stored in *VarRA-Report*:

3> append the following contents associated to the random-access procedure as a new entry in the *VarRA-Report*:

4> if the list of EPLMNs has been stored by the UE:

5> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN) without exceeding the limit of *maxPLMN*;

4> else:

5> set the *plmn-Identity*, in *plmn-IdentityList*, to the PLMN selected by upper layers (see TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityInfoList* in SIB1;

4> set the *cellId* to the global cell identity and the tracking area code, if available, otherwise to the physical cell identity and carrier frequency of the cell in which the corresponding random-access preamble was transmitted;

4> if the UE supports spCell ID indication:

5> if the corresponding random-access procedure was performed on an SCell of MCG:

6> set the *spCellId* to the global cell identity of the PCell;

5> if the corresponding random-access procedure was performed on an SCell of SCG:

6> set the *spCellId* to the global cell identity of the PSCell, if available, otherwise, set the *spCellId* to the global cell identity of the PCell;

5> if the corresponding random-access procedure was performed on PSCell:

6> if the *cellId* is not set to the global cell identity of the PSCell, set the *spCellId* to the global cell identity of the PCell;

4> if the random-access procedure is initiated for SDT and the SDT transmission was failed as defined in TS 38.300 [2]:

5> include the *sdt-Failed*;

5> set the *sdt-FailureCause* to the cause of SDT failure;

4> if SDT was evaluated and failed to initiate according to TS 38.321 [3]:

5> set the *sdt-DL-RsrpInfo* to the RSRP value measured at the time of SDT evaluation as specified in TS 38.321 [3];

5> set the *sdt-UL-DataVolume* to the UL data volume at the time of SDT evaluation as specified in TS 38.321 [3];

4> set the *raPurpose* to include the purpose of triggering the random-access procedure;

4> set the *ra-InformationCommon* as specified in clause 5.7.10.5.

1> if the UE is in SNPN access mode and if the number of *RA-Report* entries stored in the *ra-ReportList* in *VarRA-Report* is less than *maxRAReport*:

2> if the number of SNPN identity entries in *snpn-IdentityList* in *identityList* stored in *VarRA-Report* is less than *maxNPN*; or

2> if the number of SNPN identity entries in *snpn-IdentityList* in *identityList* stored in *VarRA-Report* is equal to *maxNPN* and the list of equivalent SNPN(s) is subset of or equal to the *snpn-IdentityList* stored in *VarRA-Report*:

3> append the following contents associated to the random-access procedure as a new entry in the *VarRA-Report*:

4> if the list of equivalent SNPN(s) has been stored by the UE:

5> set the *snpn-IdentityList* to include the list of equivalent SNPN(s) stored by the UE (i.e. includes the registered SNPN identity) without exceeding the limit of *maxNPN*;

4> else:

5> set the *snpn-Identity*, in *snpn-IdentityList*, to the SNPN identity selected by upper layers (see TS 24.501 [23]) from the SNPN identities included in the *NPN-IdentityInfoList* in SIB1;

4> set the *cellId* to the global cell identity and the tracking area code, if available, otherwise to the physical cell identity and carrier frequency of the cell in which the corresponding random-access preamble was transmitted;

4> if the UE supports spCell ID indication:

5> if the corresponding random-access procedure was performed on an SCell of MCG:

6> set the *spCellId* to the global cell identity of the PCell;

5> if the corresponding random-access procedure was performed on an SCell of SCG:

6> set the *spCellId* to the global cell identity of the PSCell, if available, otherwise, set the *spCellId* to the global cell identity of the PCell;

5> if the corresponding random-access procedure was performed on PSCell:

6> if the *cellId* is not set to the global cell identity of the PSCell, set the *spCellId* to the global cell identity of the PCell;

4> if the random-access procedure is initiated for SDT and the SDT transmission was failed as defined in TS 38.300 [2]:

5> include the *sdt-Failed*;

5> set the *sdt-FailureCause* to the cause of SDT failure;

4> if SDT was evaluated and failed to initiate according to TS 38.321 [3]:

5> set the *sdt-DL-RsrpInfo* to the RSRP value measured at the time of SDT evaluation as specified in TS 38.321 [3];

5> set the *sdt-UL-DataVolume* to the UL data volume at the time of SDT evaluation as specified in TS 38.321 [3];

4> set the *raPurpose* to include the purpose of triggering the random-access procedure;

4> set the *ra-InformationCommon* as specified in clause 5.7.10.5.

The UE may discard the random access report information, i.e. release the UE variable *VarRA-Report*, 48 hours after the last successful random access procedure or the failed or successfully completed on-demand system information acquisition procedure or the failed or successfully completed RA-SDT procedure related information is added to the *VarRA-Report*.

NOTE 1: Void.

#### 5.7.10.5 RA information determination

The UE shall, for the last successfully completed or last failed random-access procedure, set the content in *ra-InformationCommon* as follows:

1> set the *absoluteFrequencyPointA* to indicate the absolute frequency of the reference resource block associated to the random-access resources used in the random-access procedure;

1> set the *locationAndBandwidth* and *subcarrierSpacing* associated to the UL BWP of the random-access resources used in the random-access procedure;

1> if contention based random-access resources are used in the random-access procedure:

2> set the *msgA-RO-FrequencyStart* and *msgA-RO-FDM* and *msgA-SubcarrierSpacing* associated to the 2 step random- access resources if used in the random-access procedure;

2> if *msgA-SubcarrierSpacing* associated to the 2 step random-access resources used in the random-access procedure is available:

3> set the *msgA-SubcarrierSpacing* associated to the 2 step random-access resources used in the random-access procedure;

2> else if only 2 step random-access resources are available in the UL BWP used in the random-access procedure:

3> set the *msgA-SCS-From-prach-ConfigurationIndex* to the subcarrier spacing as derived from the *msgA-PRACH-ConfigurationIndex* used in the 2-step random-access procedure;

2> else:

3> set the *msg1-SubcarrierSpacing* associated to the 4 step random-access resources used in the random-access procedure;

2> set the *msg1-FrequencyStart* associated to the 4 step random-access resources if used in the random-access procedure, and if its value is different from the value of *msgA-RO-FrequencyStart* if it is included in the *ra-InformationCommon*;

2> set the *msg1-FDM* associated to the 4 step random-access resources if used in the random-access procedure, and if its value is different from the value of *msgA-RO-FDM* if it is included in the *ra-InformationCommon;*

2> if *msg1-SubcarrierSpacing* associated to the 4 step random-access resources used in the random-access procedure is available, and if its value is different from the value of *msgA-SubcarrierSpacing* if it is included in the *ra-InformationCommon*:

3> set the *msg1-SubcarrierSpacing* associated to the 4 step random-access resources used in the random-access procedure;

2> else:

3> set the *msg1-SCS-From-prach-ConfigurationIndex* to the subcarrier spacing as derived from the *prach-ConfigurationIndex* used in the 4-step random-access procedure, and if its value is different from the value of *msgA-SCS-From-prach-ConfigurationIndex* if it is included in the *ra-InformationCommon*;

1> if contention free random-access resources are used in the random-access procedure:

2> set the *msg1-FrequencyStartCFRA* and *msg1-FDMCFRA* associated to the 4 step random-access resources if used in the random-access procedure;

2> if *msg1-SubcarrierSpacing* associated to the 4 step random-access resources used in the random-access procedure is available:

3> set the *msg1-SubcarrierSpacingCFRA* associated to the 4 step random-access resources used in the random-access procedure;

2> else:

3> set the *msg1-SCS-From-prach-ConfigurationIndexCFRA* to the subcarrier spacing as derived from the *prach-ConfigurationIndex* used in the 4 step random-access procedure;

2> set the *msgA-RO-FrequencyStartCFRA* and *msgA-RO-FDMCFRA* associated to the 2 step contention free random access resources if used in the random-access procedure;

2> set the *msgA-MCS*, the *nrofPRBs-PerMsgA-PO*, the *msgA-PUSCH-TimeDomainAllocation*, the *frequencyStartMsgA-PUSCH*, the *nrofMsgA-PO-FDM* associated to the 2 step random-access resources if used in the random-access procedure;

2> if *msgA-SubcarrierSpacing* associated to the 2 step random-access resources used in the random-access procedure is available:

3> set the *msgA-SubcarrierSpacing* associated to the 2 step random-access resources used in the random-access procedure;

2> else if only 2 step random-access resources are available in the UL BWP used in the random-access procedure:

3> set the *msgA-SCS-From-prach-ConfigurationIndex* to the subcarrier spacing as derived from the *msgA-PRACH-ConfigurationIndex* used in the 2-step random-access procedure;

2> else:

3> set the *msg1-SubcarrierSpacing* associated to the 4 step random-access resources used in the random-access procedure;

1> if the random access procedure is initialized with *RA\_TYPE* set to *2-stepRA* as described in TS 38.321 [3]:

2> set the *dlPathlossRSRP* to the measeured RSRP of the DL pathloss reference obtained at the time of *RA\_Type* selection stage of the initialization of the RA procedure as captured in TS 38.321 [3];

2> if the configuration for the random access *msgA-TransMax* was configured in *RACH-ConfigDedicated* for this random access procedure, and *raPurpose* is set to *reconfigurationWithSync*:

3> set *msgA-TransMax* to the value of *msgA-TransMax* in *RACH-ConfigDedicated*;

2> else if *msgA-TransMax* was configured in *RACH-ConfigCommonTwoStepRA*:

3> set *msgA-TransMax* to the value of *msgA-TransMax* in *RACH-ConfigCommonTwoStepRA*;

2> set the *msgA-PUSCH-PayloadSize* to the size of the overall payload available in the UE buffer at the time of initiating the 2 step RA procedure;

1> if the purpose of the random access procedure is to request on-demand system information (i.e., if the *raPurpose* is set to *requestForOtherSI* or *msg3RequestForOtherSI*):

2> set the *intendedSIBs* to indicate the SIB(s) the UE wanted to receive as a result of the SI request;

2> set the *ssbsForSI-Acquisition* to indicate the SSB(s) used to receive the SI message;

2> if the on-demand system information acquisition was successful:

3> set the *onDemandSISuccess* to *true*;

1> if one or more of the features including RedCap and/or Slicing and/or SDT and/or MSG3 repetitions and/or MSG1 repetitions and/or eRedCap are applicable for this random-access procedure as specified in clause 5.1.1b of TS 38.321[3]:

2> set the *triggeredFeatureCombination* to indicate all the features triggering this random-access procedure as below:

3> if this random-access procedure is triggered by RedCap, include *redCap*;

3> if this random-access procedure is triggered by SDT, include *smallData*;

3> if this random-access procedure is triggered by Msg3 repetitions, include *msg3-Repetitions*;

3> if this random-access procedure is triggered by Msg1 repetitions, include *msg1-Repetitions*;

3> if this random-access procedure is triggered by eRedCap, include *eRedCap*;

3> if this random-access procedure is triggered by slicing, set *nsag* to the NSAG-ID(s) applied in the random-access procedure and set the *triggered-S-NSSAI-List* to include all the *S-NSSAI(s)* associated to the slices triggering the access attempt in the random-access procedure;

2> if the value of used feature or combination of features is different from the *triggeredFeatureCombination*:

3> set the *usedFeatureCombination* to indicate one or more features of *FeatureCombination* associated to the random-access resource used in the random-access procedure as below:

4> if RedCap is part of the used *FeatureCombination*, include *redCap*;

4> if SDT is part of the used *FeatureCombination*, include *smallData*;

4> if Msg3 repetitions is part of the used *FeatureCombination*, include *msg3-Repetitions*;

4> if Msg1 repetitions is part of the used *FeatureCombination*, include *msg1-Repetitions*;

4> if *eRedCap* is part of the used *FeatureCombination*, include *eRedCap*;

4> if NSAG(s) is part of the used *FeatureCombination*, set *nsag* to include the *NSAG-ID(s)* configured for the used *FeatureCombination*;

2> set the *startPreambleForThisPartition* to the value of *startPreambleForThisPartition* in *FeatureCombinationPreambles* associated to the used *FeatureCombination*;

2> set the *numberOfPreamblesPerSSB-ForThisPartition* to the value of *numberOfPreamblesPerSSB-ForThisPartition* in *FeatureCombinationPreambles* associated to the used *FeatureCombination*;

1> set the parameters associated to the successive random-access attempts associated to the selected beam in the *perRAInfoList* as follows:

2> if the random-access resource used is associated to a SS/PBCH block, set the associated random-access parameters for the successive random-access attempts associated to the same SS/PBCH block for one or more random-access attempts as follows:

3> set the *ssb-Index* to include the SS/PBCH block index associated to the used random-access resource;

3> set the *numberOfPreamblesSentOnSSB* to indicate the number of successive random-access attempts associated to the SS/PBCH block;

3> if all preamble transmissions for the successive random-access attempts associated to this SS/PBCH block were blocked by LBT:

4> include *allPreamblesBlocked*;

3> else:

4> if LBT failure indication was received from lower layers for the last random-access preamble transmission attempt in the SS/PBCH block associated to the *ssb-Index*, before changing the SS/PBCH block for random access preamble transmission:

5> include *lbt-Detected*;

3> for each random-access attempt performed on the random-access resource, except the random-access attempts for which LBT failure indication was received from lower layers, include the following parameters in the chronological order of the random-access attempt:

4> if the random-access attempt is performed on the contention based random-access resource and if *raPurpose* is not equal to '*requestForOtherSI*', include *contentionDetected* as follows:

5> if contention resolution was not successful as specified in TS 38.321 [6] for the transmitted preamble:

6> set the *contentionDetected* to *true*;

5> else:

6> set the *contentionDetected* to *false*;

4> if the random access attempt is a 2-step random access attempt:

5> if fallback from 2-step random access to 4-step random access occurred during the random access attempt:

6> set *fallbackToFourStepRA* to *true*;

4> if the random-access attempt is performed on the contention based random-access resource; or

4> if the random-access attempt is performed on the contention free random-access resource and if the random-access procedure was initiated due to the PDCCH ordering:

5> if the random access attempt is a 4-step random access attempt and the SS/PBCH block RSRP of the SS/PBCH block corresponding to the random-access resource used in the random-access attempt is above *rsrp-ThresholdSSB*; or

5> if the random access attempt is a 2-step random access attempt and the SS/PBCH block RSRP of the SS/PBCH block corresponding to the random-access resource used in the random-access attempt is above *msgA-RSRP-ThresholdSSB*:

6> set the *dlRSRPAboveThreshold* to *true*;

5> else:

6> set the *dlRSRPAboveThreshold* to *false*;

2> else if the random-access resource used is associated to a CSI-RS, set the associated random-access parameters for the successive random-access attempts associated to the same CSI-RS for one or more random-access attempts as follows:

3> set the *csi-RS-Index* to include the CSI-RS index associated to the used random-access resource;

3> set the *numberOfPreamblesSentOnCSI-RS* to indicate the number of successive random-access attempts associated to the CSI-RS;

3> if all preamble transmissions for the successive random-access attempts associated to this CSI-RS were blocked by LBT:

4> include *allPreamblesBlocked*;

3> else:

4> if LBT failure indication was received from lower layers for the last random-access preamble transmission attempt in the CSI-RS associated to the *csi-RS-Index*, before changing the CSI-RS for random access preamble transmission:

5> include *lbt-Detected;*

1> if at least one LBT failure indication has been received from lower layers during the random-access procedure:

2> set the *numberOfLBT-Failures* to indicate the total number of random-access attempts for which LBT failure indications have been received from lower layers in the random-access procedure.

The UE shall, for all the BWPs in which consistent LBT failures are triggered and not cancelled (according to TS 38.321 [3]) prior to successful RA completion or prior to RLF/HOF, set the below parameters in *attemptedBWP-InfoList* in the chronological order of BWP selection:

1> set the *locationAndBandwidth* and *subcarrierSpacing* associated to the UL BWP.

NOTE 1: Void.

NOTE 2: If *allPreamblesBlocked* is included, it is left to UE implementation how to set the *numberOfPreamblesSentOnSSB-r16*, *numberOfPreamblesSentOnCSI-RS-r16* and the *perRAAttemptInfoList-r16*.

#### 5.7.10.6 Actions for the successful handover report determination

The UE shall for the PCell:

1> if the procedure is triggered due to successful completion of reconfiguration with sync, and if the ratio between the value of the elapsed time of the timer T304 and the configured value of the timer T304, included in the last applied *RRCReconfiguration* message including the *reconfigurationWithSync*, is greater than *thresholdPercentageT304* if included in the *successHO-Config* received before executing the last reconfiguration with sync; or

1> if the procedure is triggered due to successful completion of reconfiguration with sync, and if the ratio between the value of the elapsed time of the timer T310 and the configured value of the timer T310, configured while the UE was connected to the source PCell before executing the last reconfiguration with sync, is greater than *thresholdPercentageT310* included in the *successHO-Config* if configured by the source PCell before executing the last reconfiguration with sync; or

1> if the procedure is triggered due to successful completion of reconfiguration with sync, and if the T312 associated to the measurement identity of the target cell was running at the time of initiating the execution of the reconfiguration with sync procedure and if the ratio between the value of the elapsed time of the timer T312 and the configured value of the timer T312, configured while the UE was connected to the source PCell before executing the last reconfiguration with sync, is greater than *thresholdPercentageT312* included in the s*uccessHO-Config* if configured by the source PCell before executing the last reconfiguration with sync; or

1> if the procedure is triggered due to successful completion of reconfiguration with sync, and if *sourceDAPS-FailureReporting* is included in the *successHO-Config* before executing the last reconfiguration with sync and is set to *true* and if the last executed handover was a DAPS handover and if an RLF occurred at the source PCell during the DAPS handover while T304 was running; or:

1> if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA*,* and if the ratio between the value of the elapsed time of the timer T310 and the configured value of the timer T310, configured while the UE was connected to the source PCell before executing the last Mobility from NR to E-UTRA, is greater than *thresholdPercentageT310* included in the *successHO-Config* if configured by the source PCell before executing the last Mobility from NR to E-UTRA; or

1> if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA, and if the T312 associated to the measurement identity of the target cell was running at the time of initiating the execution of the Mobility from NR to E-UTRA and if the ratio between the value of the elapsed time of the timer T312 and the configured value of the timer T312, configured while the UE was connected to the source PCell before executing the last Mobility from NR to E-UTRA, is greater than *thresholdPercentageT312* included in the s*uccessHO-Config* if configured by the source PCell before executing the last Mobility from NR to E-UTRA:

2> store the successful handover information in *VarSuccessHO-Report* and determine the content in *VarSuccessHO-Report* as follows:

3> clear the information included in *VarSuccessHO-Report*, if any;

3> if the UE is not in SNPN access mode, set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e., includes the RPLMN);

3> else if the UE is in SNPN access mode, set the *snpn-IdentityList* to include the list of equivalent SNPNs stored by the UE (i.e., including the registered SNPN identity), if available;

3> for intra-NR handover, set the *c-RNTI* to the C-RNTI assigned by the target PCell of the handover;

3> if the procedure is triggered due to successful completion of reconfiguration with sync, for the source PCell in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied; or

3> if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA, for the source PCell in which the last *MobilityFromNRCommand* concerning an inter-RAT handover from NR to E-UTRA was applied:

4> set the *sourcePCellID* in *sourceCellInfo* to the global cell identity and tracking area code, if available, of the source PCell;

4> set the *sourceCellMeas* in *sourceCellInfo* to include the cell level RSRP, RSRQ and the available SINR, of the source PCell based on the available SSB and CSI-RS measurements collected up to the moment the UE sends *RRCReconfigurationComplete* message if the procedure is triggered due to successful completion of reconfiguration with sync, or up to the moment the UE sends the EUTRA *RRCConnectionReconfigurationComplete* message if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA;

4> set the *rsIndexResults* in *sourceCellMeas* to include all the available SSB and CSI-RS measurement quantities of the source PCell collected up to the moment the UE sends *RRCReconfigurationComplete* message if the procedure is triggered due to successful completion of reconfiguration with sync, or up to the moment the UE sends the EUTRA *RRCConnectionReconfigurationComplete* message if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA;

4> if the UE supports successful handover report for LTM and the procedure is triggered due to successful completion of reconfiguration with sync concerning an LTM cell switch:

5> set the *resultsSSB-Indexes* in *sourceCellMeasL1* to include all the available SS/PBCH block L1-RSRP measurement quantities of the source PCell collected up to the moment the UE sends *RRCReconfigurationComplete* message;

4> if the last executed handover was a DAPS handover and if an RLF occurred at the source PCell during the DAPS handover while T304 was running:

5> set the *rlf-InSourceDAPS* in *sourceCellInfo* to *true*;

3> if the procedure is triggered due to successful completion of reconfiguration with sync and if the UE was configured with *condExecutionCond* and *condExecutionCondPScell*, for the source PSCell in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied;

4> set the *sourcePSCellId* in *sourcePSCellInfo* to the global cell identity and tracking area code, if available, of the source PSCell;

4> set the *sourcePSCellMeas* in *sourcePSCellInfo* to include the cell level RSRP, RSRQ and the available SINR, of the source PSCell based on the available SSB and CSI-RS measurements collected up to the moment the UE sends *RRCReconfigurationComplete* message if the procedure is triggered due to successful completion of reconfiguration with sync;

4> set the *rsIndexResults* in *sourcePSCellMeas* to include all the available SSB and CSI-RS measurement quantities of the source PSCell collected up to the moment the UE sends *RRCReconfigurationComplete* message if the procedure is triggered due to successful completion of reconfiguration with sync;

3> if the procedure is triggered due to successful completion of reconfiguration with sync, for the target PCell indicated in the last applied *RRCReconfiguration* message including *reconfigurationWithSync*:

4> set the *targetPCellID* in *targetCellInfo* to the global cell identity and tracking area code, if available, of the target PCell; otherwise, set the *targetCell-PCI-ARFCN* to the physical cell identity and carrier frequency of the target PCell;

NOTE 00: If *targetCell-PCI-ARFCN* is included, it is left to UE implementation how to set the *targetPCellID*.

4> set the *targetCellMeas* in *targetCellInfo* to include the cell level RSRP, RSRQ and the available SINR, of the target PCell based on the available SSB and CSI-RS measurements collected up to the moment the UE sends *RRCReconfigurationComplete* message;

4> set the *rsIndexResults* in *targetCellMeas* to include all the available SSB and CSI-RS measurement quantities of the target PCell collected up to the moment the UE sends *RRCReconfigurationComplete* message;

4> if the UE supports successful handover report for LTM and the procedure is triggered due to successful completion of reconfiguration with sync concerning an LTM cell switch:

5> set the *resultsSSB-Indexes* in *targetCellMeasL1* to include all the available SS/PBCH block L1-RSRP measurement quantities of the target PCell collected up to the moment the UE sends *RRCReconfigurationComplete* message;

4> if the last applied *RRCReconfiguration* message including *reconfigurationWithSync* was included in the stored *condRRCReconfig*:

5> set the *timeSinceCHO-Reconfig* to the time elapsed between the initiation of the execution of conditional reconfiguration for the target PCell and the reception of the last *conditionalReconfiguration* including the *condRRCReconfig* of the target PCell in the source PCell;

3> if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA, for the target PCell indicated in the last applied *MobilityFromNRCommand* concerning an inter-RAT handover from NR to E-UTRA:

4> set the *targetPCellId* in *eutra-TargetCellInfo* to the global cell identity and tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell;

4> set the *targetCellMeas* in *eutra-TargetCellInfo* to include the cell level RSRP, RSRQ and the available SINR, of the target PCell based on the available measurements collected up to the moment the UE sends *RRCConnectionReconfigurationComplete* message;

NOTE 0: If *eutra-TargetCellInfo* is included, it is left to UE implementation how to set the *targetCellInfo*.

3> if the procedure is triggered due to successful completion of reconfiguration with sync and if the ratio between the value of the elapsed time of the timer T304 and the configured value of the T304 timer, included in the last applied *RRCReconfiguration* message including the *reconfigurationWithSync*, is greater than *thresholdPercentageT304* if included in the *successHO-Config* received before executing the last reconfiguration with sync:

4> set *t304-cause* in *shr-Cause* to *true*;

4> set the *ra-InformationCommon* to include the random-access related information associated to the random access procedure in the target PCell, as specified in clause 5.7.10.5;

3> if the ratio between the value of the elapsed time of the timer T310 and the configured value of the T310 timer, configured while the UE was connected to the source PCell before executing the last reconfiguration with sync or the last Mobility from NR to E-UTRA, is greater than *thresholdPercentageT310* included in the *successHO-Config* if configured by the source PCell before executing the last reconfiguration with sync or Mobility from NR to E-UTRA:

4> set *t310-cause* in *shr-Cause* to *true*;

3> if the T312 associated to the measurement identity of the target cell was running at the time of initiating the execution of the reconfiguration with sync procedure or Mobility from NR to E-UTRA, and if the ratio between the value of the elapsed time of the timer T312 and the configured value of the T312 timer, configured while the UE was connected to the source PCell before executing the last reconfiguration with sync or Mobility from NR to E-UTRA, is greater than *thresholdPercentageT312* included in the s*uccessHO-Config* if configured by the source PCell before executing the last reconfiguration with sync, or Mobility from NR to E-UTRA:

4> set *t312-cause* in *shr-Cause* to *true*;

3> if the procedure is triggered due to successful completion of reconfiguration with sync and if *sourceDAPS-FailureReporting* included in the *successHO-Config* if configured by the source PCell before executing the last reconfiguration with sync is set to *true*, and if the last executed handover was a DAPS handover and if an RLF occurred at the source PCell during the DAPS handover while T304 was running:

4> set *sourceDAPS-Failure* in *shr-Cause* to *true*;

3> if the procedure is triggered due to successful completion of reconfiguration with sync, for each of the *measObjectNR*, configured by the source PCell, in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied;or:

3> if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA, for each of the *measObjectNR*, configured by the source PCell, in which the last *MobilityFromNRCommand* concerning an inter-RAT handover from NR to E-UTRA was applied:

4> if *measRSSI-ReportConfig* is configured for the frequency of the source PCell:

5> if the procedure is triggered due to successful completion of reconfiguration with sync:

6> set the *measResultServCellRSSI* to the linear average of the available RSSI sample value(s) provided by lower layers for the frequency of the source PCell up to the moment the UE sends the *RRCReconfigurationComplete* message;

5> else if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA:

6> set the *measResultServCellRSSI* to the linear average of the available RSSI sample value(s) provided by lower layers for the frequency of the source PCell up to the moment the UE sends the EUTRA *RRCConnectionReconfigurationComplete* message;

4> for each of the configured *measObjectNR* if *measRSSI-ReportConfig* is configured for the configured frequency:

5> if the procedure is triggered due to successful completion of reconfiguration with sync:

6> set the *measResultNeighFreqRSSI* in the *measResultNeighFreqListRSSI* to the linear average of the available RSSI sample value(s) provided by lower layers for the associated neighbouring frequency up to the moment the UE sends the *RRCReconfigurationComplete* message:

7> for each neighbour frequency included, include the optional fields that are available;

5> else if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA:

6> set the *measResultNeighFreqRSSI* in the *measResultNeighFreqListRSSI* to the linear average of the available RSSI sample value(s) provided by lower layers for the associated neighbouring frequency up to the moment the UE sends the EUTRA *RRCConnectionReconfigurationComplete* message:

7> for each neighbour frequency included, include the optional fields that are available;

4> if measurements are available for the *measObjectNR*:

5> if the SS/PBCH block-based measurement quantities are available:

6> set the *measResultListNR* in *measResultNeighCells* to include all the available measurement quantities of the best measured cells, other than the source PCell or target PCell, ordered such that the cell with highest SS/PBCH block RSRP is listed first if SS/PBCH block RSRP measurement results are available, otherwise the cell with highest SS/PBCH block RSRQ is listed first if SS/PBCH block RSRQ measurement results are available, otherwise the cell with highest SS/PBCH block SINR is listed first, based on the available SS/PBCH block based measurements collected up to the moment the UE sends the *RRCReconfigurationComplete* message if the procedure is triggered due to successful completion of reconfiguration with sync, or up to the moment the UE sends the EUTRA *RRCConnectionReconfigurationComplete* message if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA;

6> for each neighbour cell included, include the optional fields that are available;

NOTE 1: For the neighboring cells set included in *measResultListNR* in *measResultNeighCells* ordered based on the SS/PBCH block measurement quantities, the UE includes also the CSI-RS based measurement quantities, if available.

5> if the CSI-RS measurement quantities are available:

6> set the *measResultListNR* in *measResultNeighCells* to include all the available measurement quantities of the best measured cells, other than the source PCell and target PCell, ordered such that the cell with highest CSI-RS RSRP is listed first if CSI-RS RSRP measurement results are available, otherwise the cell with highest CSI-RS RSRQ is listed first if CSI-RS RSRQ measurement results are available, otherwise the cell with highest CSI-RS SINR is listed first, based on the available CSI-RS based measurements collected up to the moment the UE sends the *RRCReconfigurationComplete* message if the procedure is triggered due to successful completion of reconfiguration with sync, or up to the moment the UE sends the EUTRA *RRCConnectionReconfigurationComplete* message if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA;

6> for each neighbour cell included, include the optional fields that are available;

NOTE 2: For the neighboring cells set ordered based on the CSI-RS measurement quantities, the UE includes measurements only for the cells not yet included in *measResultListNR* in *measResultNeighCells* to avoid overriding SS/PBCH block-based ordered measurements.

3> if the UE supports successful handover report for LTM and the procedure is triggered due to successful completion of reconfiguration with sync concerning an LTM cell switch:

4> for each neighbour MCG LTM candidate cell contained in the current UE configuration:

5> if SS/PBCH block-based L1-RSRP measurement quantities are available:

6> set the *neighCellsMeasL1ListNR* to include all the available SS/PBCH block-based L1-RSRP measurement results of the best measured cells, other than the source PCell or target PCell, ordered such that the cell with highest SS/PBCH block-based L1-RSRP (of all SS/PBCH block-based L1-RSRP measurement results for the cell) is listed first, based on the available SS/PBCH block-based L1-RSRP measurements collected up to the moment the UE sends the *RRCReconfigurationComplete* message;

3> if the procedure is triggered due to successful completion of reconfiguration with sync, for each of the *measObjectEUTRA*, configured by the source PCell in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied; or:

3> if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA, for each of the *measObjectEUTRA*, configured by the source PCell in which the last *MobilityFromNRCommand* concerning an inter-RAT handover from NR to E-UTRA was applied:

4> if measurements are available for the *measObjectEUTRA*:

5> set the *measResultListEUTRA* in *measResultNeighCells* to include the best measured cells ordered such that the cell with highest RSRP is listed first if RSRP measurement results are available, otherwise the cell with highest RSRQ is listed first, based on measurements collected up to the moment the UE sends the *RRCReconfigurationComplete* message if the procedure is triggered due to successful completion of reconfiguration with sync, or up to the moment the UE sends the EUTRA *RRCConnectionReconfigurationComplete* message if the procedure is triggered due to successful completion of Mobility from NR to E-UTRA;

5> for each neighbour cell included, include the optional fields that are available;

3> for each of the neighbour cells included in *measResultNeighCells*:

4> if the cell was a candidate target cell included in the *condRRCReconfig* within the *conditionalReconfiguration* configured by the source PCell, in which the last *RRCReconfiguration* message including *reconfigurationWithSync* was applied:

5> set the *choCandidate* to *true* in *measResultNR*;

4> if the UE supports successful handover report for LTM and the cell was an MCG LTM candidate target cell contained in the current UE configuration:

 5> set the *ltm-Candidate* to *true* in *measResultNR*;

3> if the UE supports successful handover report for LTM and the procedure is triggered due to successful completion of reconfiguration with sync concerning an LTM cell switch:

4> if the last executed LTM cell switch is a RACH-less LTM cell switch:

5> include the *rachLess*;

3> if the procedure is triggered due to successful completion of reconfiguration with sync and if the UE was configured with *condExecutionCond* and *condExecutionCondPScell*, for each *ChoWithCandidateSCGInfo* in *choWithCandidateSCGInfoList*:

4> set *firstFulfilledConfig* to *cho* or *cpc*, whichever was fulfilled first in time;

4> if all triggering conditionsof both *condExecutionCond* and *condExecutionCondPSCell* are fulfilled:

5> set timeBetweenFulfillment to the elapsed time between the fulfillments of the last triggering events of the two execution conditions;

4> else if all triggering conditionsof one of the *condExecutionCond* or *condExecutionCondPSCell* are fulfilled:

5> set *timeBetweenLastFulfillmentAndEvent* to the elapsed time between the point in time of fulfilling the last triggering event of the fulfilled execution condition and handover execution;

4> include the global cell identity and tracking area code, if available, and otherwise the physical cell identity and carrier frequency of the candidate PCell and candidate PSCell;

4> include the available measurement quantities (SS/PBCH block or CSI-RS) in the *MeasResults*;

3> if available, set the *locationInfo* as in 5.3.3.7;

1> release *successHO-Config* configured by the source PCell and *thresholdPercentageT304* if configured by the target PCell.

The UE may discard the successful handover information, i.e., release the UE variable *VarSuccessHO-Report*, 48 hours after the last successful handover information is added to the *VarSuccessHO-Report*.

Editor’s Note: FFS of the UE capability of supporting successful handover report for LTM cell switch.

#### 5.7.10.7 Actions for the successful PSCell change or addition report determination

The UE shall for the PSCell:

1> if the ratio between the value of the elapsed time of the timer T304 and the configured value of the timer T304, included in the last applied *RRCReconfiguration* message for the SCG including the *reconfigurationWithSync*, is greater than *thresholdPercentageT304-SCG* if included in the *successPSCell-Config* received before executing the last reconfiguration with sync for the SCG; or

1> if *sn-InitiatedPSCellChange* associated to the last applied *RRCReconfiguration* with *reconfigurationWithSync* for the SCG is configured and if the ratio between the value of the elapsed time of the timer T310 and the configured value of the timer T310, configured while the UE was connected to the source PSCell before executing the last reconfiguration with sync for the SCG, is greater than *thresholdPercentageT310-SCG* included in the *successPSCell-Config* if configured by the source PSCell before executing the last reconfiguration with sync for the SCG; or

1> if *sn-InitiatedPSCellChange* associated to the last applied *RRCReconfiguration* with *reconfigurationWithSync* for the SCG is configured and if the T312 associated to the measurement identity of the target PSCell was running at the time of initiating the execution of the reconfiguration with sync procedure for the SCG and if the ratio between the value of the elapsed time of the timer T312 and the configured value of the timer T312, configured while the UE was connected to the source PSCell before executing the last reconfiguration with sync, is greater than *thresholdPercentageT312-SCG* included in the s*uccessPSCell-Config* if configured by the source PSCell before executing the last reconfiguration with sync for the SCG:

1> if *sn-InitiatedPSCellChange* associated to the last applied *RRCReconfiguration* with *reconfigurationWithSync* for the SCG is not configured and if the ratio between the value of the elapsed time of the timer T310 and the configured value of the timer T310, configured while the UE was connected to the source PSCell before executing the last reconfiguration with sync for the SCG, is greater than *thresholdPercentageT310-SCG* included in the *successPSCell-Config* if configured by the PCell before executing the last reconfiguration with sync for the SCG; or

1> if *sn-InitiatedPSCellChange* associated to the last applied *RRCReconfiguration* with *reconfigurationWithSync* for the SCG is not configured and if the T312 associated to the measurement identity of the target PSCell was running at the time of initiating the execution of the reconfiguration with sync procedure for the SCG and if the ratio between the value of the elapsed time of the timer T312 and the configured value of the timer T312, configured while the UE was connected to the source PSCell before executing the last reconfiguration with sync, is greater than *thresholdPercentageT312-SCG* included in the s*uccessPSCell-Config* if configured by the PCell before executing the last reconfiguration with sync for the SCG:

2> clear the information included in *VarSuccessPSCell-Report*, if any;

2> store the successful PSCell change or addition information in *VarSuccessPSCell-Report* and determine the content in *VarSuccessPSCell-Report* as follows:

3> if the UE is not in SNPN access mode, set the *plmn-IdentityList* to include the list of EPLMNs (including the RPLMN) stored by the UE;

3> else if the UE is in SNPN access mode, set the *snpn-IdentityList* to include the list of equivalent SNPN identities (including the registered SNPN identity) stored by the UE, if available;

3> set the *pCellId* to the global cell identity and tracking area code, if available, of the PCell;

3> for the source PSCell (in case of PSCell change procedure) in which the last *RRCReconfiguration* message for the SCG including *reconfigurationWithSync* was applied:

4> set the *sourcePSCellId* in *sourcePSCellInfo* to the global cell identity and tracking area code, and otherwise to the physical cell identity and carrier frequency of the source PSCell;

4> set the *sourcePSCellMeas* in *sourcePSCellInfo* to include the cell level RSRP, RSRQ and the available SINR, of the source PSCell based on the available SSB and CSI-RS measurements collected up to the moment the UE successfully completed the random access procedure for the SCG;

4> set the *rsIndexResults* in *sourcePSCellMeas* to include all the available SSB and CSI-RS measurement quantities of the source PSCell collected up to the moment the UE successfully completed the random access procedure for the SCG;

3> for the target PSCell indicated in the last applied *RRCReconfiguration* message for the SCG including *reconfigurationWithSync*:

4> set the *targetPSCellID* in *targetPSCellInfo* to the global cell identity and tracking area code, if available, and otherwise to the physical cell identity and carrier frequency of the target PSCell;

4> set the *targetPSCellMeas* in *targetPSCellInfo* to include the cell level RSRP, RSRQ and the available SINR, of the target PSCell based on the available SSB and CSI-RS measurements collected up to the moment the UE successfully completed the random access procedure for the SCG;

4> set the *rsIndexResults* in *targetPSCellMeas* to include all the available SSB and CSI-RS measurement quantities of the target PSCell collected up to the moment the UE successfully completed the random access procedure for the SCG;

4> if the last applied *RRCReconfiguration* message for the SCG including *reconfigurationWithSync* was included in the stored *condRRCReconfig*:

5> set the *timeSinceCPAC-Reconfig* to the time elapsed between the initiation of the execution of conditional reconfiguration for the target PSCell and the reception of the last *conditionalReconfiguration* for the SCG including the *condRRCReconfig* of the target PSCell;

3> if triggering threshold for storing the successful PSCell change or addition information in *VarSuccessPSCell-Report* based on the *thresholdPercentageT304-SCG* is met:

4> set *t304-cause* in *spr-Cause* to *true*;

4> set the *ra-InformationCommon* to include the random-access related information associated to the random access procedure in the target PSCell, as specified in clause 5.7.10.5;

3> if triggering threshold for storing the successful PSCell change or addition information in *VarSuccessPSCell-Report* based on the *thresholdPercentageT310-SCG* is met:

4> set *t310-cause* in *spr-Cause* to *true*;

3> if triggering threshold for storing the successful PSCell change or addition information in *VarSuccessPSCell-Report* based on the *thresholdPercentageT312-SCG* is met:

4> set *t312-cause* in *spr-Cause* to *true*;

3> if *sn-InitiatedPSCellChange* associated to the last applied *RRCReconfiguration* with *reconfigurationWithSync* for the SCG is configured:

4> consider all *measObjectNR* configured by the source PSCell;

3> else:

4> consider all *measObjectNR* configured by the PCell;

3> for each of the considered *measObjectNR*:

4> if measurements are available for the *measObjectNR*:

5> if the SS/PBCH block-based measurement quantities are available:

6> include in the *measResultListNR* in *measResultNeighCells* all the available measurement quantities of the best measured cells, other than the source PSCell (in case of PSCell change procedure) or target PSCell, ordered such that the cell with highest SS/PBCH block RSRP is listed first if SS/PBCH block RSRP measurement results are available, otherwise the cell with highest SS/PBCH block RSRQ is listed first if SS/PBCH block RSRQ measurement results are available, otherwise the cell with highest SS/PBCH block SINR is listed first, based on the available SS/PBCH block based measurements collected up to the moment the UE successfully completed the random access procedure;

6> for each neighbour cell included, include the optional fields that are available (including the CSI-RS based measurement quantities, if available);

5> if the CSI-RS measurement quantities are available for the cells not yet included in *measResultListNR* in *measResultNeighCells*:

6> include in the *measResultListNR* in *measResultNeighCells* all the available measurement quantities of the best measured cells, other than the source PSCell (in case of PSCell change procedure) and target PSCell, ordered such that the cell with highest CSI-RS RSRP is listed first if CSI-RS RSRP measurement results are available, otherwise the cell with highest CSI-RS RSRQ is listed first if CSI-RS RSRQ measurement results are available, otherwise the cell with highest CSI-RS SINR is listed first, based on the available CSI-RS based measurements collected up to the moment the UE successfully completed the random access procedure;

6> for each neighbour cell included, include the optional fields that are available;

3> for each of the neighbour cells included in *measResultNeighCells*:

4> if the cell was a candidate target cell included in the *condRRCReconfig* within the *conditionalReconfiguration*, configured by the source PCell including the *condExecutionCond* within the *conditionalReconfiguration* associated to *condEventA4* or by the source PSCell (in case of PSCell change) when the last *RRCReconfiguration* message for the SCG including *reconfigurationWithSync* was applied:

5> set the *choCandidate* to *true* in *measResultNR*;

3> if *sn-InitiatedPSCellChange* associated to the last applied *RRCReconfiguration* with *reconfigurationWithSync* for the SCG is configured:

4> if available, set the *locationInfo* as in 5.3.3.7 according to the *otherConfig* associated with the source PSCell;

4> include *sn-InitiatedPSCellChange*;

3> else:

4> if available, set the *locationInfo* as in 5.3.3.7 according to the *otherConfig* associated with the PCell;

1> release *successPSCell-Config* configured by the source PSCell if available and *thresholdPercentageT304* if configured by the target PSCell.

The UE may discard the successful PSCell change or addition information, i.e., release the UE variable *VarSuccessPSCell-Report*, 48 hours after the last successful PSCell change or addition information is added to the *VarSuccessPSCell-Report* or upon deregistration from the network as specified in TS 23.502 [43].

NEXT CHANGE

### 6.2.2 Message definitions

[Unchanged parts omitted]

#### *– SCGFailureInformation*

The *SCGFailureInformation* message is used to provide information regarding NR SCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to Network

*SCGFailureInformation* message

-- ASN1START

-- TAG-SCGFAILUREINFORMATION-START

SCGFailureInformation ::= SEQUENCE {

 criticalExtensions CHOICE {

 scgFailureInformation SCGFailureInformation-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

SCGFailureInformation-IEs ::= SEQUENCE {

 failureReportSCG FailureReportSCG OPTIONAL,

 nonCriticalExtension SCGFailureInformation-v1590-IEs OPTIONAL

}

SCGFailureInformation-v1590-IEs ::= SEQUENCE {

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

FailureReportSCG ::= SEQUENCE {

 failureType ENUMERATED {

 t310-Expiry, randomAccessProblem,

 rlc-MaxNumRetx,

 synchReconfigFailureSCG, scg-ReconfigFailure,

 srb3-IntegrityFailure, other-r16, spare1},

 measResultFreqList MeasResultFreqList OPTIONAL,

 measResultSCG-Failure OCTET STRING (CONTAINING MeasResultSCG-Failure) OPTIONAL,

 ...,

 [[

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 failureType-v1610 ENUMERATED {scg-lbtFailure-r16, beamFailureRecoveryFailure-r16,

 t312-Expiry-r16, bh-RLF-r16, beamFailure-r17, spare3, spare2, spare1} OPTIONAL

 ]],

 [[

 previousPSCellId-r17 SEQUENCE {

 physCellId-r17 PhysCellId,

 carrierFreq-r17 ARFCN-ValueNR

 } OPTIONAL,

 failedPSCellId-r17 SEQUENCE {

 physCellId-r17 PhysCellId,

 carrierFreq-r17 ARFCN-ValueNR

 } OPTIONAL,

 timeSCGFailure-r17 INTEGER (0..1023) OPTIONAL,

 perRAInfoList-r17 PerRAInfoList-r16 OPTIONAL

 ]],

 [[

 perRAInfoList-v17b0 PerRAInfoList-v1660 OPTIONAL

 ]],

 [[

 perRAInfoList-v1840 PerRAInfoList-v1800 OPTIONAL

 ]],

 [[

 choWithCandidateSCGInfoList-r19::= SEQUENCE (SIZE (1..maxNrofCondCells-r16)) OF ChoWithCandidateSCGInfo-r19 OPTIONAL

 ]]

}

MeasResultFreqList ::= SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2NR

-- TAG-SCGFAILUREINFORMATION-STOP

-- ASN1STOP

| *SCGFailureInformation field descriptions* |
| --- |
| ***measResultFreqList***The field contains available results of measurements on NR frequencies the UE is configured to measure by *measConfig*. |
| ***measResultSCG-Failure***The field contains the *MeasResultSCG-Failure* IE which includes available results of measurements on NR frequencies the UE is configured to measure by the NR SCG *RRCReconfiguration* message.  |
| ***previousPSCellId***This field indicates the physical cell id and carrier frequency of the cell that is the source PSCell of the last PSCell change. In case of PSCell addition failure, this field is absent. |
| ***failedPSCellId***This field indicates the physical cell id and carrier frequency of the cell in which SCG failure is detected or the target PSCell of the failed PSCell change or failed PSCell addition. |
| ***timeSCGFailure***This field is used to indicate the time elapsed since the last execution of *RRCReconfiguration* with *reconfigurationWithSync* for the SCG until the SCG failure. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |

[Unchanged parts omitted]

#### – *UEInformationRequest*

The *UEInformationRequest* message is used by the network to retrieve information from the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*UEInformationRequest message*

-- ASN1START

-- TAG-UEINFORMATIONREQUEST-START

UEInformationRequest-r16 ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 ueInformationRequest-r16 UEInformationRequest-r16-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

UEInformationRequest-r16-IEs ::= SEQUENCE {

 idleModeMeasurementReq-r16 ENUMERATED{true} OPTIONAL, -- Need N

 logMeasReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

 connEstFailReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

 ra-ReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

 rlf-ReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

 mobilityHistoryReportReq-r16 ENUMERATED {true} OPTIONAL, -- Need N

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension UEInformationRequest-v1700-IEs OPTIONAL

}

UEInformationRequest-v1700-IEs ::= SEQUENCE {

 successHO-ReportReq-r17 ENUMERATED {true} OPTIONAL, -- Need N

 coarseLocationRequest-r17 ENUMERATED {true} OPTIONAL, -- Need N

 nonCriticalExtension UEInformationRequest-v1800-IEs OPTIONAL

}

UEInformationRequest-v1800-IEs ::= SEQUENCE {

 flightPathInfoReq-r18 FlightPathInfoReportConfig-r18 OPTIONAL, -- Need N

 successPSCell-ReportReq-r18 ENUMERATED {true} OPTIONAL, -- Need N

 reselectionMeasurementReq-r18 ENUMERATED {true} OPTIONAL, -- Need N

 validatedMeasurementsReq-r18 ENUMERATED {true} OPTIONAL, -- Need N

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

FlightPathInfoReportConfig-r18 ::= SEQUENCE {

 maxWayPointNumber-r18 INTEGER (1..maxWayPoint-r18),

 includeTimeStamp-r18 ENUMERATED {true} OPTIONAL -- Need N

}

-- TAG-UEINFORMATIONREQUEST-STOP

-- ASN1STOP

|  |
| --- |
| *UEInformationRequest-IEs* field descriptions |
| ***coarseLocationRequest***This field is used to request UE to report coarse location information. |
| ***connEstFailReportReq***This field is used to indicate whether the UE shall report information about the connection failure. |
| ***flightPathInfoReq***This field is used to indicate whether the UE shall report the flight path information, if available, and to specify the flight path information report configuration. |
| ***idleModeMeasurementReq***This field indicates that the UE shall report the idle/inactive measurement information, if available, to the network in the *UEInformationResponse* message.  |
| ***logMeasReportReq***This field is used to indicate whether the UE shall report information about logged measurements. |
| ***mobilityHistoryReportReq***This field is used to indicate whether the UE shall report information about mobility history information. |
| ***ra-ReportReq***This field is used to indicate whether the UE shall report information about the random access procedure. |
| ***reselectionMeasurementReq***This field indicates that the UE shall report the reselection measurement information, if available, to the network in the *UEInformationResponse* message.  |
| ***rlf-ReportReq***This field is used to indicate whether the UE shall report information about the radio link failure. |
| ***successHO-ReportReq***This field is used to indicate whether the UE shall report information about the successful handover report. |
| ***successPSCell-ReportReq***This field is used to indicate whether the UE shall report information about the successful PSCell change or addition report. |

| *FlightPathInfoReportConfig* field descriptions |
| --- |
| ***includeTimeStamp***Indicates whether time stamp of each way point can be reported in the flight path information report if time stamp information is available at the UE. |
| ***maxWayPointNumber***Indicates the maximum number of way points UE can include in the flight path information report if this information is available at the UE.  |

#### – *UEInformationResponse*

The *UEInformationResponse* message is used by the UE to transfer information requested by the network.

Signalling radio bearer: SRB1 or SRB2 (when logged measurement information is included)

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to network

*UEInformationResponse message*

-- ASN1START

-- TAG-UEINFORMATIONRESPONSE-START

UEInformationResponse-r16 ::= SEQUENCE {

 rrc-TransactionIdentifier RRC-TransactionIdentifier,

 criticalExtensions CHOICE {

 ueInformationResponse-r16 UEInformationResponse-r16-IEs,

 criticalExtensionsFuture SEQUENCE {}

 }

}

UEInformationResponse-r16-IEs ::= SEQUENCE {

 measResultIdleEUTRA-r16 MeasResultIdleEUTRA-r16 OPTIONAL,

 measResultIdleNR-r16 MeasResultIdleNR-r16 OPTIONAL,

 logMeasReport-r16 LogMeasReport-r16 OPTIONAL,

 connEstFailReport-r16 ConnEstFailReport-r16 OPTIONAL,

 ra-ReportList-r16 RA-ReportList-r16 OPTIONAL,

 rlf-Report-r16 RLF-Report-r16 OPTIONAL,

 mobilityHistoryReport-r16 MobilityHistoryReport-r16 OPTIONAL,

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension UEInformationResponse-v1700-IEs OPTIONAL

}

UEInformationResponse-v1700-IEs ::= SEQUENCE {

 successHO-Report-r17 SuccessHO-Report-r17 OPTIONAL,

 connEstFailReportList-r17 ConnEstFailReportList-r17 OPTIONAL,

 coarseLocationInfo-r17 OCTET STRING OPTIONAL,

 nonCriticalExtension UEInformationResponse-v1800-IEs OPTIONAL

}

UEInformationResponse-v1800-IEs ::= SEQUENCE {

 flightPathInfoReport-r18 FlightPathInfoReport-r18 OPTIONAL,

 successPSCell-Report-r18 SuccessPSCell-Report-r18 OPTIONAL,

 measResultReselectionNR-r18 MeasResultIdleNR-r16 OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

FlightPathInfoReport-r18 ::= SEQUENCE (SIZE (0..maxWayPoint-r18)) OF WayPoint-r18

WayPoint-r18 ::= SEQUENCE {

 wayPointLocation-r18 OCTET STRING,

 timeStamp-r18 AbsoluteTimeInfo-r16 OPTIONAL

}

LogMeasReport-r16 ::= SEQUENCE {

 absoluteTimeStamp-r16 AbsoluteTimeInfo-r16,

 traceReference-r16 TraceReference-r16,

 traceRecordingSessionRef-r16 OCTET STRING (SIZE (2)),

 tce-Id-r16 OCTET STRING (SIZE (1)),

 logMeasInfoList-r16 LogMeasInfoList-r16,

 logMeasAvailable-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableBT-r16 ENUMERATED {true} OPTIONAL,

 logMeasAvailableWLAN-r16 ENUMERATED {true} OPTIONAL,

 ...

}

LogMeasInfoList-r16 ::= SEQUENCE (SIZE (1..maxLogMeasReport-r16)) OF LogMeasInfo-r16

LogMeasInfo-r16 ::= SEQUENCE {

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 relativeTimeStamp-r16 INTEGER (0..7200),

 servCellIdentity-r16 CGI-Info-Logging-r16 OPTIONAL,

 measResultServingCell-r16 MeasResultServingCell-r16 OPTIONAL,

 measResultNeighCells-r16 SEQUENCE {

 measResultNeighCellListNR MeasResultListLogging2NR-r16 OPTIONAL,

 measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

 },

 anyCellSelectionDetected-r16 ENUMERATED {true} OPTIONAL,

 ...,

 [[

 inDeviceCoexDetected-r17 ENUMERATED {true} OPTIONAL

 ]]

}

ConnEstFailReport-r16 ::= SEQUENCE {

 measResultFailedCell-r16 MeasResultFailedCell-r16,

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 measResultNeighCells-r16 SEQUENCE {

 measResultNeighCellListNR MeasResultList2NR-r16 OPTIONAL,

 measResultNeighCellListEUTRA MeasResultList2EUTRA-r16 OPTIONAL

 },

 numberOfConnFail-r16 INTEGER (1..8),

 perRAInfoList-r16 PerRAInfoList-r16,

 timeSinceFailure-r16 TimeSinceFailure-r16,

 ...

}

ConnEstFailReportList-r17 ::= SEQUENCE (SIZE (1..maxCEFReport-r17)) OF ConnEstFailReport-r16

MeasResultServingCell-r16 ::= SEQUENCE {

 resultsSSB-Cell MeasQuantityResults,

 resultsSSB SEQUENCE{

 best-ssb-Index SSB-Index,

 best-ssb-Results MeasQuantityResults,

 numberOfGoodSSB INTEGER (1..maxNrofSSBs-r16)

 } OPTIONAL

}

MeasResultFailedCell-r16 ::= SEQUENCE {

 cgi-Info CGI-Info-Logging-r16,

 measResult-r16 SEQUENCE {

 cellResults-r16 SEQUENCE{

 resultsSSB-Cell-r16 MeasQuantityResults

 },

 rsIndexResults-r16 SEQUENCE{

 resultsSSB-Indexes-r16 ResultsPerSSB-IndexList

 }

 }

}

RA-ReportList-r16 ::= SEQUENCE (SIZE (1..maxRAReport-r16)) OF RA-Report-r16

RA-Report-r16 ::= SEQUENCE {

 cellId-r16 CHOICE {

 cellGlobalId-r16 CGI-Info-Logging-r16,

 pci-arfcn-r16 PCI-ARFCN-NR-r16

 },

 ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

 raPurpose-r16 ENUMERATED {accessRelated, beamFailureRecovery, reconfigurationWithSync, ulUnSynchronized,

 schedulingRequestFailure, noPUCCHResourceAvailable, requestForOtherSI,

 msg3RequestForOtherSI-r17, lbt-Failure-r18, spare7, spare6, spare5, spare4, spare3,

 spare2, spare1},

 ...,

 [[

 spCellID-r17 CGI-Info-Logging-r16 OPTIONAL

 ]],

 [[

 sdt-Failed-r18 ENUMERATED {true} OPTIONAL

 ]] ,

 [[

 sdt-FailureCause-r19 ENUMERATED {t319a-expiry, maxRetxThreshold, preambleTransMax, configuredGrantTimer, cg-SDT-TimeAlignmentTimer, cellReselection, spare2, spare1} OPTIONAL,

 sdt-DL-RsrpInfo-r19 RSRP-Range OPTIONAL,

 sdt-UL-DataVolume-r19 INTEGER (0..xxxx) OPTIONAL,

 timeSinceSdtExecution-r19 TimeSinceFailure-r16 OPTIONAL

 ]]

Editor's note: The value range for *sdt-UL-DataVolume-r19* is FFS.

}

RA-InformationCommon-r16 ::= SEQUENCE {

 absoluteFrequencyPointA-r16 ARFCN-ValueNR,

 locationAndBandwidth-r16 INTEGER (0..37949),

 subcarrierSpacing-r16 SubcarrierSpacing,

 msg1-FrequencyStart-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 msg1-FrequencyStartCFRA-r16 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 msg1-SubcarrierSpacing-r16 SubcarrierSpacing OPTIONAL,

 msg1-SubcarrierSpacingCFRA-r16 SubcarrierSpacing OPTIONAL,

 msg1-FDM-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

 msg1-FDMCFRA-r16 ENUMERATED {one, two, four, eight} OPTIONAL,

 perRAInfoList-r16 PerRAInfoList-r16,

 ...,

 [[

 perRAInfoList-v1660 PerRAInfoList-v1660 OPTIONAL

 ]],

 [[

 msg1-SCS-From-prach-ConfigurationIndex-r16 ENUMERATED {kHz1dot25, kHz5, spare2, spare1} OPTIONAL

 ]],

 [[

 msg1-SCS-From-prach-ConfigurationIndexCFRA-r16 ENUMERATED {kHz1dot25, kHz5, spare2, spare1} OPTIONAL

 ]],

 [[

 msgA-RO-FrequencyStart-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 msgA-RO-FrequencyStartCFRA-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 msgA-SubcarrierSpacing-r17 SubcarrierSpacing OPTIONAL,

 msgA-RO-FDM-r17 ENUMERATED {one, two, four, eight} OPTIONAL,

 msgA-RO-FDMCFRA-r17 ENUMERATED {one, two, four, eight} OPTIONAL,

 msgA-SCS-From-prach-ConfigurationIndex-r17 ENUMERATED {kHz1dot25, kHz5, spare2, spare1} OPTIONAL,

 msgA-TransMax-r17 ENUMERATED {n1, n2, n4, n6, n8, n10, n20, n50, n100, n200} OPTIONAL,

 msgA-MCS-r17 INTEGER (0..15) OPTIONAL,

 nrofPRBs-PerMsgA-PO-r17 INTEGER (1..32) OPTIONAL,

 msgA-PUSCH-TimeDomainAllocation-r17 INTEGER (1..maxNrofUL-Allocations) OPTIONAL,

 frequencyStartMsgA-PUSCH-r17 INTEGER (0..maxNrofPhysicalResourceBlocks-1) OPTIONAL,

 nrofMsgA-PO-FDM-r17 ENUMERATED {one, two, four, eight} OPTIONAL,

 dlPathlossRSRP-r17 RSRP-Range OPTIONAL,

 intendedSIBs-r17 SEQUENCE (SIZE (1..maxSIB)) OF SIB-Type-r17 OPTIONAL,

 ssbsForSI-Acquisition-r17 SEQUENCE (SIZE (1..maxNrofSSBs-r16)) OF SSB-Index OPTIONAL,

 msgA-PUSCH-PayloadSize-r17 BIT STRING (SIZE (5)) OPTIONAL,

 onDemandSISuccess-r17 ENUMERATED {true} OPTIONAL

 ]],

 [[

 usedFeatureCombination-r18 ReportedFeatureCombination-r18 OPTIONAL,

 triggeredFeatureCombination-r18 ReportedFeatureCombination-r18 OPTIONAL,

 startPreambleForThisPartition-r18 INTEGER (0..63) OPTIONAL,

 numberOfPreamblesPerSSB-ForThisPartition-r18 INTEGER (1..64) OPTIONAL,

 attemptedBWP-InfoList-r18 SEQUENCE (SIZE (1..maxNrofBWPs)) OF AttemptedBWP-Info-r18 OPTIONAL,

 numberOfLBT-Failures-r18 INTEGER (1..128) OPTIONAL,

 perRAInfoList-v1800 PerRAInfoList-v1800 OPTIONAL,

 intendedSIBs-r18 SEQUENCE (SIZE (1..maxSIB)) OF SIB-Type-r18 OPTIONAL

 ]]

}

AttemptedBWP-Info-r18 ::= SEQUENCE {

 locationAndBandwidth-r18 INTEGER (0..37949),

 subcarrierSpacing-r18 SubcarrierSpacing

}

ReportedFeatureCombination-r18 ::= SEQUENCE {

 redCap-r18 ENUMERATED {true} OPTIONAL,

 smallData-r18 ENUMERATED {true} OPTIONAL,

 nsag-r18 NSAG-List-r17 OPTIONAL,

 msg3-Repetitions-r18 ENUMERATED {true} OPTIONAL,

 msg1-Repetitions-r18 ENUMERATED {true} OPTIONAL,

 eRedCap-r18 ENUMERATED {true} OPTIONAL,

 triggered-S-NSSAI-List-r18 SEQUENCE (SIZE (1..maxNrofS-NSSAI)) OF S-NSSAI OPTIONAL

}

PerRAInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAInfo-r16

PerRAInfoList-v1660 ::= SEQUENCE (SIZE (1..200)) OF PerRACSI-RSInfo-v1660

PerRAInfo-r16 ::= CHOICE {

 perRASSBInfoList-r16 PerRASSBInfo-r16,

 perRACSI-RSInfoList-r16 PerRACSI-RSInfo-r16

}

PerRAInfoList-v1800 ::= SEQUENCE (SIZE (1..200)) OF PerRAInfo-v1800

PerRAInfo-v1800 ::= CHOICE {

 perRASSBInfoList-v1800 PerRASSBInfo-v1800,

 perRACSI-RSInfoList-v1800 PerRACSI-RSInfo-v1800

}

PerRASSBInfo-r16 ::= SEQUENCE {

 ssb-Index-r16 SSB-Index,

 numberOfPreamblesSentOnSSB-r16 INTEGER (1..200),

 perRAAttemptInfoList-r16 PerRAAttemptInfoList-r16

}

PerRASSBInfo-v1800 ::= SEQUENCE {

 allPreamblesBlocked ENUMERATED {true} OPTIONAL,

 lbt-Detected-r18 ENUMERATED {true} OPTIONAL,

 ...

}

PerRACSI-RSInfo-r16 ::= SEQUENCE {

 csi-RS-Index-r16 CSI-RS-Index,

 numberOfPreamblesSentOnCSI-RS-r16 INTEGER (1..200)

}

PerRACSI-RSInfo-v1660 ::= SEQUENCE {

 csi-RS-Index-v1660 INTEGER (1..96) OPTIONAL

}

PerRACSI-RSInfo-v1800 ::= SEQUENCE {

 allPreamblesBlocked ENUMERATED {true} OPTIONAL,

 lbt-Detected-r18 ENUMERATED {true} OPTIONAL,

 ...

}

PerRAAttemptInfoList-r16 ::= SEQUENCE (SIZE (1..200)) OF PerRAAttemptInfo-r16

PerRAAttemptInfo-r16 ::= SEQUENCE {

 contentionDetected-r16 BOOLEAN OPTIONAL,

 dlRSRPAboveThreshold-r16 BOOLEAN OPTIONAL,

 ...,

 [[

 fallbackToFourStepRA-r17 ENUMERATED {true} OPTIONAL

 ]]

}

SIB-Type-r17 ::= ENUMERATED {sibType2, sibType3, sibType4, sibType5, sibType9, sibType10, sibType11, sibType12,

 sibType13, sibType14, posSIB-v1810, spare5, spare4, spare3, spare2, spare1}

SIB-Type-r18 ::= ENUMERATED {sibType15, sibType16, sibType17, sibType18, sibType19, sibType20,

 sibType21, sibType22, sibType23, sibType24, sibType25, spare5, spare4,

 spare3, spare2, spare1}

RLF-Report-r16 ::= CHOICE {

 nr-RLF-Report-r16 SEQUENCE {

 measResultLastServCell-r16 MeasResultRLFNR-r16,

 measResultNeighCells-r16 SEQUENCE {

 measResultListNR-r16 MeasResultList2NR-r16 OPTIONAL,

 measResultListEUTRA-r16 MeasResultList2EUTRA-r16 OPTIONAL

 } OPTIONAL,

 c-RNTI-r16 RNTI-Value,

 previousPCellId-r16 CHOICE {

 nrPreviousCell-r16 CGI-Info-Logging-r16,

 eutraPreviousCell-r16 CGI-InfoEUTRALogging

 } OPTIONAL,

 failedPCellId-r16 CHOICE {

 nrFailedPCellId-r16 CHOICE {

 cellGlobalId-r16 CGI-Info-Logging-r16,

 pci-arfcn-r16 PCI-ARFCN-NR-r16

 },

 eutraFailedPCellId-r16 CHOICE {

 cellGlobalId-r16 CGI-InfoEUTRALogging,

 pci-arfcn-r16 PCI-ARFCN-EUTRA-r16

 }

 },

 reconnectCellId-r16 CHOICE {

 nrReconnectCellId-r16 CGI-Info-Logging-r16,

 eutraReconnectCellId-r16 CGI-InfoEUTRALogging

 } OPTIONAL,

 timeUntilReconnection-r16 TimeUntilReconnection-r16 OPTIONAL,

 reestablishmentCellId-r16 CGI-Info-Logging-r16 OPTIONAL,

 timeConnFailure-r16 INTEGER (0..1023) OPTIONAL,

 timeSinceFailure-r16 TimeSinceFailure-r16,

 connectionFailureType-r16 ENUMERATED {rlf, hof},

 rlf-Cause-r16 ENUMERATED {t310-Expiry, randomAccessProblem, rlc-MaxNumRetx,

 beamFailureRecoveryFailure, lbtFailure-r16,

 bh-rlfRecoveryFailure, t312-expiry-r17, spare1},

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 noSuitableCellFound-r16 ENUMERATED {true} OPTIONAL,

 ra-InformationCommon-r16 RA-InformationCommon-r16 OPTIONAL,

 ...,

 [[

 csi-rsRLMConfigBitmap-v1650 BIT STRING (SIZE (96)) OPTIONAL

 ]],

 [[

 lastHO-Type-r17 ENUMERATED {cho, daps, ltm, spare1} OPTIONAL,

 timeConnSourceDAPS-Failure-r17 TimeConnSourceDAPS-Failure-r17 OPTIONAL,

 timeSinceCHO-Reconfig-r17 TimeSinceCHO-Reconfig-r17 OPTIONAL,

 choCellId-r17 CHOICE {

 cellGlobalId-r17 CGI-Info-Logging-r16,

 pci-arfcn-r17 PCI-ARFCN-NR-r16

 } OPTIONAL,

 choCandidateCellList-r17 ChoCandidateCellList-r17 OPTIONAL

 ]],

 [[

 pSCellId-r18 CHOICE {

 cellGlobalId-r18 CGI-Info-Logging-r16,

 pci-arfcn-r18 PCI-ARFCN-NR-r16

 } OPTIONAL,

 mcg-RecoveryFailureCause-r18 ENUMERATED {t316-Expiry, scg-Deactivated, spare2, spare1} OPTIONAL,

 scg-FailureCause-r18 ENUMERATED {t310-Expiry, randomAccessProblem, rlc-MaxNumRetx,

 synchReconfigFailureSCG, scg-ReconfigFailure,

 srb3-IntegrityFailure, scg-lbtFailure, beamFailureRecoveryFailure,

 t312-Expiry, bh-RLF, beamFailure, spare5, spare4, spare3, spare2, spare1 }

 OPTIONAL,

 elapsedTimeSCG-Failure-r18 ElapsedTimeSCG-Failure-r18 OPTIONAL,

 voiceFallbackHO-r18 ENUMERATED {true} OPTIONAL,

 measResultLastServCellRSSI-r18 RSSI-Range-r16 OPTIONAL,

 measResultNeighFreqListRSSI-r18 MeasResultNeighFreqListRSSI-r18 OPTIONAL,

 bwp-Info-r18 AttemptedBWP-Info-r18 OPTIONAL,

 elapsedTimeT316-r18 ElapsedTimeT316-r18 OPTIONAL,

 scg-FailedAfterMCG-r18 ENUMERATED {true} OPTIONAL
 ]],

 [[

 measResultL1LastServCell-r19 MeasResultL1-r19, OPTIONAL,

 measResultL1NeighCells-r19 MeasResultList3NR-r19 OPTIONAL,

 ltm-RecoveryCellId-r19 CHOICE {

 cellGlobalId-r19 CGI-Info-Logging-r16,

 pci-arfcn-r19 PCI-ARFCN-NR-r16

 } OPTIONAL,

 timingAdvanceEstType-r19 ENUMERATED {nw, ue} OPTIONAL,

 measResultLastServPSCell-r19 MeasResultRLFNR-r16 OPTIONAL,

 choWithCandidateSCGInfoList-r19::= SEQUENCE (SIZE (1..maxNrofCondCells-r16)) OF ChoWithCandidateSCGInfo-r19 OPTIONAL,

 ]]

 },

 eutra-RLF-Report-r16 SEQUENCE {

 failedPCellId-EUTRA CGI-InfoEUTRALogging,

 measResult-RLF-Report-EUTRA-r16 OCTET STRING,

 ...,

 [[

 measResult-RLF-Report-EUTRA-v1690 OCTET STRING OPTIONAL

 ]]

 }

}

SuccessHO-Report-r17 ::= SEQUENCE {

 sourceCellInfo-r17 SEQUENCE {

 sourcePCellId-r17 CGI-Info-Logging-r16,

 sourceCellMeas-r17 MeasResultSuccessHONR-r17 OPTIONAL,

 rlf-InSourceDAPS-r17 ENUMERATED {true} OPTIONAL

 },

 targetCellInfo-r17 SEQUENCE {

 targetPCellId-r17 CGI-Info-Logging-r16,

 targetCellMeas-r17 MeasResultSuccessHONR-r17 OPTIONAL

 },

 measResultNeighCells-r17 SEQUENCE {

 measResultListNR-r17 MeasResultList2NR-r16 OPTIONAL,

 measResultListEUTRA-r17 MeasResultList2EUTRA-r16 OPTIONAL

 } OPTIONAL,

 locationInfo-r17 LocationInfo-r16 OPTIONAL,

 timeSinceCHO-Reconfig-r17 TimeSinceCHO-Reconfig-r17 OPTIONAL,

 shr-Cause-r17 SHR-Cause-r17 OPTIONAL,

 ra-InformationCommon-r17 RA-InformationCommon-r16 OPTIONAL,

 upInterruptionTimeAtHO-r17 UPInterruptionTimeAtHO-r17 OPTIONAL,

 c-RNTI-r17 RNTI-Value OPTIONAL,

 ...,

 [[

 targetCell-PCI-ARFCN-r17 PCI-ARFCN-NR-r16 OPTIONAL

 ]],

 [[

 eutra-TargetCellInfo-r18 SEQUENCE {

 targetPCellId-r18 CHOICE {

 cellGlobalId-r18 CGI-Info-Logging-r16,

 pci-arfcn-r18 PCI-ARFCN-EUTRA-r16

 },

 targetCellMeas-r18 MeasQuantityResultsEUTRA OPTIONAL

 } OPTIONAL,

 measResultServCellRSSI-r18 RSSI-Range-r16 OPTIONAL,

 measResultNeighFreqListRSSI-r18 MeasResultNeighFreqListRSSI-r18 OPTIONAL,

 eutra-C-RNTI-r18 EUTRA-C-RNTI OPTIONAL,

 timeSinceSHR-r18 TimeSinceSHR-r18 OPTIONAL

 ]],

[[

 sourceCellMeasL1-r19 MeasResultL1-r19 OPTIONAL,

 targetCellMeasL1-r19 MeasResultL1-r19 OPTIONAL,

 neighCellsMeasL1ListNR-r19 MeasResultList3NR-r19 OPTIONAL,

 rachLess-r19 ENUMERATED {true} OPTIONAL,

 sourcePSCellInfo-r19 SEQUENCE {

 sourcePSCellId-r19 CGI-Info-Logging-r16,

 sourcePSCellMeas-r19 MeasResultSuccessHONR-r17 OPTIONAL

 },

 choWithCandidateSCGInfoList-r19::= SEQUENCE (SIZE (1..maxNrofCondCells-r16)) OF ChoWithCandidateSCGInfo-r19 OPTIONAL,

]]

}

SuccessPSCell-Report-r18 ::= SEQUENCE {

 pCellId-r18 CGI-Info-Logging-r16,

 sourcePSCellInfo-r18 SEQUENCE {

 sourcePSCellId-r18 CHOICE {

 cellGlobalId-r18 CGI-Info-Logging-r16,

 pci-arfcn-r18 PCI-ARFCN-EUTRA-r16

 },

 sourcePSCellMeas-r18 MeasResultSuccessHONR-r17 OPTIONAL

 } OPTIONAL,

 targetPSCellInfo-r18 SEQUENCE {

 targetPSCellId-r18 CHOICE {

 cellGlobalId-r18 CGI-Info-Logging-r16,

 pci-arfcn-r18 PCI-ARFCN-NR-r16

 },

 targetPSCellMeas-r18 MeasResultSuccessHONR-r17 OPTIONAL

 },

 measResultNeighCells-r18 SEQUENCE {

 measResultListNR-r18 MeasResultList2NR-r16 OPTIONAL,

 measResultListEUTRA-r18 MeasResultList2EUTRA-r16 OPTIONAL

 } OPTIONAL,

 spr-Cause-r18 SPR-Cause-r18 OPTIONAL,

 timeSinceCPAC-Reconfig-r18 TimeSinceCPAC-Reconfig-r18 OPTIONAL,

 locationInfo-r18 LocationInfo-r16 OPTIONAL,

 ra-InformationCommon-r18 RA-InformationCommon-r16 OPTIONAL,

 sn-InitiatedPSCellChange-r18 ENUMERATED {true} OPTIONAL,

...

}

MeasResultNeighFreqListRSSI-r18 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResultNeighFreqRSSI-r18

MeasResultNeighFreqRSSI-r18 ::= SEQUENCE {

 ssbFrequency-r18 ARFCN-ValueNR OPTIONAL,

 ssbSubcarrierSpacing-r18 SubcarrierSpacing OPTIONAL,

 refFreqCSI-RS-r18 ARFCN-ValueNR OPTIONAL,

 measResult-RSSI-r18 RSSI-Range-r16 OPTIONAL

}

MeasResultList2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResult2NR-r16

MeasResultList2EUTRA-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResult2EUTRA-r16

MeasResult2NR-r16 ::= SEQUENCE {

 ssbFrequency-r16 ARFCN-ValueNR OPTIONAL,

 refFreqCSI-RS-r16 ARFCN-ValueNR OPTIONAL,

 measResultList-r16 MeasResultListNR

}

MeasResultListLogging2NR-r16 ::= SEQUENCE(SIZE (1..maxFreq)) OF MeasResultLogging2NR-r16

MeasResultLogging2NR-r16 ::= SEQUENCE {

 carrierFreq-r16 ARFCN-ValueNR,

 measResultListLoggingNR-r16 MeasResultListLoggingNR-r16

}

MeasResultListLoggingNR-r16 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultLoggingNR-r16

MeasResultLoggingNR-r16 ::= SEQUENCE {

 physCellId-r16 PhysCellId,

 resultsSSB-Cell-r16 MeasQuantityResults,

 numberOfGoodSSB-r16 INTEGER (1..maxNrofSSBs-r16) OPTIONAL

}

MeasResult2EUTRA-r16 ::= SEQUENCE {

 carrierFreq-r16 ARFCN-ValueEUTRA,

 measResultList-r16 MeasResultListEUTRA

}

MeasResultRLFNR-r16 ::= SEQUENCE {

 measResult-r16 SEQUENCE {

 cellResults-r16 SEQUENCE{

 resultsSSB-Cell-r16 MeasQuantityResults OPTIONAL,

 resultsCSI-RS-Cell-r16 MeasQuantityResults OPTIONAL

 },

 rsIndexResults-r16 SEQUENCE{

 resultsSSB-Indexes-r16 ResultsPerSSB-IndexList OPTIONAL,

 ssbRLMConfigBitmap-r16 BIT STRING (SIZE (64)) OPTIONAL,

 resultsCSI-RS-Indexes-r16 ResultsPerCSI-RS-IndexList OPTIONAL,

 csi-rsRLMConfigBitmap-r16 BIT STRING (SIZE (96)) OPTIONAL

 } OPTIONAL

 }

}

MeasResultSuccessHONR-r17::= SEQUENCE {

 measResult-r17 SEQUENCE {

 cellResults-r17 SEQUENCE{

 resultsSSB-Cell-r17 MeasQuantityResults OPTIONAL,

 resultsCSI-RS-Cell-r17 MeasQuantityResults OPTIONAL

 },

 rsIndexResults-r17 SEQUENCE{

 resultsSSB-Indexes-r17 ResultsPerSSB-IndexList OPTIONAL,

 resultsCSI-RS-Indexes-r17 ResultsPerCSI-RS-IndexList OPTIONAL

 }

 }

}

ChoCandidateCellList-r17 ::= SEQUENCE(SIZE (1..maxNrofCondCells-r16)) OF ChoCandidateCell-r17

ChoCandidateCell-r17 ::= CHOICE {

 cellGlobalId-r17 CGI-Info-Logging-r16,

 pci-arfcn-r17 PCI-ARFCN-NR-r16

}

SHR-Cause-r17 ::= SEQUENCE {

 t304-cause-r17 ENUMERATED {true} OPTIONAL,

 t310-cause-r17 ENUMERATED {true} OPTIONAL,

 t312-cause-r17 ENUMERATED {true} OPTIONAL,

 sourceDAPS-Failure-r17 ENUMERATED {true} OPTIONAL,

 ...

}

SPR-Cause-r18 ::= SEQUENCE {

 t304-cause-r18 ENUMERATED {true} OPTIONAL,

 t310-cause-r18 ENUMERATED {true} OPTIONAL,

 t312-cause-r18 ENUMERATED {true} OPTIONAL,

 ...

}

MeasResultL1-r19 ::= SEQUENCE {

 resultsSSB-Indexes-r19 ResultsPerSSB-IndexList OPTIONAL,

 ...

}

MeasResultList3NR-r19 ::= SEQUENCE (1..maxFreq) OF MeasResult3NR-r19

MeasResult3NR-r19 ::= SEQUENCE {

 ssbFrequency-r16 ARFCN-ValueNR OPTIONAL,

 l1MeasResultList-r19 L1MeasResultList-r19,

 ...

}

L1MeasResultList-r19 ::= SEQUENCE (1..maxCellReport) OF L1MeasResultPerCell-r19

L1MeasResultPerCell-r19 ::= SEQUENCE {

 physCellId PhyCellId,

 resultsSSB-Indexes ResultsPerSSB-IndexList OPTIONAL

 ...

}

TimeSinceFailure-r16 ::= INTEGER (0..172800)

MobilityHistoryReport-r16 ::= VisitedCellInfoList-r16

TimeUntilReconnection-r16 ::= INTEGER (0..172800)

TimeSinceCHO-Reconfig-r17 ::= INTEGER (0..1023)

TimeSinceCPAC-Reconfig-r18 ::= INTEGER (0.. 1023)

TimeConnSourceDAPS-Failure-r17 ::= INTEGER (0..1023)

UPInterruptionTimeAtHO-r17 ::= INTEGER (0..1023)

ElapsedTimeT316-r18 ::= INTEGER (0..2000)

ElapsedTimeSCG-Failure-r18 ::= INTEGER (0..1023)

TimeSinceSHR-r18 ::= INTEGER (0..172800)

-- TAG-UEINFORMATIONRESPONSE-STOP

-- ASN1STOP

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| *UEInformationResponse-IEs* field descriptions |
| ***coarseLocationInfo***Parameter type Ellipsoid-Point defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. The least significant bits of *degreesLatitude* and *degreesLongitude* are set to 0 to meet the accuracy requirement corresponds to a granularity of approximately 2 km.It is up to UE implementation how many LSBs are set to 0 to meet the accuracy requirement. |
| ***connEstFailReport***This field is used to provide connection establishment failure or connection resume failure information*.* |
| ***connEstFailReportList***This field is used to provide the list of *connEstFailReport* that are stored by the UE for the past up to *maxCEFReport-r17.* |
| ***flightPathInfoReport***This field is used to provide the flight path information as list of waypoints and, if available, corresponding timestamps. List of size zero indicates the previously provided flight path information is no longer valid. |
| ***logMeasReport***This field is used to provide the measurement results stored by the UE associated to logged MDT.  |
| ***measResultIdleEUTRA***EUTRA measurement results performed during RRC\_INACTIVE or RRC\_IDLE. |
| ***measResultIdleNR***NR measurement results performed during RRC\_INACTIVE or RRC\_IDLE. |
| ***ra-ReportList***This field is used to provide the list of RA reports that is stored by the UE for up to *maxRAReport-r16* number of random access procedures. If the UE is an eRedCap UE, this field is used to provide the list of RA reports that is stored by the UE for up to 2 number of random access procedures. |
| ***rlf-Report***This field is used to indicate the RLF report related contents. |
| ***successHO-Report***This field is used to provide the successful handover report if triggered based on the successful handover configuration. |
| ***successPSCell-Report***This field is used to provide the successful PSCell change or addition report if triggered based on the successful PSCell change or addition report configuration. |

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| *LogMeasReport* field descriptions |
| ***absoluteTimeStamp***Indicates the absolute time when the logged measurement configuration logging is provided, as indicated by NR within *absoluteTimeInfo*. |
| ***anyCellSelectionDetected***This field is used to indicate the detection of *any cell selection* state, as defined in TS 38.304 [20]. The UE sets this field when performing the logging of measurement results in RRC\_IDLE or RRC\_INACTIVE and there is no suitable cell or no acceptable cell. |
| ***inDeviceCoexDetected***Indicates that measurement logging is suspended due to IDC problem detection. |
| ***measResultServingCell***This field refers to the log measurement results taken in the Serving cell. |
| ***numberOfGoodSSB***Indicates the number of good beams (beams that are above *absThreshSS-BlocksConsolidation,* if configured by the network) associated to the cells within the R value range (which is configured by network for cell reselection) of the highest ranked cell as part of the beam level measurements. If the UE has no SSB of a neighbour cell whose measurement quantity is above the *absThreshSS-BlocksConsolidation* or if the network has not configured the *absThreshSS-BlocksConsolidation*, then the UE does not include *numberOfGoodSSB* for the corresponding neighbour cell. If the UE has no SSB of the serving cell whose measurement quantity is above the *absThreshSS-BlocksConsolidation* or if the network has not configured the *absThreshSS-BlocksConsolidation*, then the UE shall set the *numberOfGoodSSB* for the serving cell to one. |
| ***relativeTimeStamp***Indicates the time of logging measurement results, measured relative to the *absoluteTimeStamp*. Value in seconds. |
| ***tce-Id***Parameter Trace Collection Entity Id: See TS 32.422 [52]. |
| ***traceRecordingSessionRef***Parameter Trace Recording Session Reference: See TS 32.422 [52]. |

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| *ConnEstFailReport* field descriptions |
| ***measResultFailedCell***This field refers to the last measurement results taken in the cell, where connection establishment failure or connection resume failure happened. |
| ***measResultNeighCells***This field refers to the neighbour cell measurements when connection establishment failure or connection resume failure happened. |
| ***numberOfConnFail***This field is used to indicate the latest number of consecutive failed RRCSetup or RRCResume procedures in the same cell independent of RRC state transition. |
| ***timeSinceFailure***This field is used to indicate the time that elapsed since the connection (establishment or resume) failure. Value in seconds. The maximum value 172800 means 172800s or longer. |

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| *RA-InformationCommon* field descriptions |
| ***absoluteFrequencyPointA***This field indicates the absolute frequency position of the reference resource block (Common RB 0). |
| ***allPreamblesBlocked***This field is included when the all the preamble transmission attempts in the corresponding beam (SSB or CSI-RS) are blocked by failed LBT. |
| ***attemptedBWP-InfoList***This field indicates *locationAndBandwidth* and *subcarrierSpacing* of all the bandwidth parts in which the consistent LBT failures are triggered at the moment of successful RA completion. |
| ***locationAndBandwidth***Frequency domain location and bandwidth of the bandwidth part associated to the random-access resources used by the UE or of the bandwidth part in which the consistent LBT failures is triggered and not cancelled prior to successful completion of random access procedure (if this field is included in *attemptedBWP-InfoList*) or prior to RLF/HOF (if this field is included in *attemptedBWP-InfoList* or *bwp-Info*). |
| ***numberOfLBT-Failures***This field is used to indicate the total number of preamble transmission attempts for which LBT failure indication is received in the RA procedure. If the number of LBT failure indications received from lower layers during the RA procedure exceeds or equals to 128, UE sets the field to 128.This field is optional present when there is at least one preamble transmission attempt for which LBT failure indication is received during the RA procedure, otherwise it is absent. |
| ***numberOfPreamblesPerSSB-ForThisPartition***This field determines how many consecutive preambles are associated to the used feature or combination of features starting from the starting preamble(s) per SSB. |
| ***perRAInfoList, perRAInfoList-v1660***This field provides detailed information about each of the random access attempts in the chronological order of the random access attempts. If perRAInfoList-v1660 is present, it shall contain the same number of entries, listed in the same order as in perRAInfoList-r16. |
| ***startPreambleForThisPartition***This field indicates the first preamble associated with the used feature or combination of features. |
| ***subcarrierSpacing***Subcarrier spacing used in the bandwidth part associated to the random-access resources used by the UE or of the bandwidth part in which the consistent LBT failures is triggered and not cancelled prior to successful completion of random access procedure (if this field is included in *attemptedBWP-InfoList*) or prior to RLF/HOF (if this field is included in *attemptedBWP-InfoList* or *bwp-Info*). |
| ***triggeredFeatureCombination***One or more features (e.g., *RedCap*, *Slicing*, *SDT* and *MSG3 repetition)* that triggers the random-access procedure. When triggered feature is *Slicing*, UE includes all the S-NSSAIs associated to the slices triggering the access attempt in the random-access procedure. |
| ***usedFeatureCombination***The feature or combination of features (e.g., *redCap*, *smallData*, *nsag* and *msg3-Repetitions*) associated to the used random-access resources as specified in TS 38.321[3]. |

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| *RA-Report* field descriptions |
| ***cellID***This field indicates the CGI of the cell in which the associated random access procedure was performed. |
| ***contentionDetected***This field is used to indicate that contention was detected for the transmitted preamble in the given random access attempt or not. This field is not included when the UE performs random access attempt is using contention free random-access resources or when the *raPurpose* is set to *requestForOtherSI* or when the RA attempt is a 2-step RA attempt and fallback to 4-step RA did not occur (i.e. *fallbackToFourStepRA* is not included). |
| ***csi-RS-Index, csi-RS-Index-v1660***This field is used to indicate the CSI-RS index corresponding to the random access attempt.If the random access procedure is for beam failure recovery, the field indicates the NZP-CSI-RS-ResourceId. For CSI-RS index larger than maxNrofCSI-RS-ResourcesRRM-1, the index value is the sum of csi-RS-Index (without suffix) and csi-RS-Index-v1660. |
| ***dlPathlossRSRP***Measeured RSRP of the DL pathloss reference obtained at the time of *RA\_Type* selection stage of the RA procedure as captured in TS 38.321 [3]. |
| ***dlRSRPAboveThreshold***In 4 step random access procedure, this field is used to indicate whether the DL beam (SSB) quality associated to the random access attempt was above or below the threshold *rsrp-ThresholdSSB* in *beamFailureRecoveryConfig* in UL BWP configuration of UL BWP selected for random access procedure initiated for beam failure recovery; Otherwise, if the UE has received *rsrp-ThresholdSSB* in *FeatureCombinationPreambles* used for the feature specific random access, the field is used to indicate whether DL beam (SSB) quality associated to the random access attempt was above or below this *rsrp-ThresholdSSB-r17*, else *rsrp-ThresholdSSB* in *rach-ConfigCommon* in UL BWP configuration of UL BWP selected for random access procedure.In 2 step random access procedure, if the UE has received *msgA-RSRP-ThresholdSSB* in *FeatureCombinationPreambles* used for the feature specific random access, the field is used to indicate whetherDL beam (SSB) quality associated to the random access attempt was above or below this *rsrp-ThresholdSSB-r17*, else this field is used to indicate whether the DL beam (SSB) quality associated to the random access attempt was above or below the threshold *msgA-RSRP-ThresholdSSB* in *rach-ConfigCommonTwoStepRA* in UL BWP configuration of UL BWP selected for random access procedure. |
| ***fallbackToFourStepRA***This field indicates if a fallback indication in MsgB is received (according to TS 38.321 [3]) for the 2-step random access attempt. |
| ***intendedSIBs***This field indicates the SIB(s) the UE wanted to receive as a result of the on demand SI request (when the RA procedure is a used as a SI request) initiated by the UE. That is, it indicates the one(s) of the SIB(s) in the SI message(s) requested to be broadcast that the UE was interested in. |
| ***lbt-Detected***This field is included when there is at least one LBT failure indication received prior to change of beam for preamble transmission during RA procedure, otherwise this field is absent. |
| ***msg1-SCS-From-prach-ConfigurationIndex***This field is set by the UE with the corresponding SCS for CBRA as derived from the *prach-ConfigurationIndex* in *RACH-ConfigGeneric* when the *msg1-SubcarrierSpacing* is absent; otherwise, this field is absent. |
| ***msg1-SCS-From-prach-ConfigurationIndexCFRA***This field is set by the UE with the corresponding SCS for CFRA as derived from the *prach-ConfigurationIndex* in *RACH-ConfigGeneric* when the *msg1-SubcarrierSpacing* is absent; otherwise, this field is absent. |
| ***msgA-PUSCH-PayloadSize***This field indicates the size of the overall payload available in the UE buffer at the time of initiating the 2 step RA procedure. The value refers to the index of TS 38.321 [3], table 6.1.3.1-1, corresponding to the UE buffer size. |
| ***msgA-RO-FDM***This field indicates the number of msgA PRACH transmission occasions Frequency-Division Multiplexed in one time instance for the PRACH resources configured for 2-step CBRA.. |
| ***msgA-RO-FDMCFRA***This field indicates the number of msgA PRACH transmission occasions Frequency-Division Multiplexed in one time instance for the PRACH resources configured for 2-step CFRA. |
| ***msgA-RO-FrequencyStart***This field indicates the lowest resource block of the contention based random-access resources for 2-step CBRA in the random-access procedure. The indication has the form of the offset of the lowest PRACH transmissions occasion with respect to PRB 0 in the frequency domain. |
| ***msgA-RO-FrequencyStartCFRA***This field indicates the lowest resource block of the contention free random-access resources for the 2-step CFRA in the random-access procedure. The indication has the form of the offset of the lowest PRACH transmissions occasion with respect to PRB 0 in the frequency domain. |
| ***msgA-SCS-From-prach-ConfigurationIndex***This field is set by the UE with the corresponding SCS as derived from the *msgA-PRACH-ConfigurationIndex* in *RACH-ConfigGenericTwoStepRA* (see tables Table 6.3.3.1-1, Table 6.3.3.1-2, Table 6.3.3.2-2 and Table 6.3.3.2-3, TS 38.211 [16]) when the *msgA-SubcarrierSpacing* is absent and when only 2-step random-access resources are available in the UL BWP used in the random-access procedure; otherwise, this field is absent. |
| ***numberOfPreamblesSentOnCSI-RS***This field is used to indicate the total number of successive RA preambles that were transmitted on the corresponding CSI-RS. |
| ***numberOfPreamblesSentOnSSB***This field is used to indicate the total number of successive RA preambles that were transmitted on the corresponding SS/PBCH block. |
| ***onDemandSISuccess***This field is set to *true* when the RA report entry is included because of either msg1 based on demand SI request or msg3 based on demand SI request and if the on-demand SI request is successful. Otherwise, the field is absent. |
| ***perRAAttemptInfoList***This field provides detailed information about a random access attempt. |
| ***perRACSI-RSInfoList***This field provides detailed information about the successive random access attempts associated to the same CSI-RS. |
| ***perRASSBInfoList***This field provides detailed information about the successive random access attempts associated to the same SS/PBCH block. |
| ***ra-InformationCommon***This field is used to provide information on random access attempts. This field is mandatory present. |
| ***raPurpose***This field is used to indicate the RA scenario for which the RA report entry is triggered. The RA accesses associated to Initial access from RRC\_IDLE, RRC re-establishment procedure, transition from RRC-INACTIVE. The indicator *beamFailureRecovery* is used in case of successful beam failure recovery related RA procedure in the SpCell [3]. The indicator *reconfigurationWithSync* is used if the UE executes a reconfiguration with sync. The indicator *ulUnSynchronized* is used if the random access procedure is initiated in a SpCell by DL or UL data arrival during RRC\_CONNECTED when the timeAlignmentTimer is not running in the PTAG or if the RA procedure is initiated in a serving cell by a PDCCH order [3]. The indicator *schedulingRequestFailure* is used in case of SR failures [3]. The indicator *noPUCCHResourceAvailable* is used when the UE has no valid SR PUCCH resources configured [3]. The indicator *requestForOtherSI* is used for MSG1 based on demand SI request. The indicator *msg3RequestForOtherSI* is used in case of MSG3 based SI request. The indication *lbtFailure* is used when the UE initiates RACH in SpCell due to consistent uplink LBT failures [3]. The field can also be used for the SCG-related RA-Report when the *raPurpose* is set to *beamFailureRecovery*, *reconfigurationWithSync*, *ulUnSynchronized*, *schedulingRequestFailure*, *noPUCCHResourceAvailable* and *lbtFailure*. |
| ***sdt-Failed***This field is included when the RA report entry is included because of SDT and if the SDT transmission failed. Otherwise, the field is absent. |
| ***sdt-FailureCause*** This field is included when the RA report entry is included because of SDT and if the SDT procedure failed. Otherwise, the field is absent. This field indicates the SDT failure cause.The field is set to *t319a-expiry* upon expiration of T319a timer. If the UE upper layers receive *maxRetxThreshold* reached indication from RLC while SDT procedure is ongoing, this field is set to *maxRetxThreshold*. It is set to *preambleTransMax* upon the UE upper layer receiving indication of reaching preambleTransMax from the MAC layer. Upon expiration of cg-SDT-TimeAlignmentTimer from the MAC, the field is set to *cg-SDT-TimeAlignmentTimer*. The field is set to *configuredGrantTimer* upon reception of indication that configuration grant timer has been expired from the MAC. The field is set to *cellReselection* upon SDT failure due to UE’s cell re-selection. |
| ***sdt-DL-Rsrpinfo***This field logs the RSRP value measured by UE during evaluation of SDT procedure. This field is included when the RA report entry is included because of SDT initiation failure and if the SDT procedure failed. Otherwise, the field is absent. |
| ***sdt-UL-DataVolume***This field logs the buffered data volume in the UE during evaluation of SDT procedure. This field is included when the RA report entry is included because of SDT initiation failure and if the SDT procedure failed. Otherwise, the field is absent |
| ***spCellID***This field is used to indicate the CGI of the SpCell of the cell group associated to the SCell in which the associated random access procedure was performed. If the UE performs RA procedure on a SCell associated to the MCG, then this field is set to the CGI of the PCell and if the UE performs RA procedure on a SCell associated to the SCG, then this field is set to the CGI of the PSCell. If the CGI of the PSCell is not available at the UE for the RA procedure performed on a SCell associated to the SCG or for the RA procedure on the PSCell, this field is set to the CGI of the PCell. Otherwise, the field is absent. |
| ***ssb-Index***This field is used to indicate the SS/PBCH index of the SS/PBCH block corresponding to the random access attempt. |
| ***ssbsForSI-Acquisition***This field indicates the SSB(s) (in the form of SSB index(es)) that the UE used to receive the requested SI message(s). The field is present if the purpose of the random access procedure was to request on-demand SI (i.e. if the *raPurpose* is set to *requestForOtherSI* or *msg3RequestForOtherSI*). Otherwise, the field is absent. |
| ***timeSinceSdtExecution***This field logs the elapsed time since the execution of RA-SDT. Value in seconds. The maximum value is 172800 seconds. FFS for the case beyond this value and the understanding from UE and network side, as for value beyond this range NW can not recognize the right SDT configuration.. |

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| *RLF-Report* field descriptions |
| ***bwp-Info***This field is used to indicate the BWP information in which the UE detected consistent uplink LBT failure. This field is set only when the detected consistent uplink LBT failure did not trigger the random access procedure. |
| ***choCandidateCellList***This field is used to indicate the list of candidate target cells for conditional handover included in *condRRCReconfig* at the time of connection failure. The field does not include the candidate target cells included in *measResultNeighCells*. |
| ***choCellId***This field is used to indicate the candidate target cell for conditional handover included in *condRRCReconfig* that the UE selected for CHO based recovery while T311 is running. |
| ***connectionFailureType***This field is used to indicate whether the connection failure is due to radio link failure or handover failure. |
| ***csi-rsRLMConfigBitmap,csi-rsRLMConfigBitmap-v1650***These fields are used to indicate the CSI-RS indexes configured in the RLM configurations for the active BWP when the UE declares RLF or HOF. The UE first fills in the *csi-rsRLMConfigBitmap-r16* to indicate the first 96 CSI-RS indexes and then *csi-rsRLMConfigBitmap-v1650* to indicate the latter 96 CSI-RS indexes. The first/leftmost bit in *csi-rsRLMConfigBitmap-r16* corresponds to CSI-RS index 0, the second bit corresponds to CSI-RS index 1. The first/leftmost bit in *csi-rsRLMConfigBitmap-v1650* corresponds to CSI-RS index 96, the second bit corresponds to CSI-RS index 97. These fields are included only if the *RadioLinkMonitoringConfig* for the respective BWP is configured. |
| ***c-RNTI***This field indicates the C-RNTI used in the PCell upon detecting radio link failure or the C-RNTI used in the source PCell upon handover failure. |
| ***elapsedTimeSCG-Failure***This field is used to indicate the time elapsed between the SCG failure and the MCG failure. The maximum value *1023* means 1023ms or longer. |
| ***elapsedTimeT316***This field is used to indicate the value of the elapsed time of the timer T316. Value in milliseconds. |
| ***failedPCellId***This field is used to indicate the PCell in which RLF is detected or the target PCell of the failed handover. For intra-NR handover *nrFailedPCellId* is included and for the handover from NR to EUTRA *eutraFailedPCellId* is included. The UE sets the ARFCN according to the frequency band used for transmission/ reception when the failure occurred. |
| ***failedPCellId-EUTRA***This field is used to indicate the PCell in which RLF is detected or the source PCell of the failed handover in an E-UTRA RLF report. |
| ***lastHO-Type***This field is used to indicate the type of the last executed handover or LTM cell switch before the last detected connection failure. The field is set to *cho* if the last executed handover was initiated by a conditional reconfiguration execution. The field is set to *daps* if the last executed handover was a DAPS handover. The field is set to *ltm* if the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was an LTM cell switch. |
| ***ltm-RecoveryCellId***This field is used to indicate the candidate target cell for LTM cell switch included in *ltm-Config* associated with the MCG that the UE selected for LTM based recovery while T311 was running. |
| ***mcg-RecoveryFailureCause***This field is used to indicate the cause of the fast MCG recovery failure. |
| ***measResultL1LastServCell***This field contains the last L1 measurement results collected in the PCell upon detecting radio link failure or the source PCell upon reconfiguration with sync failure when the UE is LTM configured. |
| ***measResultL1NeighCells***This field contains the last L1 measurement results collected in neighbour MCG LTM candidate cells upon reconfiguration with sync failure or upon detecting radio link failure. |
| ***measResultListEUTRA***This field refers to the last measurement results taken in the neighboring EUTRA Cells, when the radio link failure or handover failure happened. |
| ***measResultListNR***This field refers to the last measurement results taken in the neighboring NR Cells, when the radio link failure or handover failure happened. |
| ***measResultLastServCell***This field refers to the log measurement results taken in the PCell upon detecting radio link failure or the source PCell upon handover failure. |
| ***measResultLastServCellRSSI***This field refers to the log RSSI measurement results in dBm (see TS 38.215 [9]) taken for the frequency of the PCell upon detecting radio link failure or source PCell upon detecting handover failure. |
| ***measResultNeighFreqListRSSI***This field is used to log the RSSI measurement results in dBm (see TS 38.215 [9]) taken for the neighbouring frequencies upon detecting radio link failure or handover failure, when UE operates in shared spectrum. |
| ***measResult-RLF-Report-EUTRA***Includes the E-UTRA *RLF-Report-r9* IE as specified in TS 36.331 [10]. |
| ***measResult-RLF-Report-EUTRA-v1690***Includes the E-UTRA *RLF-Report-v9e0* IE as specified in TS 36.331 [10]. |
| ***noSuitableCellFound***This field is set by the UE when the T311 expires. |
| ***previousPCellId***This field is used to indicate the source PCell of the last handover (source PCell when the last executed *RRCReconfiguration* message including *reconfigurationWithSync* was received). For intra-NR handover *nrPreviousCell* is included and for the handover from EUTRA to NR *eutraPreviousCell* is included. |
| ***pSCellId***This field is used to indicate the PSCell in which the UE failed to perform fast MCG recovery procedure or the UE successfully performed fast MCG recovery procedure. |
| ***ra-InformationCommon***This field is optionally included when c*onnectionFailureType* is set to 'hof' or when *connectionFailureType* is set to 'rlf' and the *rlf-Cause* equals to 'randomAccessProblem' or 'beamRecoveryFailure'; otherwise this field is absent. |
| ***reconnectCellId***This field is used to indicate the cell in which the UE comes back to connected after connection failure and after failing to perform reestablishment, or to indicate the suitable cell in which the UE reconnects after failure in performing *MobilityFromNRCommand* for voice fallback (without initiating re-establishment procedure). If the UE comes back to RRC CONNECTED in an NR cell then *nrReconnectCellID* is included and if the UE comes back to RRC CONNECTED in an LTE cell then *eutraReconnectCellID* is included. |
| ***reestablishmentCellId***If the UE was not configured with *conditionalReconfiguration* at the time of re-establishment attempt, or if the cell selected for the re-establishment attempt is not a candidate target cell for conditional reconfiguration, this field is used to indicate the cell in which the re-establishment attempt was made after connection failure. |
| ***rlf-Cause***This field is used to indicate the cause of the last radio link failure that was detected. In case of handover failure information reporting (i.e., the *connectionFailureType* is set to '*hof*'), the UE is allowed to set this field to any value, except for the case in which a radio link failure was detected in the source PCell while performing a DAPS handover. |
| ***scg-FailedAfterMCG***This field is set if for the SCG failure is detected after MCG failure while T316 is running. |
| ***ssbRLMConfigBitmap***This field is used to indicate the SS/PBCH block indexes configured in the RLM configurations for the active BWP when the UE declares RLF or HOF.The first/leftmost bit corresponds to SSB index 0, the second bit corresponds to SSB index 1. This field is included only if the *RadioLinkMonitoringConfig* for the respective BWP is configured. |
| ***timeConnFailure***This field is used to indicate the time elapsed since the last HO or LTM cell switch execution until connection failure. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***timeConnSourceDAPS-Failure***This field is used to indicate the time that elapsed between the last DAPS handover execution and the radio link failure detected in the source cell while T304 is running. Value in milliseconds. The maximum value 1023 means 1023ms or longer. |
| ***timeSinceFailure***This field is used to indicate the time that elapsed since the connection (radio link, handover or LTM cell switch) failure. Value in seconds. The maximum value 172800 means 172800s or longer. In the case of failure(s) (either at source or at target or at both) associated to DAPS handover, this field indicates the time elapsed since the latest connection (radio link, handover or LTM cell switch) failure. |
| *timeSinceCHO-Reconfig*In case of handover failure, this field is used to indicate the time elapsed between the initiation of the last handover execution towards the target cell and the reception of the latest conditional reconfiguration. In case of radio link failure, this field is used to indicate the time elapsed between the radio link failure and the reception of the latest conditional reconfiguration while connected to the source PCell. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***timeUntilReconnection***This field is used to indicate the time that elapsed between the connection (radio link, handover or LTM cell switch) failure and the next time the UE comes to RRC CONNECTED in an NR or EUTRA cell, after failing to perform reestablishment. Value in seconds. The maximum value 172800 means 172800s or longer. |
| ***voiceFallbackHO***This field is set if for the failed mobility from NR, the *voiceFallbackIndication* was included in the *MobilityFromNRCommand* message. |
| ***timingAdvanceEstType***This field is used to indicate by which method the timing advance value used for LTM cell switch is obtained. Value *nw* indicates that the applied timing advance is signaled from LTM Cell Switch Command MAC CE, and value *ue* indicates that the applied timing advance is measured by the UE. |

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| --- |
| *SuccessHO-Report* field descriptions |
| ***c-RNTI***This field indicates the C-RNTI assigned by the target PCell of the handover for which the successful HO report was generated. |
| ***eutra-TargetCellInfo***This field is used to indicate the target EUTRA PCell and the last measurement results of the target PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***eutra-C-RNTI***This field indicates the C-RNTI assigned by the E-UTRA target PCell of the mobility from NR command for which the successful HO report was generated. |
| ***measResultListNR***This field refers to the last measurement results taken in the neighboring NR Cells when a successful handover is executed. |
| ***measResultNeighFreqListRSSI***This field is used to log the RSSI measurement results in dBm (see TS 38.215 [9]) taken for the neighbouring frequencies upon successful handover execution. |
| ***measResultServCellRSSI***This field refers to the log RSSI measurement results in dBm (see TS 38.215 [9]) taken for the frequency of the source PCell upon successful handover execution. |
| ***neighCellsMeasL1ListNR***This field refers to the last L1 measurement results taken in the neighboring NR Cells when a successful handover is executed. |
| ***rachLess***This field is set if the successful HO report is trigged by RACH-less LTM cell switch. |
| *rlf-InSourceDAPS*This field indicates whether a radio link failure occurred at the source cell while T304 was running. |
| ***shr-Cause***This field is used to indicate the cause of the successful HO report. |
| ***sourceCellMeas***This field refers to the last measurement results taken in the source PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***sourceCellMeasL1***This field refers to the last L1 measurement results taken in the source PCell of a handover in which the successful handover triggers the *SuccessHO-Report.* |
| ***sourcePCellId***This field is used to indicate the source PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***targetPCellId***This field is used to indicate the target PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***targetCellMeas***This field refers to the last measurement results taken in the target PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***targetCellMeasL1***This field refers to the last L1 measurement results taken in the target PCell of a handover in which the successful handover triggers the *SuccessHO-Report*. |
| ***timeSinceCHO-Reconfig***This field is used to indicate the time elapsed between the initiation of the last conditional reconfiguration execution towards the target cell and the reception of the latest conditional reconfiguration for this target cell. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |
| ***timeSinceSHR***This field is used to indicate the time elapsed since the execution of the last MobilityFromNRCommand towards the target EUTRA cell. Value in seconds. The maximum value 172800 means 172800s or longer. |
| ***upInterruptionTimeAtHO***This field is used to indicate the time elapsed between the time of arrival of the last PDCP PDU received from the source cell for any data radio bearer and the time of arrival of the first non-duplicate PDCP PDU received from the target cell for any data radio bearer, and it is measured at the time of arrival of the first non-duplicate PDCP PDU received from the target cell for any data radio bearer. The field is set only in case of DAPS handover.Value in milliseconds. The maximum value 1023 means 1023ms or longer. |

|  |
| --- |
| *FlightPathInfoReport* field descriptions |
| ***timeStamp***Time stamp that describes estimated time of arrival, if available, of the UE at the corresponding *wayPointLocation*. |
| ***wayPointLocation***Location coordinates of the planned waypoint. Parameter type *LocationCoordinates* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. |

|  |
| --- |
| *SuccessPSCell-Report* field descriptions |
| ***measResultListNR***This field refers to the last measurement results according to the initiating node configuration taken in the neighboring NR Cells when a successful PSCell change/addition is executed. |
| ***pCellId***This field is used to indicate the PCell to which the UE was connected when the successful PSCell change or addition triggers the *SuccessPSCell-Report*. |
| ***sn-InitiatedPSCellChange***This field indicates whether the PSCell change procedure for which the successful PSCell change report is logged is SN initiated or not. |
| ***spr-Cause***This field is used to indicate the cause of the successful PSCell change or addition report. |
| ***sourcePSCellId***This field is used to indicate the source PSCell of a PSCell change in which the successful PSCell change triggers the *SuccessPSCell-Report*. |
| ***sourcePSCellMeas***This field refers to the last measurement results taken in the source PSCell of a PSCell change in which the successful PSCell change triggers the *SuccessPSCell-Report*. |
| ***targetPSCellId***This field is used to indicate the target PSCell of a PSCell change/addition in which the successful PSCell change or addition triggers the *SuccessPSCell-Report*. |
| ***targetPSCellMeas***This field refers to the last measurement results taken in the target PSCell of a PSCell change/addition in which the successful PSCell change or addition triggers the *SuccessPSCell-Report*. |
| ***timeSinceCPAC-Reconfig***This field is used to indicate the time elapsed between the initiation of the last conditional reconfiguration execution towards the target PSCell and the reception of the latest conditional reconfiguration for this target PSCell. Actual value = field value \* 100ms. The maximum value 1023 means 102.3s or longer. |

NEXT CHANGE

## 6.3 RRC information elements

[Unchanged parts omitted]

### 6.3.2 Radio resource control information elements

[Unchanged parts omitted]

#### – *MeasResults*

The IE *MeasResults* covers measured results for intra-frequency, inter-frequency, inter-RAT mobility and measured results for NR sidelink communication/discovery/positioning.

*MeasResults* information element

-- ASN1START

-- TAG-MEASRESULTS-START

MeasResults ::= SEQUENCE {

 measId MeasId,

 measResultServingMOList MeasResultServMOList,

 measResultNeighCells CHOICE {

 measResultListNR MeasResultListNR,

 ...,

 measResultListEUTRA MeasResultListEUTRA,

 measResultListUTRA-FDD-r16 MeasResultListUTRA-FDD-r16,

 sl-MeasResultsCandRelay-r17 OCTET STRING -- Contains PC5 SL-MeasResultListRelay-r17

 } OPTIONAL,

 ...,

 [[

 measResultServFreqListEUTRA-SCG MeasResultServFreqListEUTRA-SCG OPTIONAL,

 measResultServFreqListNR-SCG MeasResultServFreqListNR-SCG OPTIONAL,

 measResultSFTD-EUTRA MeasResultSFTD-EUTRA OPTIONAL,

 measResultSFTD-NR MeasResultCellSFTD-NR OPTIONAL

 ]],

 [[

 measResultCellListSFTD-NR MeasResultCellListSFTD-NR OPTIONAL

 ]],

 [[

 measResultForRSSI-r16 MeasResultForRSSI-r16 OPTIONAL,

 locationInfo-r16 LocationInfo-r16 OPTIONAL,

 ul-PDCP-DelayValueResultList-r16 UL-PDCP-DelayValueResultList-r16 OPTIONAL,

 measResultsSL-r16 MeasResultsSL-r16 OPTIONAL,

 measResultCLI-r16 MeasResultCLI-r16 OPTIONAL

 ]],

 [[

 measResultRxTxTimeDiff-r17 MeasResultRxTxTimeDiff-r17 OPTIONAL,

 sl-MeasResultServingRelay-r17 OCTET STRING OPTIONAL,

 -- Contains PC5 SL-MeasResultRelay-r17

 ul-PDCP-ExcessDelayResultList-r17 UL-PDCP-ExcessDelayResultList-r17 OPTIONAL,

 coarseLocationInfo-r17 OCTET STRING OPTIONAL

 ]],

 [[

 altitudeUE-r18 Altitude-r18 OPTIONAL,

 cellsMetReportOnLeaveList-r18 SEQUENCE (SIZE (1..maxCellReport)) OF PhysCellId OPTIONAL

 ]]

}

MeasResultServMOList ::= SEQUENCE (SIZE (1..maxNrofServingCells)) OF MeasResultServMO

MeasResultServMO ::= SEQUENCE {

 servCellId ServCellIndex,

 measResultServingCell MeasResultNR,

 measResultBestNeighCell MeasResultNR OPTIONAL,

 ...

}

MeasResultListNR ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultNR

MeasResultNR ::= SEQUENCE {

 physCellId PhysCellId OPTIONAL,

 measResult SEQUENCE {

 cellResults SEQUENCE{

 resultsSSB-Cell MeasQuantityResults OPTIONAL,

 resultsCSI-RS-Cell MeasQuantityResults OPTIONAL

 },

 rsIndexResults SEQUENCE{

 resultsSSB-Indexes ResultsPerSSB-IndexList OPTIONAL,

 resultsCSI-RS-Indexes ResultsPerCSI-RS-IndexList OPTIONAL

 } OPTIONAL

 },

 ...,

 [[

 cgi-Info CGI-InfoNR OPTIONAL

 ]],

 [[

 choCandidate-r17 ENUMERATED {true} OPTIONAL,

 choConfig-r17 SEQUENCE (SIZE (1..2)) OF CondTriggerConfig-r16 OPTIONAL,

 triggeredEvent-r17 SEQUENCE {

 timeBetweenEvents-r17 TimeBetweenEvent-r17 OPTIONAL,

 firstTriggeredEvent-r17 ENUMERATED {condFirstEvent, condSecondEvent} OPTIONAL

 } OPTIONAL

 ]],

 [[

 entering-r18 ENUMERATED {true} OPTIONAL

 ]],

 [[

 Ltm-Candidate-r19 ENUMERATED {true} OPTIONAL

 ]]

}

MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA

MeasResultEUTRA ::= SEQUENCE {

 eutra-PhysCellId PhysCellId,

 measResult MeasQuantityResultsEUTRA,

 cgi-Info CGI-InfoEUTRA OPTIONAL,

 ...

}

MultiBandInfoListEUTRA ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicatorEUTRA

MeasQuantityResults ::= SEQUENCE {

 rsrp RSRP-Range OPTIONAL,

 rsrq RSRQ-Range OPTIONAL,

 sinr SINR-Range OPTIONAL

}

MeasQuantityResultsEUTRA ::= SEQUENCE {

 rsrp RSRP-RangeEUTRA OPTIONAL,

 rsrq RSRQ-RangeEUTRA OPTIONAL,

 sinr SINR-RangeEUTRA OPTIONAL

}

ResultsPerSSB-IndexList::= SEQUENCE (SIZE (1..maxNrofIndexesToReport2)) OF ResultsPerSSB-Index

ResultsPerSSB-Index ::= SEQUENCE {

 ssb-Index SSB-Index,

 ssb-Results MeasQuantityResults OPTIONAL

}

ResultsPerCSI-RS-IndexList::= SEQUENCE (SIZE (1..maxNrofIndexesToReport2)) OF ResultsPerCSI-RS-Index

ResultsPerCSI-RS-Index ::= SEQUENCE {

 csi-RS-Index CSI-RS-Index,

 csi-RS-Results MeasQuantityResults OPTIONAL

}

MeasResultServFreqListEUTRA-SCG ::= SEQUENCE (SIZE (1..maxNrofServingCellsEUTRA)) OF MeasResult2EUTRA

MeasResultServFreqListNR-SCG ::= SEQUENCE (SIZE (1..maxNrofServingCells)) OF MeasResult2NR

MeasResultListUTRA-FDD-r16 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA-FDD-r16

MeasResultUTRA-FDD-r16 ::= SEQUENCE {

 physCellId-r16 PhysCellIdUTRA-FDD-r16,

 measResult-r16 SEQUENCE {

 utra-FDD-RSCP-r16 INTEGER (-5..91) OPTIONAL,

 utra-FDD-EcN0-r16 INTEGER (0..49) OPTIONAL

 }

}

MeasResultForRSSI-r16 ::= SEQUENCE {

 rssi-Result-r16 RSSI-Range-r16,

 channelOccupancy-r16 INTEGER (0..100)

}

MeasResultCLI-r16 ::= SEQUENCE {

 measResultListSRS-RSRP-r16 MeasResultListSRS-RSRP-r16 OPTIONAL,

 measResultListCLI-RSSI-r16 MeasResultListCLI-RSSI-r16 OPTIONAL

}

MeasResultListSRS-RSRP-r16 ::= SEQUENCE (SIZE (1.. maxCLI-Report-r16)) OF MeasResultSRS-RSRP-r16

MeasResultSRS-RSRP-r16 ::= SEQUENCE {

 srs-ResourceId-r16 SRS-ResourceId,

 srs-RSRP-Result-r16 SRS-RSRP-Range-r16

}

MeasResultListCLI-RSSI-r16 ::= SEQUENCE (SIZE (1.. maxCLI-Report-r16)) OF MeasResultCLI-RSSI-r16

MeasResultCLI-RSSI-r16 ::= SEQUENCE {

 rssi-ResourceId-r16 RSSI-ResourceId-r16,

 cli-RSSI-Result-r16 CLI-RSSI-Range-r16

}

UL-PDCP-DelayValueResultList-r16 ::= SEQUENCE (SIZE (1..maxDRB)) OF UL-PDCP-DelayValueResult-r16

UL-PDCP-DelayValueResult-r16 ::= SEQUENCE {

 drb-Id-r16 DRB-Identity,

 averageDelay-r16 INTEGER (0..10000),

 ...

}

UL-PDCP-ExcessDelayResultList-r17 ::= SEQUENCE (SIZE (1..maxDRB)) OF UL-PDCP-ExcessDelayResult-r17

UL-PDCP-ExcessDelayResult-r17 ::= SEQUENCE {

 drb-Id-r17 DRB-Identity,

 excessDelay-r17 INTEGER (0..31),

 ...

}

TimeBetweenEvent-r17 ::= INTEGER (0..1023)

-- TAG-MEASRESULTS-STOP

-- ASN1STOP

|  |
| --- |
| *MeasResultEUTRA* field descriptions |
| ***eutra-PhysCellId***Identifies the physical cell identity of the E-UTRA cell for which the reporting is being performed. The UE reports a value in the range 0..503, other values are reserved. |

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| *MeasResultNR* field descriptions |
| ***averageDelay***Indicates average delay for the packets during the reporting period, as specified in TS 38.314 [53]. Value 0 corresponds to 0 millisecond, value 1 corresponds to 0.1 millisecond, value 2 corresponds to 0.2 millisecond, and so on. |
| ***cellResults***Cell level measurement results. |
| ***cellsMetReportOnLeaveList***This field indicates the list of cells which met the event leaving condition. |
| ***choCandidate***This field indicates whether the associated cell is a candidate target cell for conditional handover or conditional PSCell change or addition. This field may be included only in the *SuccessHO-Report* or *SuccessPSCell-Report* within *UEInformationResponse* message. |
| ***choConfig***If the associated cell is a candidate target cell for conditional handover, this field indicates the conditional handover execution condition for each *measId* within *condTriggerConfig* associated to the cell. This field may be included only in the *rlf-report* within *UEInformationResponse* message. |
| ***drb-Id***Indicates DRB value for which uplink PDCP delay ratio or value is provided, according to TS 38.314 [53]. |
| ***entering***This field indicates if the event entering condition for the cell is satisfied and the cell has been just added within *cellsTriggeredList*. |
| ***firstTriggeredEvent***This field is set to *condFirstEvent* if the execution condition associated to the first entry of *choConfig* was fulfilled first in time. This field is set to *condSecondEvent* if the execution condition associated to the second entry of *choConfig* was fulfilled first in time. This field may be included in *rlf-report* within *UEInformationResponse* message or in *SCGFailureInformation* message. |
| ***locationInfo***Positioning related information and measurements. |
| ***ltm-Candidate***This field indicates whether the associated cell is an LTM candidate cell contained in the UE configuration. This field may be included only in the *SuccessHO-Report* within *UEInformationResponse* message. |
| ***physCellId***The physical cell identity of the NR cell for which the reporting is being performed. |
| ***resultsSSB-Cell***Cell level measurement results based on SS/PBCH related measurements. |
| ***resultsSSB-Indexes***Beam level measurement results based on SS/PBCH related measurements. |
| ***resultsCSI-RS-Cell***Cell level measurement results based on CSI-RS related measurements. |
| ***resultsCSI-RS-Indexes***Beam level measurement results based on CSI-RS related measurements. |
| ***rsIndexResults***Beam level measurement results. |
| ***timeBetweenEvents***Indicates the time elapsed between fulfilling the conditional execution conditions included in *choConfig*. Value in milliseconds. The maximum value 1023 means 1023ms or longer. This field may be included in the reports associated to *UEInformationResponse* message, e.g., *rlf-Report* or in the *SCGFailureInformation* message. |

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| *MeasResultUTRA-FDD* field descriptions |
| ***physCellId***The physical cell identity of the UTRA-FDD cell for which the reporting is being performed. |
| ***utra-FDD-EcN0***According to CPICH\_Ec/No in TS 25.133 [46] for FDD. |
| ***utra-FDD-RSCP***According to CPICH\_RSCP in TS 25.133 [46] for FDD. |

| *MeasResults* field descriptions |
| --- |
| ***coarseLocationInfo***This field indicates the coarse location information reported by the UE. This field is coded as the *Ellipsoid-Point* defined in TS 37.355 [49]. The first/leftmost bit of the first octet contains the most significant bit. The least significant bits of *degreesLatitude* and *degreesLongitude* are set to 0 to meet the accuracy requirement corresponds to a granularity of approximately 2 km.It is up to UE implementation how many LSBs are set to 0 to meet the accuracy requirement |
| ***excessDelay***Indicates the ratio of packets in UL per DRB exceeding the configured delay threshold among the UL PDCP SDUs, according to the UL PDCP Excess Packet Delay per DRB mapping table, as defined in TS 38.314 [53], Table 4.3.1.e-1. |
| ***measId***Identifies the measurement identity for which the reporting is being performed. |
| ***measQuantityResults***The value sinr is not included when it is used for *LogMeasReport-r16*. |
| ***measResultCellListSFTD-NR***SFTD measurement results between the PCell and the NR neighbour cell(s) in NR standalone. |
| ***measResultCLI***CLI measurement results. |
| ***measResultEUTRA***Measured results of an E-UTRA cell. |
| ***measResultForRSSI***Includes measured RSSI result in dBm (see TS 38.215 [9]) and *channelOccupancy* which is the percentage of samples when the RSSI was above the configured *channelOccupancyThreshold* for the associated *reportConfig*. |
| ***measResultListEUTRA***List of measured results for the maximum number of reported best cells for an E-UTRA measurement identity. |
| ***measResultListNR***List of measured results for the maximum number of reported best cells for an NR measurement identity. |
| ***measResultListUTRA-FDD***List of measured results for the maximum number of reported best cells for a UTRA-FDD measurement identity. |
| ***measResultNR***Measured results of an NR cell. |
| ***measResultServFreqListEUTRA-SCG***Measured results of the E-UTRA SCG serving frequencies: the measurement result of PSCell and each SCell, if any, and of the best neighbouring cell on each E-UTRA SCG serving frequency. |
| ***measResultServFreqListNR-SCG***Measured results of the NR SCG serving frequencies: the measurement result of PSCell and each SCell, if any, and of the best neighbouring cell on each NR SCG serving frequency. |
| ***measResultServingMOList***Measured results of measured cells with reference signals indicated in the serving cell measurement objects including measurement results of SpCell, configured SCell(s) and best neighbouring cell within measured cells with reference signals indicated in on each serving cell measurement object. If the sending of the *MeasurementReport* message is triggered by a measurement configured by the field *sl-ConfigDedicatedForNR* received within an E-UTRA *RRCConnectionReconfiguration* message (i.e. CBR measurements), this field is not applicable and its contents is ignored by the network. |
| ***measResultSFTD-EUTRA***SFTD measurement results between the PCell and the E-UTRA PScell in NE-DC. |
| ***measResultSFTD-NR***SFTD measurement results between the PCell and the NR PScell in NR-DC. |
| ***measResultsSL***CBR measurements results for NR sidelink communication/discovery/positioning. |
| ***measResultUTRA-FDD***Measured result of a UTRA-FDD cell. |
| ***sl-MeasResultsCandRelay***Measurement result(s) of candiate L2 U2N relay UE(s). |
| ***sl-MeasResultServingRelay***Measurement result of serving L2 U2N relay UE. |

#### *– MeasResult2NR*

The IE *MeasResult2NR* contains measurements on NR frequencies.

*MeasResult2NR* information element

-- ASN1START

-- TAG-MEASRESULT2NR-START

MeasResult2NR ::= SEQUENCE {

 ssbFrequency ARFCN-ValueNR OPTIONAL,

 refFreqCSI-RS ARFCN-ValueNR OPTIONAL,

 measResultServingCell MeasResultNR OPTIONAL,

 measResultNeighCellListNR MeasResultListNR OPTIONAL,

 ...

}

-- TAG-MEASRESULT2NR-STOP

-- ASN1STOP

[Unchanged parts omitted]

#### *– ChoWithCandidateSCGInfo*

The IE *ChoWithCandidateSCGInfo* contains information regarding events of CHO with Candidate SCG.

*ChoWithCandidateSCGInfo* information element

-- ASN1START

-- TAG-CHOWITHCANDIDATESCGINFO-START

ChoWithCandidateSCGInfo::= SEQUENCE{

 firstFulfilledConfig-r19 ENUMERATED {cho, cpc} OPTIONAL,

 timeBetweenFulfillment-r19 TimeBetweenEvent-r17 OPTIONAL,

 timeBetweenLastFulfillmentAndEvent-r19 TimeBetweenEvent-r17 OPTIONAL,

 PcellId-r19 CHOICE {

 cellGlobalId-r19 CGI-Info-Logging-r16,

 pci-arfcn-r19 PCI-ARFCN-NR-r16

 }, OPTIONAL

 PScellId-r19 CHOICE {

 cellGlobalId-r19 CGI-Info-Logging-r16,

 pci-arfcn-r19 PCI-ARFCN-NR-r16

 }, OPTIONAL,

 MeasResults-r19 SEQUENCE {

 pCellMeas-r19 MeasResultNR OPTIONAL,

 psCellMeas-r19 MeasResultNR OPTIONAL

 }, OPTIONAL

 ...

}

-- TAG-CHOWITHCANDIDATESCGINFO-STOP

-- ASN1STOP

|  |
| --- |
| *ChoWithCandidateSCGInfo* field descriptions |
| ***firstFulfilledConfig***This field indicates if the execution conditions for conditional handover or conditional PSCell change/addition was fulfilled first. |
| ***timeBetweenFulfillment***This field logs the time between fulfilment of conditional ahndover and conditional PSCell change or addition execution conditions. |
| ***timeBetweenLastFulfillmentAndEvent***This field logs the time between fulfilment of either conditional handover and conditional PSCell change or addition execution conditions and failure for RLF and SCG failure, or the time between fulfilment of either conditional handover and conditional PSCell change or addition execution conditions and handover execution for SHR |

END OF CHANGES

# Annex

## MRO enhancements for Rel-18 mobility features – LTM

### RAN2#125-bis

* For LTM MRO, RAN2 considers the following three connection failure cases:

- Too late LTM

- Too early LTM

- LTM to wrong cell

* For too late LTM, the following sub-cases are considered but we may down prioritize later (not limiting):

- Case 1a: the UE detects RLF in source cell after receiving LTM candidate configurations and performs reestablishment procedure.

- Case 1b: the UE detects RLF in source cell after receiving LTM candidate configurations, selects an LTM candidate cell, detects HOF with the selected LTM cell.

- Case 1c: the UE detects RLF in source cell after receiving LTM candidate configurations, and successfully completes LTM execution with the selected LTM candidate cell.

* For too early LTM, the following sub-cases are considered but we may down prioritize later (not limiting):

- Case 2a: the UE detects HOF/RLF in the LTM target cell and performs reestablishment procedure with the source cell.

- Case 2b: the UE detects HOF/RLF in the LTM target cell, selects the source cell which is also an LTM candidate cell, detects HOF with the source cell, and performs reestablishment procedure.

- Case 2c: the UE detects HOF/RLF in the LTM target cell, and successfully completes LTM execution with the selected source cell which is also an LTM candidate cell.

* LTM to wrong cell, the following sub-cases are considered but we may down prioritize later (not limiting):

- Case 3a: the UE detects HOF/RLF in the LTM target cell and performs reestablishment procedure with the source cell.

- Case 3b: the UE detects HOF/RLF in the LTM target cell, selects an LTM candidate cell which is different from the source or target one, detects HOF with the selected LTM candidate cell, and performs reestablishment procedure.

- Case 3c: the UE detects HOF/RLF in the LTM target cell, and successfully completes LTM execution with the selected LTM candidate cell which is different from the source or target one.

* RAN2 considers SHR, RA report and RLF for MCG LTM SON.
* RAN2 will start work on MCG LTM.

### RAN2#126

* We correct the definition of scenario 3a as follows: Case 3a: the UE detects HOF/RLF in the LTM target cell and performs reestablishment procedure in a cell other than the source cell and the target cell.
* If available, log the L1 measurements for serving cell, target cell and other LTM candidate cells in RLF report, upon RLF or mobility failure.
* Reuse the existing approach of using timeConnFailure and the reconnectCellId in RLF-report also for LTM failures, details TBD.
* Log the LTM cell ID upon performing recovery an LTM candidate cell, details TBD e.g. which field.
* Extend lastHO-Type in RLF-Report to indicate the LTM cell switch as last executed mobility procedure.

### RAN2#127

* Only the field description associated to the timeConnFailure IE needs to be updated accordingly. Otherwise, we don’t expect any further specification impact for timeConnFailure and reconnectCellId is foreseen, TBC.
* introduce a new field in RLF report to indicate the LTM recovery cell id.
* RAN2 include the specific access type in the RLF report, i.e. whether it is RA-based or RA-less cell switch. FFS details, e.g. if explicit or implicitly signalled.
* We do not include in the RLF report, the time since the last reception of PDCCH order towards the target cell till reception of cell switch command.
* RA-based access will not be a new triggering condition for the SHR report.
* HO interruption time will not be a new triggering condition for the SHR report
* Reuse the existing approach of using timeUntilReconnection in RLF-report also for LTM failure scenarios.
* We will not define and log timeSinceLTM-Reconfig (like timeSinceCHO-Reconfig) within RLF-report and SHR in LTM failure and near failure cases.
* We will not log interruption time in SON reports (e.g. SHR) for LTM.
* We aim to log some info to deduce the ltmCandidate (similar like choCandidate) in SHR to indicate whether a neighbour cell is an LTM candidate cell or not, TBD if explicit/implicit.
* Log L3 measurements for serving cell, target cell and other LTM candidate cells in RLF report, upon RLF or mobility failure. RAN2 assumes this is already possible with existing spec.

### RAN2#127-bis

1. The UE shall log cell IDs such as reestablishment cell ID, source, failed, reconnect cell ID, following the same principle as RLF, HOF and successful recovery, incl. the time between UE executing the LTM command and the failure.
2. If RA-based LTM failure happens the UE logs and reports RACH info in the RLF report. Additional information is TBD.
3. Unless RAN3 defines a NW-based solution: The UE logs and reports whether and how the UE got the TA value used for a failed LTM switch (gNB indicated or UE determined).
4. Include an explicit indicator in SHR whether the successful LTM execution was RACH-less or RACH-based. Can sort out the details during stage-3 implementation.
5. Unless RAN3 defines a NW-based solution: Introduce an explicit indication in RLF-Report to indicate whether a neighbour cell is an LTM candidate cell.
6. UE logs available L1 measurement results for the serving cell, the target cell and other LTM candidate cells when a successful LTM cell switch triggers SHR.

### RAN2#128

1. No need to include the specific access type (i.e. RACH-based or RACH-less) in the RLF report explicitly. It can be known implicitly. This can be revisited if RAN2 concludes that there are issues.
2. Reuse the existing ra-InformationCommon for the RA-based LTM failure.
3. If RAN3 does not address this meaning that we need a RAN2 solution, add a list indicating which LTM candidates the UE had at RLF.

### RAN2#129

**Send an LS to RAN3 indicating scenario of beam failure recovery shortly after successful LTM (“near failure”), also say that we will not specify a UE based solution for this, but that RAN3 can consider a NW based solution if they want. RAN3 can see if/how the solution (if specified) could also be used for the case of LTM failure.**

## MRO enhancements for Rel-18 mobility features – CHO with candidate SCGs

### RAN2#125-bis

* RAN2 to study failure and near failure scenarios for CHO with candidate SCGs.

### RAN2#126

* RAN2 to enhance the RLF report with additional information regarding the state of the two execution conditions. We see later if we also can enhance the SCGFailureInformation report.

### RAN2#127

* UE includes following information in RLF report:

b. Time information regarding condition fulfilment for CHO with candidate SCGs. Details are FFS. We consider both the case when both CHO condition and associated CPC condition are fulfilled, and the case when CHO (or CPC) is fulfilled but CPC (or CHO) conditions are not fulfilled.

c. Measurement results of PCells and PSCells.

### RAN2#127-bis

1. UE reports the time gap between the first met condition (CHO or CPAC) and the second met condition (CPAC or CHO), and the first met execution condition (as agreed by RAN3), for a failed CHO with candidate SCGs. Details FFS.
2. Include the elapsed time between the point in time of the first fulfilled condition and RLF in RLF report. Details FFS.

### RAN2#128

1. RAN2 understands that current agreements is that the UE shall logs (in RLF report, SHR report and SCGFailureInformation) time from the last triggered event for the PCell (or PSCell) to the time to the last triggered event for the PSCell (or PCell). We don’t intend to do further or more granular enhancements.
2. Measurement results of PCells and PSCells and the time information (as agreed for RLF) are included in SHR and SCGFailureInformation also. We will check what the spec impact of this is, e.g. something in the spec today may already make the UE log this.

### RAN2#129

**Enhance RLF report for CHO with candidate SCGs to include the information for each CHO, i.e., first fulfilled event and time duration between two events fulfilled, if any.**

**Enhance RLF report for CHO with candidate SCGs to include the associations between CHO and CPAC.**

**Enhance RLF report for CHO with candidate SCGs to include at least the following information:**

**- Identifier of candidate PCell(s) which met the configured CHO execution conditions when the RLF is encountered;**

**- Identifier of candidate PSCell(s) which met the configured CPAC execution conditions when the RLF is encountered;**

**- The Identifier of candidate PCell(s) or PSCell(s) that fulfilled execution conditions before the RLF is encountered.**

**Enhance SCGFailureInformation for CHO with candidate SCGs to include the information for each CHO, i.e., first fulfilled event and time duration between two events fulfilled, if any.**

**We should avoid specifying the procedure in a way that the UE sends redundant information**

## MRO enhancements for Rel-18 mobility features – S-CPAC

### RAN2#125-bis

No agreements.

### RAN2#126

* RAN2 will look into failure and near failure scenarios for subsequent execution of SCPAC and see if/what enhancements are needed.

### RAN2#127

No agreements.

### RAN2#127-bis

No agreements.

### RAN2#128

No agreements.

### RAN2#129

No agreements.

## RACH Optimization for SDT

### RAN2#125-bis

No agreements.

### RAN2#126

* For the purpose of SON enhancements for SDT, include RSRP/data volume related information
* Downlink RSRP value and buffered uplink data volume at the time when the UE evaluates if it should perform SDT.
* When SDT failure happens, the UE can indicate the failure cause of SDT to the network, e.g. T319a expiration. Details are TBD, e.g. if RSRP and data volume can also be included in such report.

### RAN2#127

* Do not add logging of sdt-RSRP-Threshold, since already agreed by RAN3 to not support it.
* UE logs and reports the failure cause for SDT to the network. FFS the details, e.g. if we down select some of the failure causes.

### RAN2#127-bis

1. For failed SDT case, UE includes the DL RSRP and UL data volume at the time of SDT evaluation in SON report. For successful SDT procedure, the UE does not log.
2. RAN2 understands for SON/MDT R19 the SDT enhancements only relate to the RA-SDT procedure. This does not rule out the case when the UE falls back from RA-SDT.

### RAN2#128

1. The UE logs the DL RSRP and UL data volume for the failed to initiate of RA-SDT in RA report.
2. The following failure causes can be logged for failed SDT in RA report:

⁻ upon receiving indication from the MCG RLC that the maximum number of retransmissions has been reached while SDT procedure is ongoing;

⁻ upon random access problem indication is received from MCG MAC while SDT procedure is ongoing;

⁻ upon T319a expires;

⁻ upon the lower layers indicate that cg-SDT-TimeAlignmentTimer or the configuredGrantTimer expired before receiving network response for the UL CG-SDT transmission with CCCH message while SDT procedure is ongoing;

⁻ FFS: unsuccessfully completed upon cell re-selection.

### RAN2#129

**Include cell re-selection as a failure cause for failed RA-SDT in RA-Report**

**Introduce a new field in RA-Report to indicate the elapsed time since the execution of RA-SDT. Value in seconds. The maximum value is 172800 seconds.**

## MHI Enhancements for SCG Deactivation/Activation

### RAN2#125-bis

No agreements.

### RAN2#126

No agreements.

### RAN2#127

* It is beneficial for the network to have information about time spent in the PSCell in activated state vs. deactivated state.
* Send an LS to RAN3 to ask if a NW solution is good enough to achieve the agreement above, or if a UE based solution is needed.

### RAN2#127-bis

No agreements.

### RAN2#128

No agreements.

### RAN2#129

**We will introduce a UE based solution for SCG act/deact MHI, as an optional UE feature.**

**UE reports the time the UE has spent in PSCell with SCG activated, TBD details, e.g. percentage of time or absolute time, etc.**

## MRO for MR-DC SCG failure

### RAN2#125-bis

No agreements.

### RAN2#126

* Reply to RAN3 that we will only do EN-DC. RAN2 understands that whether also supporting (NG)EN-DC has no additional RAN2 impact hence RAN3 can decide. If later we get time we can consider other options.

### RAN2#127

* To support MRO for SCG failure in EN-DC, enhance SCGFailureInformationNR message to include previousPSCellId, failedPSCellId, timeSCGFailure.

### RAN2#127-bis

1. Add reporting of the following parameters for SCG failure report in EN-DC scenario:

⁻ For failedPSCellId and previousPSCellId: frequency and the PCI of the PSCell;

⁻ For timeSCGFailure: value range 0-1023;

⁻ For failureType: Reuse the legacy field.

- perRA-InfoList

### RAN2#128

No agreements.

### RAN2#129

No agreements.

## SON/MDT for NTN

### RAN2#125-bis

No agreements.

### RAN2#126

No agreements.

### RAN2#127

No agreements.

### RAN2#127-bis

No agreements.

### RAN2#128

No agreements.

### RAN2#129

**Existing IEs for CHO are used to report the fulfilled CHO trigger conditions before RLF occurs in case of “time and measurement based trigger condition” or “location and measurement based trigger condition”.**