**SLRelay Review file**

**3GPP TSG-RAN2 Meeting # 131R2-2506574**

**Bengaluru, India August 25th – 29th, 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.331** | **CR** | **5429** | **rev** | **1** | **Current version:** | **18.6.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Introduction of NR sidelink multi-hop relay | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon, CATT | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_SL\_relay\_multihop | | | | |  | ***Date:*** | | | 2025-09-01 |
|  |  | | | |  | |  | | |  |
| ***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 can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | To introduce Rel-19 NR sidelink multi-hop relay enhancements to TS 38.331 including the following aspects:  1) Relay discovery and (re)selection  2) Control Plane Procedures and SRAP impact in TS 38.331  3) Service Continuity Scenarios for muli-hop relay | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | In clause 3.1, definitions of terms including U2N Last Relay UE, U2N Intermediate Relay UE and U2N First Relay UE are introduced.  In clause 4.2.1 the Network controlled mobility is introduced for multi hop relay operation  In clause 4.2.2 SRBs handling is introduced for multi hop relay operation  In clause 4.4 RRC connection mobility is extended for multi hop relay operation  In clause 5.2 System Information handling is extended for supporting multi hop relay operation  In clause 5.3.2 Paging procedure is extended for supporting multi hop relay operation  In clause 5.3.3 RRC connection establishment procedure is extended for supporting multi hop relay operation  In clause 5.3.5 RRC reconfiguration procedure is extended for supporting multi hop relay operation  In clause 5.3.7 RRC connection re-establishment procedure is extended for supporting multi hop relay operation  In clause 5.3.10 Radio link failure related actions is extended for supporting multi hop relay operation  In clause 5.3.13 RRC connection resume procedure is extended for supporting multi hop relay operation  In clause 5.3.13 RRC connection reject procedure is extended for supporting multi hop relay operation  In clause 5.8 Sidelink procedures is extended for supporting multi hop relay operation  In clause 6.3 RRC information elements are extended for supporting multi hop relay operation  In clause 6.6 PC5 RRC messages are extended for supporting multi hop relay operation  In clause 9.3 Sidelink pre-configured parameters are extended for supporting multi hop relay operation  In clause 9.4 Radio Information Related to Discovery Message is extended for supporting multi hop relay operation | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The enhancements introduced in R19 for NR sidelink multi-hop relay cannot be supported | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.1, 4.2.1, 4.2.2, 4.4, 5.2, 5.3.2, 5.3.3, 5.3.5, 5.3.7, 5.3.10, 5.3.13, 5.3.15, 5.8, 6.3, 6.6, 9.3, 9.4 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.300 CR 1028  TS 38.351 CR 0041  TS 38.323 CR 0150  TS 38.321 CR 2101  TS 38.304 CR 0444  TS 38.306 CR 1321  TS 38.331 CR 5403 | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

==================================FIRSTCHANGE======================================

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

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

**2Rx XR UE:** Two antenna port XR UE as specified in TS 38.101-1 [15].

**A2X communication:** A communication to support A2X services leveraging PC5 reference points, as defined in TS 23.256 [76]. A2X services are realized by various types of A2X applications, e.g., BRID or DAA.

**Additional sidelink RLC bearer:** If the sidelink PDCP entity is associated with two sidelink RLC entities, the additional sidelink RLC bearer is the RLC bearer configured by *sl-RLC-BearerToAddModListSizeExt* in *sl-ConfigDedicatedNR*, or *sl-RLC-BearerConfigListSizeExt* in *SIB12* or in *SidelinkPreconfigNR*.

**Aerial UE:** UE performingAerial UE communication, as defined in TS 38.300 [2], clause 16.18 and TS 23.256 [76].

**AM MRB:** An MRB associated with at least an AM RLC bearer for PTP transmission.

**BH RLC channel:** An RLC channel between two nodes, which is used to transport backhaul packets.

**Broadcast MRB:** A radio bearer configured for MBS broadcast delivery.

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

**Child UE:** A U2N Relay UE’s next hop in downstream direction for serving a U2N Remote UE in U2N Relay communication. Child UE can be the U2N Remote UE or a U2N Relay UE.

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

**Data Burst:** A set of multiple PDUs generated and sent by the application in a short period of time, as defined in TS 23.501 [32].

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

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

**Downstream**: Direction toward child node or UE in IAB-topology or U2N Remote UE in U2N Relay communication.

**Earth-fixed cell:** An NTN cell fixed with respect to a certain geographic area on Earth. It can be provisioned by beam(s) continuously covering the same geographical area (e.g., the case of GSO satellites).

**Earth-moving cell:** An NTN cell moving on the ground. It can be provisioned by beam(s) whose coverage area slides over the Earth's surface (e.g., the case of NGSO satellites generating fixed or non-steerable beams).

**eRedCap UE:** A UE with enhanced reduced capabilities as specified in clause 4.2.22.1 in TS 38.306 [26].

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

**First U2N Relay UE**: An Intermediate U2N Relay UE having both PC5 connection to a parent UE and PC5 connection to a U2N Remote UE for serving the U2N Remote UE in case of multi-hop L2 U2N Relay communication.

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

**Frequency Selection Area ID:** An identity used for broadcast MBS session to guide the frequency selection of the UE as defined in TS 23.247 [67].

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

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

**Intermediate U2N Relay UE**: A U2N Relay UE having both PC5 connection to a parent UE and PC5 connection to a child UE or a U2N Remote UE for serving the U2N Remote UE in case of multi-hop L2 U2N Relay communication.

**Last U2N Relay UE**: A U2N Relay UE having both Uu connection to the network and PC5 connection to a child UE for serving a U2N Remote UE in case of L2 U2N Relay communication. The child UE is the U2N Remote UE in case of single-hop L2 U2N Relay communication.

**Candidate configuration:** A configuration part of an *RRCReconfiguration* message associated with a candidate cell, e.g., for LTM or subsequent CPAC. A candidate configuration can be a complete candidate configuration or a delta configuration relatively to a reference configuration.

**Reference configuration:** A configuration provided by the network to the UE that is common, within the same cell group, to a group of configured non-complete candidate configurations.

**MBS Radio Bearer:** A radio bearer that is configured for MBS delivery.

**Mobile IAB-MT**: mobile IAB-node function that terminates the Uu interface to the parent node using the procedures and behaviours specified for UEs unless stated otherwise. The mobile IAB-MT uses the same procedures and behaviours specified for the IAB-MT, unless explicitly stated otherwise.

**Mobile IAB-node**: RAN node that supports NR access links to UEs and an NR backhaul link to a parent node, and that can conduct physical mobility across the RAN area. The mobile IAB-node function used in 38-series of 3GPP Specifications corresponds to the MBSR function defined in TS 23.501 [32]. The mobile IAB-node uses the same procedures and behaviours specified for the IAB-node, unless explicitly stated otherwise.

**Multicast/Broadcast Service:** A point-to-multipoint service as defined in TS 23.247 [67].

**Multicast MRB:** A radio bearer configured for MBS multicast delivery.

**MUSIM gap:** Period that the UE may use to perform MUSIM operations.

**Multi-path:** Mode of operation of a UE in RRC\_CONNECTED configured with one direct path on which the UE connects to gNB using NR Uu, and one indirect path on which the UE connects to the same gNB via another UE using PC5 unicast link or Non-3GPP Connection.

**MP remote UE:** A UE configured with Multi-path. When the connectivity of indirect path is PC5 unicast link, the MP remote UE is acting as a L2 U2N Remote UE. When the connectivity of indirect path is Non-3GPP Connection, the MP remote UE is acting as a N3C remote UE.

**MP relay UE:** A UE that provides connectivity of indirect path to a MP remote UE. When the connectivity is PC5 unicast link, the MP relay UE is acting as a L2 U2N Relay UE. When the connectivity is Non-3GPP Connection, the MP relay UE is acting as a N3C relay UE.

**NCSG:** Network controlled small gap as defined in TS 38.133 [14].

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

**N3C indirect path:** In Multi-path, the indirect path using Non-3GPP Connection between remote UE and relay UE.

**NR sidelink communication**: AS functionality enabling at least V2X Communication as defined in TS 23.287 [55] and/or A2X Communication as defined in TS 23.256 [76] and/or ProSe Communication (including ProSe UE-to-Network Relay, non-Relay communication, and ProSe UE-to-UE Relay Communication including UE-to-UE Relay communication with integrated discovery) as defined in TS 23.304 [65] between two or more nearby UEs, using NR technology but not traversing any network node.

**NR sidelink discovery**: AS functionality enabling ProSe non-Relay Discovery, ProSe UE-to-Network Relay discovery and ProSe UE-to-UE Relay discovery for Proximity based Services as defined in TS 23.304 [65] between two or more nearby UEs, using NR technology but not traversing any network node.

**NR sidelink positioning:** AS functionality which determines geographical or relative location and possibly velocity of a target UE or ranging via PC5 interface using SL-PRS transmission and reception as defined in TS 38.305 [73] and TS 38.355 [77].

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

**Primary Cell**: The MCG cell, operating on the primary frequency, in which the UE either performs the initial connection establishment procedure or initiates the connection re-establishment procedure.

**Parent UE:** A U2N Remote UE’s or U2N Relay UE’s next hop U2N Relay UE in upstream direction for serving the U2N Remote UE in U2N Relay communication.

**PC5 Relay RLC channel**: An RLC channel between L2 U2N Remote UE and L2 U2N Relay UE, or between L2 U2N Relay UEs (in case of multi-hop L2 U2N relay communication),or between L2 U2U Remote UE and L2 U2U Relay UE, which is used to transport packets over PC5 for L2 UE-to-Network relay or L2 UE-to-UE relay.

**PDU Set**: one or more PDUs carrying the payload of one unit of information generated at the application level (e.g. frame(s) or video slice(s) for XR Services), as defined in TS 23.501 [32].

**Primary SCG Cell**: For dual connectivity operation, the SCG cell in which the UE performs random access when performing the Reconfiguration with Sync procedure.

**Primary Timing Advance Group**: Timing Advance Group containing the SpCell.

**PUCCH SCell:** An SCell configured with PUCCH by *PUCCH-Config*.

**PUSCH-Less SCell:** An SCell configured without PUSCH.

**Quasi-Earth-fixed cell**: An NTN cell fixed with respect to a certain geographic area on Earth during a certain time duration. It can be provisioned by beam(s) covering one geographic area for a limited period and a different geographic area during another period (e.g., the case of NGSO satellites generating steerable beams).

**RedCap UE:** A UE with reduced capabilities as specified in clause 4.2.21.1 in TS 38.306 [26].

**RLC bearer configuration:** The lower layer part of the radio bearer configuration comprising the RLC and logical channel configurations.

**Secondary Cell**: For a UE configured with CA, a cell providing additional radio resources on top of Special Cell.

**Secondary Cell Group**: For a UE configured with dual connectivity, the subset of serving cells comprising of the PSCell and zero or more secondary cells.

**Serving Cell**: For a UE in RRC\_CONNECTED not configured with CA/DC there is only one serving cell comprising of the primary cell. For a UE in RRC\_CONNECTED configured with CA/ DC the term 'serving cells' is used to denote the set of cells comprising of the Special Cell(s) and all secondary cells.

**Small Data Transmission**: A procedure used for transmission of data and/or signalling over allowed radio bearers in RRC\_INACTIVE state (i.e. without the UE transitioning to RRC\_CONNECTED state). The SDT procedure is considered to be ongoing once the conditions for initating SDT as specified in clause 5.3.13.1b are fulfilled until the SDT procedure is completed either successfully or unsuccessfully as specified in clause 18.0 in TS 38.300 [2].

**SNPN identity:** an identifier of an SNPN comprising of a PLMN ID and an NID combination.

**SL indirect path:** In Multi-path, the indirect path using PC5 unicast link between remote UE and relay UE.

**Special Cell:** For Dual Connectivity operation the term Special Cell refers to the PCell of the MCG or the PSCell of the SCG, otherwise the term Special Cell refers to the PCell.

**Split DRB:** In MR-DC, a DRB that supports transmission via MCG and SCG, as well as duplication of PDCP PDUs as defined in TS 37.340 [41]; or in MP, a DRB that supports transmission via direct path and indirect path, as well as duplication of PDCP PDUs.

**Split SRB**: In MR-DC, an SRB that supports transmission via MCG and SCG as well as duplication of RRC PDUs as defined in TS 37.340 [41]; or in MP, a SRB that supports transmission via direct path and indirect path, as well as duplication of PDCP PDUs.

**SSB Frequency**: Frequency referring to the position of resource element RE=#0 (subcarrier #0) of resource block RB#10 of the SS block.

**U2N Relay UE**: A UE that provides functionality to support connectivity to the network for U2N Remote UE(s). Up to three L2 U2N Relay UEs (i.e. one Last U2N Relay UE and up to two Intermediate U2N Relay UEs including one First U2N Relay UE) can be configured for serving a L2 U2N Remote UE in multi-hop L2 U2N Relay communication in this release.

**U2N Remote UE**: A UE that communicates with the network via one or more U2N Relay UEs on an indirect path.

**U2U Relay UE:** A UE that provides functionality to support connectivity between two U2U Remote UEs.

**U2U Remote UE:** A UE that communicates with other UEs via a U2U Relay UE.

**UE-to-Network Relay communication:** A mode of communication in which a UE communicates with the network through an indirect path involving only one U2N Relay UE for single-hop L2 U2N Relay communication or multiple L2 U2N Relay UEs for multi-hop L2 U2N Relay communication.

**UE-to-Network Relay discovery:** A mode of NR sidelink discovery in which a UE discovers other UEs for U2N Relay communication.

**Upstream**: Direction toward parent node in IAB-topology or gNB in U2N Relay communication.

**Uu Relay RLC channel**: An RLC channel between L2 U2N Relay UE and gNB, which is used to transport packets over Uu for L2 UE-to-Network relay or for indirect path in case of MP**.**

**UE Inactive AS Context**: UE Inactive AS Context is stored when the connection is suspended and restored when the connection is resumed. It includes information as defined in clause 5.3.8.3.

**V2X sidelink communication**: AS functionality enabling V2X Communication as defined in TS 23.285 [56], between nearby UEs, using E-UTRA technology but not traversing any network node.

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

5GC 5G Core Network

A2X Aircraft-to-Everything

ACK Acknowledgement

AM Acknowledged Mode

ARQ Automatic Repeat Request

AS Access Stratum

ASN.1 Abstract Syntax Notation One

ATG Air to Ground

BAP Backhaul Adaptation Protocol

BCD Binary Coded Decimal

BFD Beam Failure Detection

BH Backhaul

BLER Block Error Rate

BRID Broadcast Remote Identification

BSR Buffer Status Report

BWP Bandwidth Part

CA Carrier Aggregation

CAG Closed Access Group

CAG-ID Closed Access Group Identifier

CAPC Channel Access Priority Class

CBR Channel Busy Ratio

CCCH Common Control Channel

CFR Common Frequency Resources

CG Cell Group

CHO Conditional Handover

CLI Cross Link Interference

CMAS Commercial Mobile Alert Service

CP Control Plane

CPA Conditional PSCell Addition

CPAC Conditional PSCell Addition or Change

CPC Conditional PSCell Change

C-RNTI Cell RNTI

CSI Channel State Information

DAA Detect And Avoid

DAPS Dual Active Protocol Stack

DC Dual Connectivity

DCCH Dedicated Control Channel

DCI Downlink Control Information

DCP DCI with CRC scrambled by PS-RNTI

DFN Direct Frame Number

DL Downlink

DL-PRS Downlink Positioning Reference Signal

DL-SCH Downlink Shared Channel

DM-RS Demodulation Reference Signal

DRB (user) Data Radio Bearer

DRX Discontinuous Reception

DSR Delay Status Report

DTCH Dedicated Traffic Channel

DTX Discontinuous Transmission

ECEF Earth-Centered, Earth-Fixed

ECI Earth-Centered Inertial

EN-DC E-UTRA NR Dual Connectivity with E-UTRA connected to EPC

EPC Evolved Packet Core

EPS Evolved Packet System

ETWS Earthquake and Tsunami Warning System

E-UTRA Evolved Universal Terrestrial Radio Access

E-UTRA/5GC E-UTRA connected to 5GC

E-UTRA/EPC E-UTRA connected to EPC

E-UTRAN Evolved Universal Terrestrial Radio Access Network

FDD Frequency Division Duplex

FFS For Further Study

G-CS-RNTI Group Configured Scheduling RNTI

GERAN GSM/EDGE Radio Access Network

GIN Group ID for Network selection

GNSS Global Navigation Satellite System

G-RNTI Group RNTI

GSM Global System for Mobile Communications

GSO Geosynchronous Orbit

HARQ Hybrid Automatic Repeat Request

HRNN Human Readable Network Name

HSDN High Speed Dedicated Network

H-SFN Hyper SFN

HST High Speed Train

IAB Integrated Access and Backhaul

IAB-DU IAB-node DU

IAB-MT IAB Mobile Termination

IDC In-Device Coexistence

IE Information element

IMSI International Mobile Subscriber Identity

kB Kilobyte (1000 bytes)

L1 Layer 1

L2 Layer 2

L3 Layer 3

LBT Listen Before Talk

LEO Low Earth Orbit

LTM L1/L2 Triggered Mobility

MAC Medium Access Control

MBS Multicast/Broadcast Service

MBS FSAI MBS Frequency Selection Area Identity

MCCH MBS Control Channel

MCG Master Cell Group

MDT Minimization of Drive Tests

MIB Master Information Block

MO-SDT Mobile Originated SDT

MPE Maximum Permissible Exposure

MP Multi-path

MRB MBS Radio Bearer

MR-DC Multi-Radio Dual Connectivity

MTCH MBS Traffic Channel

MT-SDT Mobile Terminated SDT

MTSI Multimedia Telephony Service for IMS

MUSIM Multi-Universal Subscriber Identity Module

N3C Non-3GPP Connection

N/A Not Applicable

NCR Network-Controlled Repeater

NCR-Fwd NCR Forwarding

NCR-MT NCR Mobile Termination

NE-DC NR E-UTRA Dual Connectivity

NES Network Energy Savings

(NG)EN-DC E-UTRA NR Dual Connectivity (covering E-UTRA connected to EPC or 5GC)

NGEN-DC E-UTRA NR Dual Connectivity with E-UTRA connected to 5GC

NID Network Identifier

NPN Non-Public Network

NR-DC NR-NR Dual Connectivity

NR/5GC NR connected to 5GC

NSAG Network Slice AS Group

NTN Non-Terrestrial Network

PCell Primary Cell

PDCP Packet Data Convergence Protocol

PDU Protocol Data Unit

PEI Paging Early Indication

PEI-O Paging Early Indication-Occasion

PLMN Public Land Mobile Network

PNI-NPN Public Network Integrated Non-Public Network

posSIB Positioning SIB

PPW PRS Processing Window

PRS Positioning Reference Signal

PSCell Primary SCG Cell

PSI PDU Set Importance

PTM Point to Multipoint

PTP Point to Point

PWS Public Warning System

QoE Quality of Experience

QoS Quality of Service

RAN Radio Access Network

RAT Radio Access Technology

RLC Radio Link Control

RLM Radio Link Monitoring

RMTC RSSI Measurement Timing Configuration

RNA RAN-based Notification Area

RNTI Radio Network Temporary Identifier

ROHC Robust Header Compression

RPLMN Registered Public Land Mobile Network

RRC Radio Resource Control

RS Reference Signal

SBAS Satellite Based Augmentation System

SCell Secondary Cell

SCG Secondary Cell Group

SCS Subcarrier Spacing

SD-RSRP Sidelink Discovery RSRP

SDT Small Data Transmission

SFN Single Frequency Network

SFN System Frame Number

SFTD SFN and Frame Timing Difference

SI System Information

SIB System Information Block

SL Sidelink

SL-PRS Sidelink Positioning Reference Signal

SLSS Sidelink Synchronisation Signal

SNPN Stand-alone Non-Public Network

SpCell Special Cell

SRAP Sidelink Relay Adaptation Protocol

SRB Signalling Radio Bearer

SRS Sounding Reference Signal

SSB Synchronization Signal Block

TAG Timing Advance Group

TDCP Time Domain Channel Property

TDD Time Division Duplex

TEG Timing Error Group

TM Transparent Mode

TMGI Temporary Mobile Group Identity

TN Terrestrial Network

TSS Timing Synchronization Status.

U2N UE-to-Network

U2U UE-to-UE

UDC Uplink Data Compression

UE User Equipment

UL Uplink

UM Unacknowledged Mode

UP User Plane

VR Virtual Reality

VSAT Very Small Aperture Terminal

XR eXtended Reality

In the ASN.1, lower case may be used for some (parts) of the above abbreviations e.g. c-RNTI.

# 4 General

## 4.1 Introduction

This specification is organised as follows:

- clause 4.2 describes the RRC protocol model;

- clause 4.3 specifies the services provided to upper layers as well as the services expected from lower layers;

- clause 4.4 lists the RRC functions;

- clause 5 specifies RRC procedures, including UE state transitions;

- clause 6 specifies the RRC messages in ASN.1 and description;

- clause 7 specifies the variables (including protocol timers and constants) and counters to be used by the UE;

- clause 8 specifies the encoding of the RRC messages;

- clause 9 specifies the specified and default radio configurations;

- clause 10 specifies generic error handling;

- clause 11 specifies the RRC messages transferred across network nodes;

- clause 12 specifies the UE capability related constraints and performance requirements.

## 4.2 Architecture

### 4.2.1 UE states and state transitions including inter RAT

A UE is either in RRC\_CONNECTED state or in RRC\_INACTIVE state when an RRC connection has been established. If this is not the case, i.e. no RRC connection is established, the UE is in RRC\_IDLE state. The RRC states can further be characterised as follows:

**- RRC\_IDLE**:

- A UE specific DRX may be configured by upper layers;

- At lower layers, the UE may be configured with a DRX for PTM transmission of MBS broadcast;

- UE controlled mobility based on network configuration;

- The UE:

- Monitors Short Messages transmitted with P-RNTI over DCI (see clause 6.5);

- Monitors a Paging channel for CN paging using 5G-S-TMSI, except if the UE is acting as a L2 U2N Remote UE;

- If configured by upper layers for MBS multicast reception, monitors a Paging channel for CN paging using TMGI;

- Performs neighbouring cell measurements and cell (re-)selection;

- Performs measurements on L2 U2N Relay UEs and relay (re-)selection;

- Acquires system information and can send SI request (if configured);

- Performs logging of available measurements together with location and time for logged measurement configured UEs;

- Performs idle/inactive measurements for idle/inactive measurement configured UEs;

- If configured by upper layers for MBS broadcast reception, acquires MCCH change notification and MBS broadcast control information and data.

**- RRC\_INACTIVE**:

- A UE specific DRX may be configured by upper layers or by RRC layer;

- At lower layers, the UE may be configured with a DRX for PTM transmission of MBS broadcast and/or a DRX for PTM transmission of MBS multicast;

- UE controlled mobility based on network configuration;

- The UE stores the UE Inactive AS context;

- A RAN-based notification area is configured by RRC layer;

- Transfer of unicast data and/or signalling to/from UE over radio bearers configured for SDT.

- The UE:

- Monitors Short Messages transmitted with P-RNTI over DCI (see clause 6.5);

- While T319a is running, monitors control channels associated with the shared data channel to determine if data is scheduled for it;

- While SDT procedure is ongoing and T319a is not running, if CG-SDT is selected and if extended CG-SDT periodicity is configured (i.e. *cg-SDT-PeriodicityExt* is configured), monitors a Paging channel for CN paging using 5G-S-TMSI and RAN paging using fullI-RNTI except if the UE is acting as a L2 U2N Remote UE;

- While SDT procedure is not ongoing, monitors a Paging channel for CN paging using 5G-S-TMSI and RAN paging using fullI-RNTI, except if the UE is acting as a L2 U2N Remote UE;

- If configured by upper layers for MBS multicast reception, while SDT procedure is not ongoing, monitors a Paging channel for paging using TMGI;

- Performs neighbouring cell measurements and cell (re-)selection;

- Performs measurements on L2 U2N Relay UEs and relay (re-)selection;

- Performs RAN-based notification area updates periodically and when moving outside the configured RAN-based notification area;

- Acquires system information and, while SDT procedure is not ongoing, can send SI request (if configured);

- While SDT procedure is not ongoing, performs logging of available measurements together with location and time for logged measurement configured UEs;

- While SDT procedure is not ongoing, performs idle/inactive measurements for idle/inactive measurement configured UEs;

- If configured by upper layers for MBS broadcast reception, acquires MCCH change notification and MBS broadcast control information and data;

- If configured for MBS multicast reception in RRC\_INACTIVE, acquires multicast MCCH change notification and MBS multicast control information and data;

- Transmits SRS for Positioning.

**- RRC\_CONNECTED:**

- The UE stores the AS context;

- Transfer of unicast data to/from UE;

- Transfer of MBS multicast data to UE;

- At lower layers, the UE may be configured with a UE specific DRX;

- At lower layers, the UE may be configured with a DRX for PTM transmission of MBS broadcast and/or a DRX for MBS multicast;

- At lower layers, the UE may be configured with a cell specific cell DTX/DRX;

- For UEs supporting CA, use of one or more SCells, aggregated with the SpCell, for increased bandwidth;

- For UEs supporting DC, use of one SCG, aggregated with the MCG, for increased bandwidth;

- Network controlled mobility within NR, to/from E-UTRA, and to UTRA-FDD;

- Network controlled mobility (path switch) between a serving cell and a L2 U2N Relay UE for single hop, or vice versa, or between a serving cell and L2 U2N Relay UEs for multi hop, or vice versa, or between a source L2 U2N Relay UE and a target L2 U2N Relay UE for single hop, or between a single hop source L2 U2N Relay UE and target L2 U2N Relay UEs for multi hop, or vice versa [RIL]: H455, SLRelay;

- Network controlled MP operation.

- The UE:

- Monitors Short Messages transmitted with P-RNTI over DCI (see clause 6.5), if configured;

- Monitors control channels associated with the shared data channel to determine if data is scheduled for it;

- Provides channel quality and feedback information;

- Performs neighbouring cell and/or L2 U2N relay measurements and measurement reporting;

- Acquires system information;

- Performs immediate MDT measurement together with available location reporting;

- If configured by upper layers for MBS broadcast reception, acquires MCCH change notification and MBS broadcast control information and data.

Figure 4.2.1-1 illustrates an overview of UE RRC state machine and state transitions in NR. A UE has only one RRC state in NR at one time.



Figure 4.2.1-1: UE state machine and state transitions in NR

Figure 4.2.1-2 illustrates an overview of UE state machine and state transitions in NR as well as the mobility procedures supported between NR/5GC, E-UTRA/EPC and E-UTRA/5GC.



Figure 4.2.1-2: UE state machine and state transitions between NR/5GC, E-UTRA/EPC and E-UTRA/5GC

Figure 4.2.1-3 illustrates the mobility procedure supported between NR/5GC and UTRA-FDD.



Figure 4.2.1-3: Mobility procedure supported between NR/5GC and UTRA-FDD

### 4.2.2 Signalling radio bearers

"Signalling Radio Bearers" (SRBs) are defined as Radio Bearers (RBs) that are used only for the transmission of RRC and NAS messages. More specifically, the following SRBs are defined:

- SRB0 is for RRC messages using the CCCH logical channel (except SRB0 of L2 U2N Remote UE; or except SRB0 of L2 Intermediate U2N Relay UE in case of multi hop);

- SRB1 is for RRC messages (which may include a piggybacked NAS message) as well as for NAS messages prior to the establishment of SRB2, all using DCCH logical channel (except SRB1 of L2 U2N Remote UE; or except SRB1 of L2 Intermediate U2N Relay UE in case of multi hop);

- SRB2 is for NAS messages and for RRC messages which include logged measurement information, all using DCCH logical channel (except SRB2 of L2 U2N Remote UE; or except SRB2 of L2 Intermediate U2N Relay UE in case of multi hop). SRB2 has a lower priority than SRB1 and may be configured by the network after AS security activation;

- SRB3 is for specific RRC messages when UE is in (NG)EN-DC or NR-DC, all using DCCH logical channel;

- SRB4 is for RRC messages which include application layer measurement report information, all using DCCH logical channel. SRB4 has a lower priority than SRB1 and can only be configured by the network after AS security activation.

- SRB5 is for RRC messages which include application layer measurement report information, all using DCCH logical channel. SRB5 has a lower priority than SRB1 and SRB3 and can only be configured by the SN serving the SCG when the UE is in NR-DC, after AS security activation.

In downlink, piggybacking of NAS messages is used only for one dependant (i.e. with joint success/failure) procedure: bearer establishment/modification/release. In uplink piggybacking of NAS message is used only for transferring the initial NAS message during connection setup and connection resume.

NOTE 1: The NAS messages transferred via SRB2 are also contained in RRC messages, which however do not include any RRC protocol control information.

Once AS security is activated, all RRC messages on SRB1, SRB2, SRB3, SRB4 and SRB5, including those containing NAS messages, are integrity protected and ciphered by PDCP. NAS independently applies integrity protection and ciphering to the NAS messages, see TS 24.501 [23].

Split SRB is supported for all the MR-DC options as well as MP in both SRB1 and SRB2 (split SRB is not supported for SRB0, SRB3, SRB4 and SRB5).

For operation with shared spectrum channel access in FR1, SRB0, SRB1 and SRB3 are assigned with the highest priority Channel Access Priority Class (CAPC), (i.e. CAPC = 1) while CAPC for SRB2 is configurable.

For the NR sidelink L2 U2N relay operations not involved in MP or for the NR sidelink L2 multi hop U2N relay operations, SRB0, SRB1, SRB2 of a L2 U2N Remote UE or of a L2 Intermediate U2N Relay UE are not using Uu CCCH/DCCH logical channels. The SRB0, SRB1, SRB2 of a L2 U2N Remote UE or of a L2 Intermediate U2N Relay UE are transmitted via the PC5 Relay RLC channels over PC5 and Uu Relay RLC channels over Uu.

## 4.3 Services

### 4.3.1 Services provided to upper layers

The RRC protocol offers the following services to upper layers:

- Broadcast of common control information;

- Notification of UEs in RRC\_IDLE, e.g. about a mobile terminating call;

- Notification of UEs about ETWS and/or CMAS;

- Transfer of dedicated signalling;

- Broadcast of positioning assistance data;

- Transfer of application layer measurement configuration and reporting.

### 4.3.2 Services expected from lower layers

In brief, the following are the main services that RRC expects from lower layers:

- Integrity protection, ciphering and loss-less in-sequence delivery of information without duplication;

## 4.4 Functions

The RRC protocol includes the following main functions:

- Broadcast of system information:

- Including NAS common information;

- Information applicable for UEs in RRC\_IDLE and RRC\_INACTIVE (e.g. cell (re-)selection parameters, neighbouring cell information) and information (also) applicable for UEs in RRC\_CONNECTED (e.g. common channel configuration information);

- Including ETWS notification, CMAS notification;

- Including positioning assistance data.

- RRC connection control:

- Paging;

- Establishment/modification/suspension/resumption/release of RRC connection, including e.g. assignment/modification of UE identity (C-RNTI, fullI-RNTI, etc.), establishment/modification/suspension/resumption/release of SRBs (except for SRB0);

- Access barring;

- Initial AS security activation, i.e. initial configuration of AS integrity protection (SRBs, DRBs) and AS ciphering (SRBs, DRBs);

- RRC connection mobility including e.g. intra-frequency and inter-frequency handover, path switch from a PCell to a target L2 U2N Relay UE or from a L2 U2N Relay UE to a target PCell or from a source L2 U2N Relay UE to a target L2 U2N Relay UE in case of single hop or path switch from a PCell to target path via multiple L2 U2N Relay UEs or from source path via multiple L2 U2N Relay UEs to a target PCell or from a source L2 U2N Relay UE to target path via multiple L2 U2N Relay UEs or from source path via multiple L2 U2N Relay UEs to a target L2 U2N Relay UE in case of multi hop, associated AS security handling, i.e. key/algorithm change, specification of RRC context information transferred between network nodes;- Establishment/modification/suspension/resumption/release of RBs carrying user data (DRBs/MRBs);

- Radio configuration control including e.g. assignment/modification of ARQ configuration, HARQ configuration, DRX configuration;

- In case of DC, cell management including e.g. change of PSCell, addition/modification/release of SCG cell(s);

- In case of CA, cell management including e.g. addition/modification/release of SCell(s);

- In case of MP, path management including e.g. addition/modification/release of indirect path;

- QoS control including assignment/ modification of semi-persistent scheduling (SPS) configuration and configured grant configuration for DL and UL respectively, assignment/ modification of parameters for UL rate control in the UE, i.e. allocation of a priority and a prioritised bit rate (PBR) for each RB of UE and logical channel of IAB-MT.

- Recovery from radio link failure.

- Inter-RAT mobility including e.g. AS security activation, transfer of RRC context information;

- Measurement configuration and reporting:

- Establishment/modification/release of measurement configuration (e.g. intra-frequency, inter-frequency and inter- RAT measurements);

- Setup and release of measurement gaps;

- Measurement reporting.

- Configuration of BAP entity and BH RLC channels for the support of IAB-node.

- Configuration of SRAP entity and Uu/PC5 Relay RLC channels for the support of L2 U2N relay.

- Configuration of SRAP entity and PC5 Relay RLC channels for the support of L2 U2U relay operation.

- Other functions including e.g. generic protocol error handling, transfer of dedicated NAS information, transfer of UE radio access capability information.

- Support of self-configuration and self-optimisation.

- Support of measurement logging and reporting for network performance optimisation, as specified in TS 37.320 [61];

- Support of transfer of application layer measurement configuration and reporting.

- Configuration of side control information for NCR-node.

# 5 Procedures

## 5.1 General

### 5.1.1 Introduction

This clause covers the general requirements.

### 5.1.2 General requirements

The UE shall:

1> process the received messages in order of reception by RRC, i.e. the processing of a message shall be completed before starting the processing of a subsequent message;

NOTE: Network may initiate a subsequent procedure prior to receiving the UE's response of a previously initiated procedure.

1> within a clause execute the steps according to the order specified in the procedural description;

1> consider the term 'radio bearer' (RB) to cover SRBs, DRBs and MRBs unless explicitly stated otherwise;

1> set the *rrc-TransactionIdentifier* in the response message, if included, to the same value as included in the message received from the network that triggered the response message;

1> upon receiving a choice value set to *setup*:

2> apply the corresponding received configuration and start using the associated resources, unless explicitly specified otherwise;

1> upon receiving a choice value set to *release*:

2> clear the corresponding configuration and stop using the associated resources;

1> in case the size of a list is extended, upon receiving an extension field comprising the entries in addition to the ones carried by the original field (regardless of whether the network signals more entries in total); apply the following generic behaviour unless explicitly stated otherwise:

2> create a combined list by concatenating the additional entries included in the extension field to the original field while maintaining the order among both the original and the additional entries;

2> for the combined list, created according to the previous, apply the same behaviour as defined for the original field.

### 5.1.3 Requirements for UE in MR-DC

In this specification, the UE considers itself to be in:

- EN-DC, if and only if it is configured with *nr-SecondaryCellGroupConfig* according to TS 36.331[10], and it is connected to EPC,

- NGEN-DC, if and only if it is configured with *nr-SecondaryCellGroupConfig* according to TS 36.331[10], and it is connected to 5GC,

- NE-DC, if and only if it is configured with *mrdc-SecondaryCellGroup* set to *eutra-SCG*,

- NR-DC, if and only if it is configured with *mrdc-SecondaryCellGroup* set to *nr-SCG*,

- MR-DC, if and only if it is in (NG)EN-DC, NE-DC or NR-DC.

NOTE: This use of these terms deviates from the definition in TS 37.340 [41] and other specifications. In TS 37.340, these terms include also the case where the UE is configured with E-UTRA or NR MCG only (i.e. no NR or E-UTRA SCG) but with one or more bearers terminated in a secondary node (i.e. using NR PDCP).

The UE in (NG)EN-DC only executes a subclause of clause 5 in this specification when the subclause:

- is referred to from a subclause under execution, either in this specification or in TS 36.331 [10]; or

- applies to a message received on SRB3 (if SRB3 is established); or

- applies to field(s), IE(s), UE variable(s) or timer(s) in this specification that the UE is configured with.

When executing a subclause of clause 5 in this specification, the UE follows the requirements in clause 5.1.2 and in all subclauses of this specification applicable to the messages (including processing time requirements), fields, IEs, timers and UE variables indicated in the subclause under execution.

## 5.2 System information

### 5.2.1 Introduction

System Information (SI) is divided into the *MIB* and a number of SIBs and posSIBs where:

- the *MIB* is always transmitted on the BCH with a periodicity of 80 ms and repetitions made within 80 ms (TS 38.212 [17], clause 7.1) and it includes parameters that are needed to acquire *SIB1* from the cell. The first transmission of the *MIB* is scheduled in subframes as defined in TS 38.213 [13], clause 4.1 and repetitions are scheduled according to the period of SSB;

NOTE 1: If the period of SSB is larger than 80 ms, the MIB is transmitted with the same periodicity as that of SSB.

- the *SIB1* is transmitted on the DL-SCH with a periodicity of 160 ms and variable transmission repetition periodicity within 160 ms as specified in TS 38.213 [13], clause 13. The default transmission repetition periodicity of *SIB1* is 20 ms but the actual transmission repetition periodicity is up to network implementation. For SSB and CORESET multiplexing pattern 1, *SIB1* repetition transmission period is 20 ms. For SSB and CORESET multiplexing pattern 2/3, *SIB1* transmission repetition period is the same as the SSB period (TS 38.213 [13], clause 13). *SIB1* includes information regarding the availability and scheduling (e.g. mapping of SIBs to SI message, periodicity, SI-window size) of other SIBs with an indication whether one or more SIBs are only provided on-demand and, in that case, the configuration needed by the UE to perform the SI request. *SIB1* is cell-specific SIB;

- SIBs other than *SIB1* and posSIBs are carried in *SystemInformation* (SI) messages, which are transmitted on the DL-SCH. Only SIBs or posSIBs having the same periodicity can be mapped to the same SI message. SIBs and posSIBs are mapped to different SI messages, i.e. an SI message contains either only SIBs or only posSIBs. Each SI message is transmitted within periodically occurring time domain windows (referred to as SI-windows with same length for all SI messages). Each SI message is associated with an SI-window and the SI-windows of different SI messages do not overlap. That is, within one SI-window only the corresponding SI message is transmitted. An SI message may be repeated with the same content a number of times within the SI-window. Any SIB or posSIB except *SIB1* can be configured to be cell specific or area specific, using an indication in *SIB1*. The cell specific SIB is applicable only within a cell that provides the SIB while the area specific SIB is applicable within an area referred to as SI area, which consists of one or several cells and is identified by s*ystemInformationAreaID*;

- The mapping of SIBs to SI messages is configured in *schedulingInfoList* and *schedulingInfoList2*, while the mapping of posSIBs to SI messages is configured in *posSchedulingInfoList* and *schedulingInfoList2.*Each SIB and each posSIB is mapped to a single SI message. posSIBs of the same *posSibType* carrying GNSS Generic Assistance Data for different GNSS/SBAS (identified by *gnss-id/sbas-id*, see TS 37.355 [49]) are mapped to different SI messages.  
Each SIB and posSIB is contained at most once in an SI message.  
For SIBs and posSIBs with segments, the segments contained in SI messages are transmitted according to the SI message periodicity, with one segment of a particular *sibType*/*posSibType* in each SI message;

- For a UE in RRC\_CONNECTED, the network can provide system information through dedicated signalling using the *RRCReconfiguration* message, e.g. if the UE has an active BWP with no common search space configured to monitor system information, paging, or upon request from the UE.

- For PSCell and SCells, the network provides the required SI by dedicated signalling, i.e. within an *RRCReconfiguration* message. Nevertheless, the UE shall acquire *MIB* of the PSCell to get SFN timing of the SCG (which may be different from MCG). Upon change of relevant SI for SCell, the network releases and adds the concerned SCell. For PSCell, the required SI can only be changed with Reconfiguration with Sync.

NOTE 2: The physical layer imposes a limit to the maximum size a SIB can take. The maximum *SIB1* or *SI message* size is 2976 bits.

### 5.2.2 System information acquisition

#### 5.2.2.1 General UE requirements



Figure 5.2.2.1-1: System information acquisition

The UE applies the SI acquisition procedure to acquire the AS, NAS- and positioning assistance data information. The procedure applies to UEs in RRC\_IDLE, in RRC\_INACTIVE and in RRC\_CONNECTED.

The UE in RRC\_IDLE and RRC\_INACTIVE shall ensure having a valid version of (at least) the *MIB*, *SIB1* through *SIB4,* *SIB5* (if the UE supports E-UTRA), *SIB11* (if the UE is configured for idle/inactive measurements), *SIB12* (if UE is capable of NR sidelink communication/discovery and is configured by upper layers to receive or transmit NR sidelink communication/discovery), and *SIB13*, *SIB14* (if UE is capable of V2X sidelink communication and is configured by upper layers to receive or transmit V2X sidelink communication), *SIB15* (if UE is configured by upper layers to report disaster roaming related information), *SIB16* (if the UE is capable of slice-based cell reselection and the UE receives NSAG information for cell reselection from upper layer), *SIB17* or *SIB17bis* (if the UE is using TRS resources for power saving in RRC\_IDLE and RRC\_INACTIVE), *SIB19* (if UE is accessing NR via NTN access), *SIB22* (for ATG access), and *SIB23* (if UE is capable of NR sidelink positioning and is configured by upper layers to receive or transmit SL-PRS).

The UE capable of MBS broadcast which is receiving or interested to receive MBS broadcast service(s) via a broadcast MRB shall ensure having a valid version of *SIB20*, regardless of the RRC state the UE is in.

The UE shall ensure having a valid version of the posSIB requested by upper layers.

#### 5.2.2.2 SIB validity and need to (re)-acquire SIB

##### 5.2.2.2.1 SIB validity

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

When the UE acquires a *MIB* or a *SIB1* or an SI message in a serving cell as described in clause 5.2.2.3, and if the UE stores the acquired SIB, then the UE shall store the associated *areaScope*, if present, the first *PLMN-Identity* in the *PLMN-IdentityInfoList* for non-NPN-only cells or the first NPN identity (SNPN identity in case of SNPN, or PNI-NPN identity in case of PNI-NPN) in the *NPN-IdentityInfoList* for NPN-only cells, the *cellIdentity*, the *systemInformationAreaID*, if present, and the *valueTag*, if present, as indicated in the *si-SchedulingInfo* for the SIB. If the UE stores the acquired posSIB, then the UE shall store the associated *areaScope*, if present, the *cellIdentity*, the *systemInformationAreaID*, if present, the *valueTag*, if provided in *assistanceDataSIB-Element*, and the *expirationTime* if provided in *assistanceDataSIB-Element*. The UE may use a valid stored version of the SI except *MIB*, *SIB1*, *SIB6*, *SIB7* or *SIB8* e.g. after cell re-selection, upon return from out of coverage or after the reception of SI change indication. The *valueTag* and *expirationTime* for posSIB is optionally provided in *assistanceDataSIB-Element*, as specified in TS 37.355 [49].

A L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE can inform the interested SIB(s) to the connected parent L2 U2N Relay UE as defined in clause 5.8.9.8.2 and receive the SIB(s) from the parent L2 U2N Relay UE as defined in clause 5.8.9.9.3. A L2 U2N Remote UE in RRC\_CONNECTED receives SIB1 and other SIB(s) in *RRCReconfiguration* message and performs on-demand SI request if required, as defined in clause 5.2.2.3.5 and 5.2.2.3.6. The L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE or RRC\_CONNECTED (when MP is not configured) is not required to obtain SI over Uu interface, but it may decide to perform the SI acquisition procedure over Uu interface as defined in clause 5.2.2.3 by UE implementation.

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

The UE shall:

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

1> for each stored version of a SIB:

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

3> if the UE is NPN capable and the cell is an NPN-only cell:

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

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

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

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

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

3> if the UE is NPN capable and the cell is an NPN-only cell:

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

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

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

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

1> for each stored version of a posSIB:

2> if the *areaScope* is associated and its value for the stored version of the posSIB is the same as the value received in the *posSIB-MappingInfo* for that posSIB from the serving cell and the *systemInformationAreaID* included in the *si-SchedulingInfo* is identical to the *systemInformationAreaID* associated with the stored version of that posSIB:

3> if the *valueTag* (see TS 37.355 [49]) for the posSIB received from the serving cell is identical to the *valueTag* associated with the stored version of that posSIB; or if the *expirationTime* (see TS 37.355 [49]) associated with the stored posSIB has not been expired:

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

2> if the *areaScope* is not present for the stored version of the posSIB and the *areaScope* value is not included in the *posSIB-MappingInfo* for that posSIB from the serving cell and the *cellIdentity* for the posSIB received from the serving cell is identical to the *cellIdentity* associated with the stored version of that posSIB:

3> if the *valueTag* (see TS 37.355 [49]) for the posSIB received from the serving cell is identical to the *valueTag* associated with the stored version of that posSIB; or if the *expirationTime* (see TS 37.355 [49]) associated with the stored posSIB has not been expired:

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

##### 5.2.2.2.2 SI change indication and PWS notification

A modification period is used, i.e. updated SI message (other than SI message for ETWS, CMAS, positioning assistance data, and some NTN-specific information as specified in the field descriptions) is broadcasted in the modification period following the one where SI change indication is transmitted. The modification period boundaries are defined by SFN values for which SFN mod m = 0, where m is the number of radio frames comprising the modification period. The modification period is configured by system information. If H-SFN is provided in *SIB1*, and UE is configured with eDRX,modification period boundaries are defined by SFN values for which (H-SFN \* 1024 + SFN) mod *m* = 0.

For UEs in RRC\_IDLE or RRC\_INACTIVE configured to use an IDLE eDRX cycle longer than the modification period, an eDRX acquisition period is defined. The boundaries of the eDRX acquisition period are determined by H-SFN values for which H-SFN mod 1024 = 0.

The UE receives indications about SI modifications and/or PWS notifications using Short Message transmitted with P-RNTI over DCI (see clause 6.5). Repetitions of SI change indication may occur within preceding modification period or within preceding eDRX acquisition period. SI change indication is not applicable for SI messages containing posSIBs.

UEs in RRC\_IDLE or in RRC\_INACTIVE while SDT procedure is not ongoing shall monitor for SI change indication in its own paging occasion(s) that the UE monitors as specified in TS 38.304 [20]. UEs in RRC\_CONNECTED shall monitor for SI change indication in any paging occasion at least once per modification period if the UE is provided with common search space, including *pagingSearchSpace*, *searchSpaceSIB1* and *searchSpaceOtherSystemInformation*, on the active BWP to monitor paging, as specified in TS 38.213 [13], clause 13.

For UEs in RRC\_INACTIVE while SDT procedure is ongoing:

- if T319a is not running and if CG-SDT is selected and if extended CG-SDT periodicity is configured (i.e. *cg-SDT-PeriodicityExt* is configured), the UE shall monitor for SI change indication in its own paging occasion(s) that the UE monitors as specified in TS 38.304 [20];

- in other cases, the UE shall monitor for SI change indication in any paging occasion at least once per modification period, if the initial downlink BWP on which the SDT procedure is ongoing is associated with a CD-SSB.

During a modification period where ETWS or CMAS transmission is started or stopped, the SI messages carrying the posSIBs scheduled in *posSchedulingInfoList* may change, so the UE might not be able to successfully receive those posSIBs in the remainder of the current modification period and next modification period according to the scheduling information received prior to the change.

ETWS or CMAS capable UEs in RRC\_IDLE or in RRC\_INACTIVE while SDT procedure is not ongoing shall monitor for indications about PWS notification in its own paging occasion(s) that the UE monitors as specified in TS 38.304 [20]. ETWS or CMAS capable UEs in RRC\_CONNECTED shall monitor for indication about PWS notification in any paging occasion at least once every *defaultPagingCycle* if the UE is provided with common search space, including *pagingSearchSpace*, *searchSpaceSIB1* and *searchSpaceOtherSystemInformation,* on the active BWP to monitor paging.

For ETWS or CMAS capable UEs in RRC\_INACTIVE while SDT procedure is ongoing: :

- if T319a is not running and if CG-SDT is selected and if extended CG-SDT periodicity is configured (i.e. *cg-SDT-PeriodicityExt* is configured), the UE shall monitor for indications about PWS notification in its own paging occasion(s) that the UE monitors as specified in TS 38.304 [20];

- in other cases, the UE shall monitor for indication about PWS notification in any paging occasion at least once every *defaultPagingCycle*, if the initial downlink BWP on which the SDT procedure is ongoing is associated with a CD-SSB*.*

For Short Message reception in a paging occasion, the UE monitors the PDCCH monitoring occasion(s) for paging as specified in TS 38.304 [20] and TS 38.213 [13].

A L2 U2N Remote UE is not required to monitor paging occasion for SI modifications and/or PWS notifications. It obtains the updated system information and SIB6/7/8 from the connected L2 U2N Relay UE as defined in clause 5.8.9.9.3.

If the UE receives a Short Message, the UE shall:

1> if the UE is ETWS capable or CMAS capable, the *etwsAndCmasIndication* bit of Short Message is set, and the UE is provided with *searchSpaceSIB1* and *searchSpaceOtherSystemInformation* on the active BWP or the initial BWP:

2> immediately re-acquire the *SIB1*;

2> if the UE is ETWS capable and *si-SchedulingInfo* includes scheduling information for *SIB6*:

3> acquire *SIB6*, as specified in clause 5.2.2.3.2,immediately;

2> if the UE is ETWS capable and *si-SchedulingInfo* includes scheduling information for *SIB7*:

3> acquire *SIB7*, as specified in clause 5.2.2.3.2,immediately;

2> if the UE is CMAS capable and *si-SchedulingInfo* includes scheduling information for *SIB8*:

3> acquire *SIB8*, as specified in clause 5.2.2.3.2,immediately;

NOTE: In case *SIB1*, *SIB6*, *SIB7*, or *SIB8* overlap with a measurement gap it is left to UE implementation how to immediately acquire *SIB1*, *SIB6*, *SIB7*, or *SIB8*.

1> if the UE does not operate an IDLE eDRX cycle longer than the modification period and the *systemInfoModification* bit of Short Message is set:

2> apply the SI acquisition procedure as defined in clause 5.2.2.3 from the start of the next modification period;

1> if the UE operates an IDLE eDRX cycle longer than the modification period and the *systemInfoModification-eDRX* bit of Short Message is set:

2> apply the SI acquisition procedure as defined in clause 5.2.2.3 from the start of the next eDRX acquisition period boundary.

=================================NEXT CHANGE=======================================

##### 5.2.2.4.2 Actions upon reception of the *SIB1*

Upon receiving the *SIB1* the UE shall:

1> store the acquired *SIB1*;

1> if the access is for NTN:

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

3> if the *cellBarredNTN* in the acquired *SIB1* is set to *barred* or the *cellBarredNTN* is not included in the acquired *SIB1*:

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

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

3> if the UE is a fixed VSAT UE and the *cellBarredFixedVSAT* in the acquired *SIB1* is set to *barred* or the *cellBarredFixedVSAT* is not included in the acquired *SIB1*, or

3> if the UE is a mobile VSAT UE and the *cellBarredMobileVSAT* in the acquired *SIB1* is set to *barred* or the *cellBarredMobileVSAT* is not included in the acquired *SIB1*:

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

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

1> if the access is for ATG:

2> if the UE is in RRC\_IDLE or in RRC\_INACTIVE, or if the UE is in RRC\_CONNECTED while *T311* is running; and

2> if the *cellBarredATG* in the acquired *SIB1* is set to *barred* or the *cellBarredATG* is not included in the acquired *SIB1*:

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

3> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

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

2> if *intraFreqReselectionRedCap* is not present in *SIB1*; or

2> if the *halfDuplexRedCapAllowed* is not present in the acquired *SIB1* and the UE supports only half-duplex FDD operation:

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

3> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

2> else:

3> if the *cellBarredRedCap1Rx* is present in the acquired *SIB1* and is set to *barred* and the UE supports 1 Rx branch; or

3> if the *cellBarredRedCap2Rx* is present in the acquired *SIB1* and is set to *barred* and the UE supports 2 Rx branches:

4> evaluate the cell barring criteria in accordance with TS 38.304 [20];

4> if the cell is considered as barred;

5> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

1> if the UE is a 2Rx XR UE and is in RRC\_IDLE or in RRC\_INACTIVE, or if the 2Rx XR UE is in RRC\_CONNECTED while *T311* is running:

2> if the *cellBarred2RxXR* is present in the acquired *SIB1*:

3> evaluate the cell barring criteria in accordance with TS 38.304 [20];

3> if the cell is considered as barred;

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20] upon which the procedure ends;

1> if the UE supports *nes-CellDTX-DRX* and it is in RRC\_IDLE or in RRC\_INACTIVE, or if the UE supporting *nes-CellDTX-DRX* is in RRC\_CONNECTED while *T311* is running:

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

3> if *cellBarredNES* is absent in the acquired *SIB1:*

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

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

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

2> if *intraFreqReselection-eRedCap* is not present in *SIB1*; or

2> if the *halfDuplexRedCapAllowed* is not present in the acquired *SIB1* and the UE supports only half-duplex FDD operation:

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

3> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

2> else:

3> if the *cellBarred-eRedCap1Rx* is present in the acquired *SIB1* and is set to *barred* and the UE supports 1 Rx branch; or

3> if the *cellBarred-eRedCap2Rx* is present in the acquired *SIB1* and is set to *barred* and the UE supports 2 Rx branches:

4> evaluate the cell barring criteria in accordance with TS 38.304 [20];

4> if the cell is considered as barred;

5> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20] upon which the procedure ends;

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

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

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

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

1> if the UE in RRC\_INACTIVE is configured for feature(s) that it does not support in current serving cell:

2> not use the corresponding configuration in current serving cell;

NOTE 0: The requirement above applies only to UE that indicates different support of UE capabilities for TN and NTN.

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

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

2> forward the *cellIdentity* to upper layers;

2> forward the *trackingAreaCode* to upper layers, if included;

2> forward the *trackingAreaList* to upper layers, if included;

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

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

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

3> use the stored version of the required SIB or posSIB;

2> else:

3> acquire the required SIB or posSIB requested by upper layer as defined in clause 5.2.2.3.5;

NOTE 1: Void.

1> else:

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

2> if the UE is IAB-MT or wide area NCR-MT (see TS 38.106 [79]) or supports at least one *additionalSpectrumEmission* in the *nr-NS-PmaxList* or *nr-NS-PmaxListAerial* for a supported band in the downlink for TDD, or a supported band in uplink for FDD, and

2> if the UE supports an uplink channel bandwidth with a maximum transmission bandwidth configuration (see TS 38.101-1 [15], TS 38.101-2 [39], and TS 38.101-5 [75]) which

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

- is wider than or equal to the bandwidth of the initial uplink BWP or, for (e)RedCap UE, of the RedCap-specific initial uplink BWP if configured, and

2> if the UE supports a downlink channel bandwidth with a maximum transmission bandwidth configuration (see TS 38.101-1 [15], TS 38.101-2 [39], and TS 38.101-5 [75]) which

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

- is wider than or equal to the bandwidth of the initial downlink BWP or, for (e)RedCap UE, of the RedCap-specific initial downlink BWP if configured, and

2> if *frequencyShift7p5khz* is present and the UE supports corresponding 7.5kHz frequency shift on this band; or *frequencyShift7p5khz* is not present, and

2> if the UE is neither a RedCap nor an eRedCap UE, or for TDD if the UE is an (e)RedCap UE, or for FDD if the UE is an (e)RedCap UE and *halfDuplexRedCapAllowed* is present, or if the UE is an (e)RedCap UE and the (e)RedCap UE supports full-duplex FDD operation on this band:

3> if neither *trackingAreaCode* nor *trackingAreaList* is provided for the selected PLMN nor the registered PLMN nor PLMN of the equivalent PLMN list:

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

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

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

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

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

3> else if UE is NCR-MT and if *ncr-Support* is not provided:

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

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

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

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

4> perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20], upon which the procedure ends;

3> else:

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

- is contained within the *carrierBandwidth* indicated in *uplinkConfigCommon* for the SCS of the initial uplink BWP or, for (e)RedCap UEs, RedCap-specific initial uplink BWP, if configured, and which

- is wider than or equal to the bandwidth of the initial BWP for the uplink or, for a (e)RedCap UE, of the RedCap-specific initial uplink BWP if configured;

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

- is contained within the *carrierBandwidth* indicated in *downlinkConfigCommon* for the SCS of the initial downlink BWP or, for (e)RedCap UEs, RedCap-specific initial downlink BWP, if configured, and which

- is wider than or equal to the bandwidth of the initial BWP for the downlink or, for a (e)RedCap UE, of the RedCap-specific initial downlink BWP if configured;

4> if the UE is aerial UE and it supports at least one frequency band in the *frequencyBandListAerial*, for FDD from *frequencyBandListAerial* for uplink, or for TDD from *frequencyBandListAerial* for downlink,for which SIB1 includes *nr-NS-PmaxListAerial* and the UE supports at least one of the *additionalSpectrumEmission* values in the *nr-NS-PmaxListAerial*:

5> select the first frequency band in the *frequencyBandListAerial*, for FDD from *frequencyBandListAerial* for uplink, or for TDD from *frequencyBandListAerial* for downlink,which the UE supports and for which SIB1 includes *nr-NS-PmaxListAerial* and the UE supports at least one of the *additionalSpectrumEmission* values inthe *nr-NS-PmaxListAerial*;

4> else if the UE is aerial UE and it supports at least one frequency band in the *frequencyBandListAerial*, for FDD from *frequencyBandListAerial* for uplink, or for TDD from *frequencyBandListAerial* for downlink,for which SIB1 does not include *nr-NS-PmaxListAerial* and the UE supports at least one of the *additionalSpectrumEmission* values in the *nr-NS-PmaxList* within *frequencyBandList* for the same NR frequency band number:

5> select the first frequency band in the *frequencyBandListAerial*, for FDD from *frequencyBandListAerial* for uplink, or for TDD from *frequencyBandListAerial* for downlink,which the UE supports and for which SIB1 does not include *nr-NS-PmaxListAerial* and the UE supports at least one of the *additionalSpectrumEmission* values in the *nr-NS-PmaxList* within *frequencyBandList* for the same NR frequency band number;

4> else if the UE is aerial UE and SIB1 includes *frequencyBandListAerial*:

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

5> perform cell re-selection to other cells on the same frequency as the barred cell as if *intraFreqReselection*, or *intraFreqReselectionRedCap* for RedCap UEs, or *intraFreqReselection-eRedCap* for eRedCap UEs is set to *notAllowed* as specified in TS 38.304 [20], upon which the procedure ends;

4> else:

5> select the first frequency band in the *frequencyBandList*, for FDD from *frequencyBandList* for uplink, or for TDD from *frequencyBandList* for downlink,which the UE supports and for which the UE supports at least one of the *additionalSpectrumEmission* values in *nr-NS-PmaxList*, if present, and for (e)RedCap UEs in FDD, if the *halfDuplexRedCapAllowed* is not present, for which the UE supports full-duplex FDD operation;

4> forward the *cellIdentity* to upper layers;

4> forward the *trackingAreaCode* to upper layers;

4> forward the *trackingAreaList* to upper layers, if included;

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

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

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

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

6> initiate an RNA update as specified in 5.3.13.8;

5> if configured to receive MBS multicast in RRC\_INACTIVE:

6> if SIB24 is not scheduled in SIB1 in the new cell after cell selection (i.e., different from the cell where the UE was configured to receive multicast in RRC\_CONNECTED) or in the cell after cell reselection; or

6> if the PTM configuration is not available on the multicast MCCH in the new cell after cell selection (i.e., different from the cell where the UE was configured to receive multicast in RRC\_CONNECTED) or in the cell after cell reselection for at least one multicast session that the UE has joined and for which the UE was indicated to stop monitoring G-RNTI;

7> initiate RRC connection resume procedure for multicast reception as specified in 5.3.13.1d;

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

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

4> forward the *UAC-AccessCategory1-SelectionAssistanceInfo* or *UAC-AC1-SelectAssistInfo* for the selected PLMN/SNPNto upper layers, if present and set to *a*, *b* or *c*;

4> if the UE is in SNPN access mode:

5> forward the *imsEmergencySupportForSNPN* indicators with the corresponding SNPN identities to upper layers, if present;

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

4> apply the specified PCCH configuration defined in 9.1.1.3;

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

5> use the stored version of the required SIB;

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

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

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

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

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

4> if the UE has a stored valid version of a posSIB, in accordance with clause 5.2.2.2.1, of one or several required posSIB(s), in accordance with clause 5.2.2.1:

5> use the stored version of the required posSIB;

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

5> for the SI message(s) that, according to the *posSI-SchedulingInfo* or *si-SchedulingInfo-v1700,* if present, contain at least one requested posSIB and for which *posSI-BroadcastStatus* in *posSchedulingInfoList* in *posSI-SchedulingInfo* or *si-BroadcastStatus* of the type2 SIB configured by *schedulingInfoList2* in *si-SchedulingInfo-v1700*, if present,is set to *broadcasting*:

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

5> for the SI message(s) that, according to the *posSI-SchedulingInfo* or *si-SchedulingInfo-v1700*, if present, contain at least one requested posSIB for which *posSI-BroadcastStatus* in *posSchedulingInfoList* in *posSI-SchedulingInfo* or *si-BroadcastStatus* of the type2 SIB configured by *schedulingInfoList2* in *si-SchedulingInfo-v1700*, if present,is set to *notBroadcasting*:

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

4> if the UE is aerial UE and, for the selected frequency band, it supports at least one *additionalSpectrumEmission* value indicated by *nr-NS-PmaxListAerial* within *frequencyBandListAerial* in *uplinkConfigCommon* for FDD or in *downlinkConfigCommon* for TDD:

5> apply the first listed *additionalSpectrumEmission* which it supports among the values indicated by *nr-NS-PmaxListAerial* for the selected frequency band within *frequencyBandListAerial* in *uplinkConfigCommon* for FDD or in *downlinkConfigCommon* for TDD;

4> else:

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

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

5> apply the *additionalPmax* for UL;

4> else:

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

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

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

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

4> if the UE is neither a RedCap nor an eRedCap UE, or for TDD if the UE is an (e)RedCap UE, or for FDD if the UE is an (e)RedCap UE and *halfDuplexRedCapAllowed* is present, or if the UE is an (e)RedCap UE and the (e)RedCap UE supports full-duplex FDD operation on the frequency bands indicated in the *frequencyBandList* for the *supplementaryUplink*; and

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

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

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

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

5> select the first frequency band in the *frequencyBandList* for the *supplementaryUplink* which the UE supports and for which the UE supports at least one of the *additionalSpectrumEmission* values in *nr-NS-PmaxList*, if present, and for (e)RedCap UEs in FDD, if the *halfDuplexRedCapAllowed* is not present, for which the UE supports full-duplex FDD operation;

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

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

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

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

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

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

5> else:

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

NOTE 2: For an out of coverage L2 U2N Remote UE or L2 Intermediate U2N Relay UE in RRC\_IDLE or RRC\_INACTIVE receiving SIB1 from its connected parent L2 U2N Relay UE, it is up to Remote UE implementation whether to consider and apply the following parameters: *frequencyBandList*, *carrierBandwidth*, *frequencyShift7p5khz*, frequency band, channel bandwidth, the configuration included in the *servingCellConfigCommon*, the specified PCCH configuration, *additionalSpectrumEmission*, *additionalPmax*, and *p-Max*.

2> else:

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

3> perform cell re-selection to other cells on the same frequency as the barred cell as if *intraFreqReselection*, or *intraFreqReselectionRedCap* for RedCap UEs, or *intraFreqReselection-eRedCap* for eRedCap UEs, or *intraFreqReselection2RxXR* for 2Rx XR UEs is set to *notAllowed* as specified in TS 38.304 [20];

=================================NEXT CHANGE=======================================

##### 5.2.2.4.13 Actions upon reception of *SIB12*

Upon receiving *SIB12*, the UE shall:

1> if the UE has stored at least one segment of *SIB12* and the value tag of *SIB12* has changed since a previous segment was stored:

2> discard all stored segments;

1> store the segment;

1> if all segments have been received:

2> assemble *SIB12-IEs* from the received segments;

2> if *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* is included in *SIB12-IEs*:

3> if configured to receive NR sidelink communication:

4> use the resource pool(s) indicated by *sl-RxPool* for NR sidelink communication reception, as specified in 5.8.7;

3> if configured to transmit NR sidelink communication:

4> use the resource pool(s) indicated by *sl-TxPoolSelectedNormal*, or *sl-TxPoolExceptional* for NR sidelink communication transmission, as specified in 5.8.8;

4> perform CBR measurement on the transmission resource pool(s) indicated by *sl-TxPoolSelectedNormal* or *sl-TxPoolExceptional* for NR sidelink communication transmission, as specified in 5.5.3.1;

4> use the synchronization configuration parameters for NR sidelink communication on frequencies included in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt*, as specified in 5.8.5;

3> if configured to perform SL-PRS measurement:

4> use the resource pool(s) indicated by *sl-RxPool* for SL-PRS measurement, as specified in 5.8.18.2;

3> if configured to transmit SL-PRS:

4> use the resource pool(s) indicated by *sl-TxPoolSelectedNormal*, or *sl-TxPoolExceptional* for SL-PRS transmission, as specified in 5.8.18.3;

4> perform CBR measurement on the transmission resource pool(s) indicated by *sl-TxPoolSelectedNormal* or *sl-TxPoolExceptional* for SL-PRS, as specified in 5.5.3.1;

4> use the synchronization configuration parameters for NR sidelink positioning on frequencies included in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt*, as specified in 5.8.5;

3> if configured to receive NR sidelink discovery:

4> use the resource pool(s) indicated by *sl-DiscRxPool* or *sl-RxPool* for NR sidelink discovery reception, as specified in 5.8.13.2;

3> if configured to transmit NR sidelink discovery:

4> if the UE is configured by upper layers to transmit[RIL]: Z451, SLRelay NR sidelink L2 U2N relay discovery messages and *sl-L2U2N-Relay* is included in SIB12; or

4> if the UE is configured by upper layers to transmit[RIL]: Z451, SLRelay NR sidelink L2 U2N relay discovery messages and *sl-L2U2N-MH-Relay* is included in SIB12; or

4>if the UE is configured by upper layers to transmit NR sidelink L3 U2N relay discovery messages and *sl-L3U2N-RelayDiscovery* is included in SIB12; or

4>if the UE is configured by upper layers to transmit NR sidelink non-relay discovery messages and *sl-NonRelayDiscovery* is included in SIB12; or

4> if the UE is configured by upper layers to transmit NR sidelink L2 U2U relay discovery messages and *sl-L2-U2U-Relay* is included in *SIB12*; or

4>if the UE is configured by upper layers to transmit NR sidelink L3 U2U relay discovery messages and *sl-L3-U2U-RelayDiscovery* is included in *SIB12*:

5> use the resource pool(s) indicated by *sl-DiscTxPoolSelected*, *sl-TxPoolExceptional* or *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission, as specified in 5.8.13.3;

5> perform CBR measurement on the transmission resource pool(s) indicated by *sl-TxPoolSelectedNormal*, *sl-DiscTxPoolSelected* or *sl-TxPoolExceptional* for NR sidelink discovery transmission, as specified in 5.5.3.1;

5> use the synchronization configuration parameters for NR sidelink discovery on frequencies included in *sl-FreqInfoList*, as specified in 5.8.5;

2> if *sl-RadioBearerConfigList* or *sl-RLC-BearerConfigList* is included in *sl-ConfigCommonNR*:

3> perform sidelink DRB addition/modification/release as specified in 5.8.9.1a.1/5.8.9.1a.2;

3> if *sl-RLC-BearerConfigListSizeExt* is included in *SIB12-IEs*:

4> perform additional sidelink RLC bearer addition/modification/release as specified in 5.8.9.1a.5/5.8.9.1a.6;

2> if *sl-MeasConfigCommon* is included in *sl-ConfigCommonNR*:

3> store the NR sidelink measurement configuration;

2> if *sl-DRX-ConfigCommonGC-BC* is included in *SIB12-IEs*:

3> store the NR sidelink DRX configuration and configure lower layers to perform sidelink DRX operation for groupcast and broadcast as specified in TS 38.321 [3];

1> if the UE is acting as L2 U2N Remote UE:

2> if the *sl-TimersAndConstantsRemoteUE* is included in *SIB12*:

3> use values for timers T300, T301 and T319 as included in the *sl-TimersAndConstantsRemoteUE* received in *SIB12*;

2> else:

3> use values for timers T300, T301 and T319 as included in the *ue-TimersAndConstants* received in *SIB1*;

The UE should discard any stored segments for *SIB12* if the complete *SIB12* has not been assembled within a period of 3 hours. The UE shall discard any stored segments for *SIB12* upon cell (re-)selection.

NOTE: The L2 U2U UE is allowed to use previous configuration based on SIB12 before receiving dedicated configuration during and immediately after state transition from idle/inactive to connected.

=================================NEXT CHANGE=======================================

### 5.3.2 Paging

#### 5.3.2.1 General



Figure 5.3.2.1-1: Paging

The purpose of this procedure is:

- to transmit paging information to a UE in RRC\_IDLE or RRC\_INACTIVE.

- to transmit paging information for a L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE to its serving L2 U2N Relay UE in any RRC state.

#### 5.3.2.2 Initiation

The network initiates the paging procedure by transmitting the *Paging* message at the UE's paging occasion as specified in TS 38.304 [20]. The network may address multiple UEs within a *Paging* message by including one *PagingRecord* for each UE. The network may also include one or multiple TMGI(s) in the *Paging* message to page UEs for specific MBS multicast session(s).

#### 5.3.2.3 Reception of the *Paging* *message* by the UE or *PagingRecord* by the L2 U2N Remote UE

Upon receiving the *Paging* message by the UE or receiving *PagingRecord* from its connected parent L2 U2N Relay UE by a L2 U2N Remote UE, the UE shall:

1> if in RRC\_IDLE, for each of the *PagingRecord*, if any, included in the *Paging* message, or

1> if in RRC\_IDLE, for the *PagingRecord*, if any, included in the *UuMessageTransferSidelink* message received from the connected parent L2 U2N Relay UE:

2> if the *ue-Identity* included in the *PagingRecord* matches the UE identity allocated by upper layers:

3> if upper layers indicate the support of paging cause:

4> forward the *ue-Identity,* *accessType* (if present) and paging cause (if determined) to the upper layers;

3> else:

4> forward the *ue-Identity* and *accessType* (if present) to the upper layers;

NOTE 1: If the parent L2 U2N Relay UE supports the MUSIM feature, it can forward the paging cause to the connected L2 U2N Remote UE or to the child UE.

1> if in RRC\_INACTIVE, for each of the *PagingRecord*, if any, included in the *Paging* message, or

1> if in RRC\_INACTIVE, for the *PagingRecord*, if any, included in the *UuMessageTransferSidelink* message received from the connected parent L2 U2N Relay UE:

2> if the *ue-Identity* included in the *PagingRecord* matches the UE's stored *fullI-RNTI*:

3> if the UE is configured by upper layers with Access Identity 1:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mps-PriorityAccess*;

3> else if the UE is configured by upper layers with Access Identity 2:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mcs-PriorityAccess*;

3> else if the UE is configured by upper layers with one or more Access Identities equal to 11-15:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *highPriorityAccess*;

3> else if *mt-SDT* indication was included in the *Paging* message and if the conditions for initiating SDT for a resume procedure initiated in response to RAN paging according to 5.3.13.1b are fulfilled:

4> if *pagingGroupList* was not included in the *Paging* message; or

4> if *pagingGroupList* was included in the *Paging* message but the UE has not joined any MBS session(s) indicated by the *TMGI(s)* included in the *pagingGroupList*; or

4> if *pagingGroupList* was included in the *Paging* message, all the MBS session(s) indicated by the TMGI(s) included in the *pagingGroupList* that the UE has joined are configured to be received in RRC\_INACTIVE, and *inactiveReceptionAllowed* was included for all these MBS session(s):

5> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mt-SDT*;

NOTE 1a: If a UE receives a *Paging* message including *mt-SDT* indication and *inactiveReceptionAllowed* indications for all the multicast session(s) the UE has joined and the UE initiates RRC connection resume, the UE starts monitoring the corresponding G-RNTI(s), if configured, and if multicast MCCH is present, the UE starts monitoring the Multicast MCCH-RNTI and acquires the *MBSMulticastConfiguration* message on multicast MCCH.

4> else:

5> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mt-Access*;

3> else:

4> initiate the RRC connection resumption procedure according to 5.3.13 with *resumeCause* set to *mt-Access*;

NOTE 2: If both conditions for initiating MT-SDT and MO-SDT according to 5.3.13.1b are fulfilled, UE may initiate RRC connection resumption procedure for MT-SDT or MO-SDT based on implementation.

NOTE 3: A MUSIM UE may not initiate the RRC connection resumption procedure, e.g. when it decides not to respond to the *Paging* message due to UE implementation constraints as specified in TS 24.501 [23].

2> else if the *ue-Identity* included in the *PagingRecord* matches the UE identity allocated by upper layers:

3> if upper layers indicate the support of paging cause:

4> forward the *ue-Identity*, *accessType* (if present) and paging cause (if determined) to the upper layers;

3> else:

4> forward the *ue-Identity* and *accessType* (if present) to the upper layers;

3> perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with release cause 'other';

1> if in RRC\_IDLE, for each *TMGI* included in *pagingGroupList*, if any, included in the *Paging* message:

2> if the UE has joined an MBS session indicated by the *TMGI* included in the *pagingGroupList*:

3> forward the *TMGI* to the upper layers;

1> if in RRC\_INACTIVE and the UE has joined one or more MBS session(s) indicated by the *TMGI(s)* included in the *pagingGroupList*:

2> if *PagingRecordList* is not included in the *Paging* message; or

2> if none of the *ue-Identity* included in any of the *PagingRecord* matches the UE identity allocated by upper layers or the UE's stored *fullI-RNTI*:

3> if the UE is not configured to receive multicast in RRC\_INACTIVE for at least one of the MBS sessions indicated by the *TMGI(s)* included in *pagingGroupList* that the UE has joined; or

3> if *inactiveReceptionAllowed* is not included for at least one of the MBS sessions indicated by the *TMGI(s)* included in *pagingGroupList* that the UE has joined:

4> initiate the RRC connection resumption procedure according to 5.3.13.1d;

3> else:

4> start monitoring the G-RNTI(s), if configured, corresponding to the *TMGI(s)*;

4> if the UE was notified to stop monitoring the G-RNTI(s) for all the joined multicast sessions that are configured for reception in RRC\_INACTIVE:

5> apply the multicast PTM configuration provided in *RRCRelease*;

5> if multicast MCCH is present:

6> start monitoring the Multicast MCCH-RNTI;

6> acquire the *MBSMulticastConfiguration* message on multicast MCCH;

4> else if the UE was notified to stop monitoring the G-RNTI for at least one of the multicast sessions indicated by the *TMGI(s)* included in *pagingGroupList* for which the PTM configuration was not included in *RRCRelease* message:

5> apply the multicast PTM configuration provided in *RRCRelease*;

5> acquire the *MBSMulticastConfiguration* message on multicast MCCH;

2> else if the *ue-Identity* included in any of the *PagingRecord* matches the UE identity allocated by upper layers:

3> forward the *TMGI(s)* to the upper layers;

1> if the UE is acting as a L2 U2N Relay UE in case of single hop or L2 Last U2N Relay UE, for each of the *PagingRecord*, if any, included in the *Paging* message:

2> if the *ue-Identity* included in the *PagingRecord* in the *Paging* message matches the UE identity in *sl-PagingIdentityRemoteUE* included in *sl-PagingInfo-RemoteUE* [RIL]: O500, SLRelay received in *RemoteUEInformationSidelink* message from a L2 U2N Remote UE or from a child L2 U2N Relay UE:

3> inititate the Uu Message transfer in sidelink to that UE as specified in 5.8.9.9;

=================================NEXT CHANGE=======================================

### 5.3.3 RRC connection establishment

#### 5.3.3.1 General



Figure 5.3.3.1-1: RRC connection establishment, successful



Figure 5.3.3.1-2: RRC connection establishment, network reject

The purpose of this procedure is to establish an RRC connection. RRC connection establishment involves SRB1 establishment. The procedure is also used to transfer the initial NAS dedicated information/ message from the UE to the network.

The network applies the procedure e.g.as follows:

- When establishing an RRC connection;

- When UE is resuming or re-establishing an RRC connection, and the network is not able to retrieve or verify the UE context. In this case, UE receives *RRCSetup* and responds with *RRCSetupComplete*.

#### 5.3.3.1a Conditions for establishing RRC Connection for NR sidelink communication/discovery/V2X sidelink communication/MP operation

For NR sidelink communication/discovery, an RRC connection establishment is initiated only in the following cases:

1> if configured by upper layers to transmit NR sidelink communication and related data is available for transmission:

2> if the frequency on which the UE is configured to transmit NR sidelink communication is included in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* within *SIB12* provided by the cell on which the UE camps; and if the valid version of *SIB12* does not include *sl-TxPoolSelectedNormal* for the concerned frequency;

1> if configured by upper layers to transmit NR sidelink discovery and related data is available for transmission:

2> if the UE is configured by upper layers to transmit NR sidelink L2[RIL]: Z451, SLRelay U2N relay discovery messages and *sl-L2U2N-Relay* is included in *SIB12*; or

[RIL]: Z452, SLRelay2> if the UE is configured by upper layers to transmit NR sidelink L3 U2N relay discovery messages and *sl-L3U2N-RelayDiscovery* is included in *SIB12*; or

2> if the UE is configured by upper layers to transmit NR sidelink non-relay discovery messages and *sl-NonRelayDiscovery* is included in *SIB12*:

3> if the frequency on which the UE is configured to transmit NR sidelink discovery is included in *sl-FreqInfoList* within *SIB12* provided by the cell on which the UE camps; and if the valid version of *SIB12* includes neither *sl-DiscTxPoolSelected* nor *sl-TxPoolSelectedNormal* for the concerned frequency;

For L2 U2N Relay UE in RRC\_IDLE, an RRC connection establishment is initiated in the following cases:

1> if any message is received from a L2 U2N Remote UE or from a child U2N Relay UE via SL-RLC0 as specified in 9.1.1.4 or SL-RLC1 as specified in 9.2.4; or

1> if *RemoteUEInformationSidelink* containing the *connectionForMP* is received from a L2 U2N Remote UE as specified in 5.8.9.8.3;

For V2X sidelink communication, an RRC connection is initiated only when the conditions specified for V2X sidelink communication in clause 5.3.3.1a of TS 36.331 [10] are met.

NOTE 1: Upper layers initiate an RRC connection (except if the RRC connection is initiated at the L2 U2N Relay UE upon reception of a message from a L2 U2N Remote UE or from a child U2N Relay UE via SL-RLC0 or SL-RLC1, or upon reception of *RemoteUEInformationSidelink* message containing the *connectionForMP*). The interaction with NAS is left to UE implementation.

For N3C relay UE in RRC\_IDLE, an RRC connection establishment is initiated when a N3C remote UE indicates it to enter RRC\_CONNECTED state.

NOTE 2: How/when the N3C remote UE to indicate N3C relay UE to enter RRC\_CONNECTED state is left to UE implementation, e.g. before reporting relay UE information with non-3GPP connection(s).

#### 5.3.3.1b Void

#### 5.3.3.2 Initiation

The UE initiates the procedure when upper layers request establishment of an RRC connection while the UE is in RRC\_IDLE and it has acquired essential system information, or for sidelink communication as specified in clause 5.3.3.1a.

The UE shall ensure having valid and up to date essential system information as specified in clause 5.2.2.2 before initiating this procedure.

Upon initiation of the procedure, the UE shall:

1> if the upper layers provide an Access Category and one or more Access Identities upon requesting establishment of an RRC connection:

2> perform the unified access control procedure as specified in 5.3.14 using the Access Category and Access Identities provided by upper layers;

3> if the access attempt is barred, the procedure ends;

1> if the upper layers provide NSAG information and one or more S-NSSAI(s) triggering the access attempt (TS 23.501 [32] and TS 24.501 [23]):

2> apply the NSAG with highest NSAG priority among the NSAGs that are included in *SIB1* (i.e., in *FeatureCombination* and/or in *RA-PrioritizationSliceInfo*)*,* and that are associated with the S-NSSAI(s) triggering the access attempt, in the Random Access procedure (TS 38.321 [3], clause 5.1);

NOTE: If there are multiple NSAGs with the same highest NAS-provided NSAG priority identified for access attempt as above, it is left to UE implementation to select the NSAG to be applied in the Random Access procedure.

1> if the UE is acting as L2 U2N Remote UE or is acting as L2 Intermediate U2N Relay UE:

2> establish a SRAP entity as specified in TS 38.351 [66], if no SRAP entity has been established;

2> apply the specified configuration of SL-RLC0 as specified in 9.1.1.4;

2> apply the SDAP configuration and PDCP configuration as specified in 9.1.1.2 for SRB0;

1> else:

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*;

1> start timer T300;

1> initiate transmission of the *RRCSetupRequest* message in accordance with 5.3.3.3;

#### 5.3.3.3 Actions related to transmission of *RRCSetupRequest* message

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

1> set the *ue-Identity* as follows:

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

3> set the *ue-Identity* to *ng-5G-S-TMSI-Part1*;

2> else:

3> draw a 39-bit random value in the range 0..239-1 and set the *ue-Identity* to this value;

NOTE 1: Upper layers provide the *5G-S-TMSI* if the UE is registered in the TA of the current cell.

1> if the establishment of the RRC connection is the result of release with redirect with *mpsPriorityIndication* (either in NR or E-UTRAN):

2> set the *establishmentCause* to *mps-PriorityAccess*;

1> else:

2> set the *establishmentCause* in accordance with the information received from upper layers;

NOTE 2: In case the L2 U2N Relay UE initiates RRC connection establishment triggered either by reception of message from a L2 U2N Remote UE or from a child UE via SL-RLC0 or SL-RLC1, or by reception of message *RemoteUEInformationSidelink* containing the *connectionForMP*, as specified in 5.3.3.1a, the L2 U2N Relay UE sets the *establishmentCause* by implementation, but: (1) for SL-RLC0, it can only set the *emergency*, *mps-PriorityAccess*, or *mcs-PriorityAccess* as *establishmentCause* if the same cause value is in the message received from the L2 U2N Remote UE or from a child UE via SL-RLC0; and (2) for SL-RLC1, it sets the *establishmentCause* to *emergency* if the message received from the L2 U2N Remote UE or from a child UE via SL-RLC1 is over PC5 link established for emergency service as indicated by upper layer [72].

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

2> indicate TA report initiation to lower layers;

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

If the UE is an (e)RedCap UE and the RedCap-specific initial downlink BWP is not associated with CD-SSB, the UE may continue cell re-selection related measurements as well as cell re-selection evaluation, otherwise the UE shall continue cell re-selection related measurements as well as cell re-selection evaluation. If the conditions for cell re-selection are fulfilled, the UE shall perform cell re-selection as specified in 5.3.3.6.

NOTE 3: For L2 U2N Remote UE or L2 Intermediate U2N Relay UE in RRC\_IDLE, the cell (re)selection procedure as specified in TS 38.304 [20] and relay (re)selection procedure as specified in 5.8.15.3 are performed independently and up to UE implementation to select either a cell or a L2 U2N Relay UE.

#### 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 or L2 Intermediate U2N Relay UE;

1> consider the current cell to be the PCell;

1> perform the L2 U2N Remote UE or L2 Intermediate U2N Relay UE [RIL]: H450, SLRelay 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*; or

1> 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*:

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:

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

#### 5.3.3.5 Reception of the *RRCReject* by the UE

The UE shall:

1> perform the actions as specified in 5.3.15;

#### 5.3.3.6 Cell re-selection or cell selection or relay (re)selection while T390, T300 or T302 is running (UE in RRC\_IDLE)

The UE shall:

1> if cell reselection occurs while T300 or T302 is running; or

1> if relay (re)selection or cell selection by a L2 U2N Remote UE or by a L2 Intermediate U2N Relay UE, occurs while T300 is running; or

1> if cell changes due to relay (re)selection or cell selection by a L2 U2N Remote UE or L2 Intermediate U2N Relay UE while T302 is running:

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

1> else:

2> if cell selection or reselection occurs while T390 is running; or

2> cell change due to relay selection or reselection occurs while T390 is running:

3> stop T390 for all access categories;

3> perform the actions as specified in 5.3.14.4.

#### 5.3.3.7 T300 expiry

The UE shall:

1> if timer T300 expires:

2> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established (except broadcast MRBs);

2> if the UE supports RRC Connection Establishment failure with temporary offset and the T300 has expired a consecutive *connEstFailCount* times on the same cell for which *connEstFailureControl* is included in *SIB1*:

3> for a period as indicated by *connEstFailOffsetValidity*:

4> use *connEstFailOffset* for the parameter *Qoffsettemp* for the concerned cell when performing cell selection and reselection according to TS 38.304 [20] and TS 36.304 [27];

NOTE 1: When performing cell selection, if no suitable or acceptable cell can be found, it is up to UE implementation whether to stop using *connEstFailOffset* for the parameter *Qoffsettemp* during *connEstFailOffsetValidity* for the concerned cell.

2> if the UE supports multiple CEF report:

3> if the UE is not in SNPN access mode and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-identity* in *networkIdentity* stored in *VarConnEstFailReport*; or

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

4> if the cell identity of current cell is not equal to the cell identity stored in *measResultFailedCell* in *VarConnEstFailReport* and if the *maxCEFReport-r17* has not been reached:

5> append the *VarConnEstFailReport* as a new entry in the *VarConnEstFailReportList*;

2> if the UE is not in SNPN access mode and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* and if the RPLMN is not equal to *plmn-identity* in *networkIdentity* stored in *VarConnEstFailReport*; or

2> if the UE is in SNPN access mode and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* and if the registered SNPN identity is not equal to *snpn-Identity* in *networkIdentity* stored in *VarConnEstFailReport*; or

2> if the cell identity of current cell is not equal to the cell identity stored in *measResultFailedCell* in *VarConnEstFailReport*:

3> reset the *numberOfConnFail* to 0;

2> if the UE supports multiple CEF report and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReportList* and if the RPLMN is not equal to *plmn-identity* in *networkIdentity* stored in any entry of *VarConnEstFailReportList*;or

2> if the UE supports multiple CEF report and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReportList* and if the registered SNPN identity is not equal to *snpn-Identity* in *networkIdentity* stored in any entry of *VarConnEstFailReportList*:

3> clear the content included in *VarConnEstFailReportList*;

2> clear the content included in *VarConnEstFailReport* except for the *numberOfConnFail*, if any;

2> store the following connection establishment failure information in the *VarConnEstFailReport* by setting its fields as follows:

3> if the UE is not in SNPN access mode:

4> set the *plmn-Identity* in *networkIdentity* to the PLMN selected by upper layers (see TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityInfoList* in *SIB1*;

3> else if the UE is in SNPN access mode:

4> set the *snpn-Identity* in *networkIdentity* to include the SNPN identity selected by upper layers (see TS 24.501 [23]) from the list of SNPN(s) included in the *npn-IdentityInfoList* in *SIB1*;

3> set the *measResultFailedCell* to include the global cell identity, tracking area code, the cell level and SS/PBCH block level RSRP, and RSRQ, and SS/PBCH block indexes, of the failed cell based on the available SSB measurements collected up to the moment the UE detected connection establishment failure;

3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements for at most the following number of neighbouring cells: 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency/ set of frequencies per RAT and according to the following:

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

NOTE 2: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 38.133 [14].

3> if available, set the *locationInfo* as follows:

4> if available, set the *commonLocationInfo* to include the detailed location information;

4> if available, set the *bt-LocationInfo* to include the Bluetooth measurement results, in order of decreasing RSSI for Bluetooth beacons;

4> if available, set the *wlan-LocationInfo* to include the WLAN measurement results, in order of decreasing RSSI for WLAN APs;

4> if available, set the *sensor-LocationInfo* to include the sensor measurement results as follows;

5> if available, include the *sensor-MeasurementInformation*;

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

NOTE 3: Which location information related configuration is used by the UE to make the *locationInfo* available for inclusion in the *VarConnEstFailReport* is left to UE implementation.

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

3> if the *numberOfConnFail* is smaller than 8:

4> increment the *numberOfConnFail* by 1;

2> inform upper layers about the failure to establish the RRC connection, upon which the procedure ends;

The UE may discard the connection establishment failure or connection resume failure information, i.e. release the UE variable *VarConnEstFailReport* and the UE variable *VarConnEstFailReportList*, 48 hours after the last connection establishment failure is detected.

The L2 U2N Relay UE either indicates to upper layers (to trigger PC5 unicast link release with its child UE(s)) or sends *NotificationMessageSidelink* message to the connected L2 U2N Remote UE(s) or to the child UE(s) in accordance with 5.8.9.10.

#### 5.3.3.8 Abortion of RRC connection establishment

If upper layers abort the RRC connection establishment procedure, due to a NAS procedure being aborted as specified in TS 24.501 [23], while the UE has not yet entered RRC\_CONNECTED, the UE shall:

1> stop timer T300, if running;

1> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established (except broadcast MRBs).

The L2 U2N Relay UE either indicates to upper layers (to trigger PC5 unicast link release with its child UE(s)) or sends *NotificationMessageSidelink* message to the connected L2 U2N Remote UE(s) or to the child UE(s) in accordance with 5.8.9.10.

The L2 U2N Remote UE or [RIL]: O501, SLRelay the L2 First U2N Relay UE or L2 Intermediate U2N Relay UE indicates to upper layers to trigger PC5 unicast link release with its connected parent L2 U2N Relay UE.

=================================NEXT CHANGE=======================================

### 5.3.5 RRC reconfiguration

#### 5.3.5.1 General



Figure 5.3.5.1-1: RRC reconfiguration, successful



Figure 5.3.5.1-2: RRC reconfiguration, failure

The purpose of this procedure is to modify an RRC connection, e.g. to establish/modify/release RBs/BH RLC channels/Uu Relay RLC channels/PC5 Relay RLC channels, to perform reconfiguration with sync, to setup/modify/release measurements, to add/modify/release SCells and cell groups, to add/modify/release conditional reconfiguration configuration, to add/modify/release LTM configuration, and to add/modify/release MP configuration. As part of the procedure, NAS dedicated information may be transferred from the Network to the UE.

RRC reconfiguration to perform reconfiguration with sync includes, but is not limited to, the following cases:

- reconfiguration with sync and security key refresh, involving RA to the PCell/PSCell, MAC reset, refresh of security and re-establishment of RLC and PDCP triggered by explicit indicators;

- reconfiguration with sync but without security key refresh, involving RA to the PCell/PSCell, MAC reset and RLC re-establishment and PDCP data recovery (for AM DRB or AM MRB) triggered by explicit indicators;

- reconfiguration with sync for DAPS and security key refresh, involving RA to the target PCell, establishment of target MAC, and

- for non-DAPS bearer: refresh of security and re-establishment of RLC and PDCP triggered by explicit indicators;

- for DAPS bearer: establishment of RLC for the target PCell, refresh of security and reconfiguration of PDCP to add the ciphering function, the integrity protection function and ROHC function of the target PCell;

- for SRB: refresh of security and establishment of RLC and PDCP for the target PCell;

- reconfiguration with sync for DAPS but without security key refresh, involving RA to the target PCell, establishment of target MAC, and

- for non-DAPS bearer: RLC re-establishment and PDCP data recovery (for AM DRB or AM MRB) triggered by explicit indicators.

- for DAPS bearer: establishment of RLC for target PCell, reconfiguration of PDCP to add the ciphering function, the integrity protection function and ROHC function of the target PCell;

- for SRB: establishment of RLC and PDCP for the target PCell.

- reconfiguration with sync for direct-to-indirect path switch or indirect-to-indirect path switch, not involving RA at target side, involving re-establishment of PDCP /PDCP data recovery (for AM DRB) triggered by explicit indicators;

- reconfiguration with sync for LTM cell switch (without security key refresh), and

- involving or not involving RA to the target LTM candidate SpCell according to a network indication;

- MAC reset;

- depending on a network indication, involving or not involving re-establishment of RLC and PDCP data recovery (for AM DRB).

In (NG)EN-DC and NR-DC, SRB3 can be used for measurement configuration and reporting, for UE assistance (re-)configuration and reporting for power savings, for IP address (re-)configuration and reporting for IAB-nodes, to (re-)configure MAC, RLC, BAP, physical layer and RLF timers and constants of the SCG configuration, to reconfigure PDCP for DRBs associated with the S-KgNB or SRB3, to reconfigure SDAP for DRBs associated with S-KgNB in NGEN-DC and NR-DC, to add/modify/release conditional PSCell change configuration or subsequent CPAC configuration, and to add/modify/release the LTM configuration associated with the SCG (only in NR-DC), provided that the (re-)configuration does not require any MN involvement, and to transmit RRC messages between the MN and the UE during fast MCG link recovery. In (NG)EN-DC and NR-DC, only *measConfig*, *radioBearerConfig, conditionalReconfiguration, ltm-Config* (only in NR-DC)*, bap-Config*, *iab-IP-AddressConfigurationList, otherConfig, appLayerMeasConfig* and/or *secondaryCellGroup* are included in *RRCReconfiguration* received via SRB3, except when *RRCReconfiguration* is received within *DLInformationTransferMRDC*.

When a clause of 5.3.5 is executed due to an LTM cell switch execution (i.e., as specified in 5.3.5.18.6) or due to a conditional reconfiguration execution for subsequent CPAC (i.e., as specified in 5.3.5.13.8), every appearance of "the received" before *RRCReconfiguration* message, before a field name, or before an IE name, refers to the *RRCReconfiguration* message that the UE applies, as specified in 5.3.5.18.6, 5.3.5.13.8, or the field or IE in that *RRCReconfiguration* message.

#### 5.3.5.2 Initiation

The Network may initiate the RRC reconfiguration procedure to a UE in RRC\_CONNECTED. The Network applies the procedure as follows:

- the establishment of RBs (other than SRB1, that is established during RRC connection establishment) is performed only when AS security has been activated;

- the establishment of BH RLC Channels for IAB is performed only when AS security has been activated;

- the configuration of NCR-Fwd is performed only when AS security has been activated;

- the establishment of Uu Relay RLC channels and PC5 Relay RLC channels (other than SL-RLC0 and SL-RLC1) for L2 U2N Relay UE in case of single hop or for L2 Last U2N Relay UE is performed only when AS security has been activated, and the establishment of PC5 Relay RLC channels for L2 U2N Remote UE or for L2 Intermediate U2N Relay UE (other than SL-RLC0 and SL-RLC1) is performed only when AS security has been activated;

- the establishment of PC5 Relay RLC channels for L2 U2U Relay UE and L2 U2U Remote UE is performed only when AS security has been activated;

- the addition of Secondary Cell Group and SCells is performed only when AS security has been activated;

- the *reconfigurationWithSync* is included in *secondaryCellGroup* only when at least one RLC bearer or BH RLC channel is setup in SCG;

- the *reconfigurationWithSync* is included in *masterCellGroup* only when AS security has been activated, and SRB2 with at least one DRB or multicast MRB or, for IAB and NCR, SRB2, have been setup and not suspended;

- the *conditionalReconfiguration* for CPC is included only when at least one RLC bearer is setup in SCG;

- the *conditionalReconfiguration* for CHO, CPA, or subsequent CPAC is included only when AS security has been activated, and SRB2 with at least one DRB or multicast MRB or, for IAB, SRB2, are setup and not suspended;

- the addition of indirect path for MP is performed only when AS security has been activated;

- the *ltm-Config* for LTM on the MCG is included only when AS security has been activated, and SRB2 with at least one DRB are setup and not suspended;

- the *ltm-Config* for LTM on the SCG is included only when at least one RLC bearer is setup in SCG.

#### 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; 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;

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;

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):

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 in case of single hop or for L2 Last 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 *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,

2> 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:

3> release dedicated preambles provided in *rach-ConfigDedicated* within *reconfigurationWithSync*, if configured;

3> release dedicated msgA PUSCH resources provided in *rach-ConfigDedicated* within *reconfigurationWithSync*, if configured;

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) with the timer value set to the value in the *musim-LeaveAssistanceConfig* 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 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=======================================

#### 5.3.5.5 Cell Group configuration

##### 5.3.5.5.1 General

The network configures the UE with Master Cell Group (MCG), and zero or one Secondary Cell Group (SCG). In (NG)EN-DC, the MCG is configured as specified in TS 36.331 [10], and for NE-DC, the SCG is configured as specified in TS 36.331 [10]. The network provides the configuration parameters for a cell group in the *CellGroupConfig* IE.

The UE performs the following actions based on a received *CellGroupConfig* IE:

1> if the *CellGroupConfig* contains the *spCellConfig* with *reconfigurationWithSync*:

2> perform Reconfiguration with sync according to 5.3.5.5.2;

2> resume all suspended radio bearers except the SRBs for the source cell group, and resume SCG transmission for all radio bearers, and resume BH RLC channels and resume SCG transmission for BH RLC channels for IAB-MT, if suspended;

NOTE 1: If the SCG is deactivated, resuming SCG transmission for all radio bearers does not imply that PDCP PDUs can be transmitted or received on SCG RLC bearers.

1> if the *CellGroupConfig* contains the *rlc-BearerToReleaseList or rlc-BearerToReleaseListExt*:

2> perform RLC bearer release as specified in 5.3.5.5.3;

1> if the *CellGroupConfig* contains the *rlc-BearerToAddModList*:

2> perform the RLC bearer addition/modification as specified in 5.3.5.5.4;

1> if the *CellGroupConfig* contains the *mac-CellGroupConfig*:

2> configure the MAC entity of this cell group as specified in 5.3.5.5.5;

1> if the *CellGroupConfig* contains the *sCellToReleaseList*:

2> perform SCell release as specified in 5.3.5.5.8;

1> if the *CellGroupConfig* contains the *spCellConfig*:

2> configure the SpCell as specified in 5.3.5.5.7;

1> if the *CellGroupConfig* contains the *sCellToAddModList*:

2> perform SCell addition/modification as specified in 5.3.5.5.9;

1> if the *CellGroupConfig* contains the *bh-RLC-ChannelToReleaseList*:

2> perform BH RLC channel release as specified in 5.3.5.5.10;

1> if the *CellGroupConfig* contains the *bh-RLC-ChannelToAddModList*:

2> perform the BH RLC channel addition/modification as specified in 5.3.5.5.11;

1> if the *CellGroupConfig* contains the *uu-RelayRLC-ChannelToReleaseList*:

2> perform Uu Relay RLC channel release as specified in 5.3.5.5.12;

1> if the *CellGroupConfig* contains the *uu-RelayRLC-ChannelToAddModList*:

2> perform the Uu Relay RLC channel addition/modification as specified in 5.3.5.5.13;

1> if the *CellGroupConfig* contains the *ncr-FwdConfig*:

2> perform the NCR-Fwd configuration as specified in 5.3.5.5.14;

1> if the *CellGroupConfig* contains the *autonomousDenialParameters*:

2> consider itself to be allowed to deny any transmission in a particular UL slot if during the number of slots indicated by *autonomousDenialValidity*, preceding and including this particular slot, it autonomously denied fewer UL slots than indicated by *autonomousDenialSlots* within the same cell group;

NOTE 2: When counting the number of denied UL slots, the UE sums up the denied UL slots across all serving cells within the same cell group. When counting the number of slots indicated by *autonomousDenialValidity*, the UE sums up the UL slots across all serving cells within the same cell group.

NOTE 3: When multiple denied UL slots across all serving cells partially or fully overlap in the time domain, the number of denied UL slots across all serving cells is counted as one denied UL slot, based on the longest slot.

##### 5.3.5.5.2 Reconfiguration with sync

The UE shall perform the following actions to execute a reconfiguration with sync.

1> if the AS security is not activated, perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with the release cause '*other*' upon which the procedure ends;

1> stop timer T430 if running;

1> if no DAPS bearer is configured:

2> stop timer T310 for the corresponding SpCell, if running;

1> if this procedure is executed for the MCG:

2> if timer T316 is running;

3> stop timer T316;

3> if the UE supports RLF-Report for fast MCG recovery procedure as specified in TS 38.306 [26]:

4> set the *elapsedTimeT316* in the *VarRLF-Report* to the value of the elapsed time of the timer T316;

4> set the *pSCellId* in the *VarRLF-Report* to the global cell identity of the PSCell, if available, otherwise to the physical cell identity and carrier frequency of the PSCell;

3> else:

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

2> resume MCG transmission, if suspended.

1> stop timer T312 for the corresponding SpCell, if running;

1> if *sl-PathSwitchConfig* is included:

2> apply the value of the *newUE-Identity* as the C-RNTI;

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

3> if the UE is L2 U2N remote UE at source side:

4> indicate to upper layer to trigger PC5 unicast link release with the source L2 U2N Relay UE;

3> consider the target L2 U2N Relay UE to be the one indicated by the *targetRelayUE-Identity* in the *sl-PathSwitchConfig*;

3> start timer T420 for the corresponding target L2 U2N Relay UE with the timer value set to *t420*, as included in the *sl-PathSwitchConfig*;

3> indicate to upper layer (to trigger the PC5 unicast link establishment) with the target L2 U2N Relay UE indicated by the *targetRelayUE-Identity*;

3> apply the default configuration of SL-RLC1 as defined in 9.2.4 for SRB1;

2> else:

3> consider the connected L2 U2N Relay UE on the indirect path as the target L2 U2N relay UE, and maintain the PC5 connection with the L2 U2N Relay UE;

1> else (*sl-PathSwitchConfig* is not included):

2> if this procedure is executed for the MCG or if this procedure is executed for an SCG not indicated as deactivated in the E-UTRA or NR RRC message in which the *RRCReconfiguration* message is embedded:

3> start timer T304 for the corresponding SpCell with the timer value set to *t304*, as included in the *reconfigurationWithSync*;

2> if the *frequencyInfoDL* is included:

3> consider the target SpCell to be one on the SSB frequency indicated by the *frequencyInfoDL* with a physical cell identity indicated by the *physCellId*;

2> else:

3> consider the target SpCell to be one on the SSB frequency of the source SpCell with a physical cell identity indicated by the *physCellId*;

2> if this procedure is performed due to an LTM cell switch execution:

3> start synchronising to the DL of the indicated LTM candidate cell, if no DL synchronization for the indicated LTM candidate cell has been already acquired;

2> else:

3> start synchronising to the DL of the target SpCell;

2> apply the specified BCCH configuration defined in 9.1.1.1 for the target SpCell;

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

2> if *NTN-Config* is configured for the target cell:

3> start timer T430 with the timer value set to *ntn-UlSyncValidityDuration* from the subframe indicated by *epochTime*, according to the target cell *NTN-Config*;

NOTE 1: The UE should perform the reconfiguration with sync as soon as possible following the reception of the RRC message triggering the reconfiguration with sync, which could be before confirming successful reception (HARQ and ARQ) of this message.

NOTE 2: The UE may omit reading the *MIB* if the UE already has the required timing information, or the timing information is not needed for random access, or if not needed for RACH-less initial UL transmission.

NOTE 2a: A UE with DAPS bearer does not monitor for system information updates in the source PCell.

2> If any DAPS bearer is configured:

3> create a MAC entity for the target cell group with the same configuration as the MAC entity for the source cell group;

3> for each DAPS bearer:

4> establish an RLC entity or entities for the target cell group, with the same configurations as for the source cell group;

4> establish the logical channel for the target cell group, with the same configurations as for the source cell group;

NOTE 2b: In order to understand if a DAPS bearer is configured, the UE needs to check the presence of the field *daps-Config* within the *RadioBearerConfig* IE received in *radioBearerConfig* or *radioBearerConfig2*.

3> for each SRB:

4> establish an RLC entity for the target cell group, with the same configurations as for the source cell group;

4> establish the logical channel for the target cell group, with the same configurations as for the source cell group;

3> suspend SRBs for the source cell group;

NOTE 3: Void

3> apply the value of the *newUE-Identity* as the C-RNTI in the target cell group;

3> configure lower layers for the target SpCell in accordance with the received s*pCellConfigCommon*;

3> configure lower layers for the target SpCell in accordance with any additional fields, not covered in the previous, if included in the received *reconfigurationWithSync.*

2> else:

3> reset the MAC entity of this cell group;

3> consider the SCell(s) of this cell group, if configured, that are not included in the *SCellToAddModList* in the *RRCReconfiguration* message, to be in deactivated state;

3> apply the value of the *newUE-Identity* as the C-RNTI for this cell group;

3> configure lower layers in accordance with the received s*pCellConfigCommon*;

3> if *rach-LessHO* is included:

4> configure lower layers in accordance with *rach-LessHO* for the target SpCell;

3> configure lower layers in accordance with any additional fields, not covered in the previous, if included in the received *reconfigurationWithSync.*

2> if the UE is acting as L2 U2N Remote UE at the source side:

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

4> indicate upper layer to trigger PC5 unicast link release.

Upon L2 U2N Relay UE receiving *reconfigurationWithSync*, it either indicates to upper layers (to trigger PC5 unicast link release with its child UE(s)) or sends *NotificationMessageSidelink* message to the connected L2 U2N Remote UE(s) or to the child UE(s) in accordance with 5.8.9.10.

NOTE 4: The MP direct path release is realized by direct-to-indirect path switch procedure (i.e. *sl-PathSwitchConfig* and *sl-indirectPathMaintain* included in *RRCReconfiguration* message), where MP is configured in source side.

================================NEXT CHANGE======================================

##### 5.3.5.5.12 Uu Relay RLC channel release

The L2 U2N Relay UE [RIL]: O502, SLRelay or L2 Last U2N Relay UE or N3C relay UE shall:

1> for each *Uu-RelayRLC-ChannelID* value included in the *uu-RelayRLC-ChannelToReleaseList* that is part of the current configuration within the same cell group (LCH release):

2> release the RLC entity as specified in TS 38.322 [4], clause 5.1.3;

2> release the corresponding logical channel.

##### 5.3.5.5.13 Uu Relay RLC channel addition/modification

For each *Uu-RelayRLC-ChannelConfig* received in the *uu-RelayRLC-ChannelToAddModList* the L2 U2N Relay UE [RIL]: O502, SLRelay or L2 Last U2N Relay UE or N3C relay UE shall:

1> if the current configuration contains a Uu Relay RLC channel with the same *uu-RelayRLC-ChannelID* within the same cell group:

2> if *reestablishRLC* is received:

3> re-establish the RLC entity as specified in TS 38.322 [4];

2> reconfigure the RLC entity in accordance with the received *rlc-Config*;

2> reconfigure the logical channel in accordance with the received *mac-LogicalChannelConfig*;

1> else (a logical channel with the given *uu-RelayRLC-ChannelID* was not configured before within the same cell group):

2> establish an RLC entity in accordance with the received *rlc-Config*;

2> configure this MAC entity with a logical channel in accordance to the received *mac-LogicalChannelConfig*.

=================================NEXT CHANGE=======================================

#### 5.3.5.15 L2 U2N or U2U Relay UE configuration

##### 5.3.5.15.1 General

The network configures the L2 U2N or U2U Relay UE with relay operation related configurations. For each connected L2 U2N or U2U Remote UE indicated in *sl-L2IdentityRemote*, the network provides the configuration parameters used for relaying.

The L2 U2N Relay UE shall:

1> if *sl-L2RelayUE-Config* is set to *setup*:

2> if the *sl-L2RelayUE-Config* contains the *sl-RemoteUE-ToReleaseList*:

3> perform the L2 U2N Remote UE release as specified in 5.3.5.15.2;

2> if the *sl-L2RelayUE-Config* contains the *sl-RemoteUE-ToAddModList*:

3> perform the L2 U2N Remote UE addition/modification as specified in 5.3.5.15.3;

1> else if *sl-L2RelayUE-Config* is set to *release*:

2> release the L2 U2N relay operation related configurations.

The L2 U2U Relay UE shall:

1> if *sl-L2RelayUE-Config* is set to *setup*:

2> if the *sl-L2RelayUE-Config* contains the *sl-U2U-RemoteUE-ToReleaseList*:

3> perform the L2 U2U Remote UE release as specified in 5.3.5.15.2;

2> if the *sl-L2RelayUE-Config* contains the *sl-U2U-RemoteUE-ToAddModList*:

3> perform the L2 U2U Remote UE addition/modification as specified in 5.3.5.15.3;

1> else if *sl-L2RelayUE-Config* is set to *release*:

2> release the L2 U2U relay operation related configurations.

##### 5.3.5.15.2 L2 U2N or U2U Remote UE Release

The L2 U2N Relay UE shall:

1> if the release is triggered by reception of the *sl-RemoteUE-ToReleaseList*:

2> for each *SL-DestinationIdentity* value included in the *sl-RemoteUE-ToReleaseList*:

3> if the current UE has a PC5 RRC connection to a L2 U2N Remote UE with *SL-DestinationIdentity*:

4> indicate upper layers to trigger PC5 unicast link release.

The L2 U2U Relay UE shall:

1> if the release is triggered by reception of the *sl-U2U-RemoteUE-ToReleaseList*:

2> for each *SL-DestinationIdentity* value included in the *sl-U2U-RemoteUE-ToReleaseList*:

3> if the current UE has a PC5-RRC connection to a L2 U2U Remote UE with this *SL-DestinationIdentity*:

4> release the configuration associated with the L2 U2U Remote UE.

##### 5.3.5.15.3 L2 U2N or U2U Remote UE Addition/Modification

The L2 U2N Relay UE shall:

1> if no SRAP entity has been established:

2> establish a SRAP entity as specified in TS 38.351 [66];

1> for each *sl-L2IdentityRemote* value included in the *sl-RemoteUE-ToAddModList* that is not part of the current UE configuration (L2 U2N Remote UE Addition): [RIL]: J011, SLRelay

2> configure the parameters to SRAP entity in accordance with the *sl-SRAP-ConfigRelay* and *sl-SRAP-ConfigRelayToAddModList* if applicable;

2> if SRB1 is included in *sl-MappingToAddModList*, and *sl-EgressRLC-ChannelPC5* is configured:

3> release SL-RLC1, if established;

3> associate the PC5 Relay RLC channel as indicated by *sl-EgressRLC-ChannelPC5* with SRB1;

2> else: (i.e. SRB1 is not included in *sl-MappingToAddModList*, or SRB1 is included in *sl-MappingToAddModList*, but *sl-EgressRLC-ChannelPC5* is not configured)

3> if SL-RLC1 is not established:

4> apply the default configuration of SL-RLC1 as specified in clause 9.2.4 and associate it with the SRB1;

1> for each *sl-L2IdentityRemote* value included in the *sl-RemoteUE-ToAddModList* that is part of the current UE configuration (L2 U2N Remote UE modification):

2> modify the configuration in accordance with the *sl-SRAP-ConfigRelay* and *sl-SRAP-ConfigRelayToAddModList/ sl-SRAP-ConfigRelayToReleaseList* if applicable;

The L2 U2U Relay UE shall:

1> if no SRAP entity has been established:

2> establish a SRAP entity as specified in TS 38.351 [66];

1> for each target L2 U2U Remote UE indicated in *sl-L2IdentityRemoteUE* value included in the *sl-U2U-RemoteUE-ToAddModList* that is not part of the current UE configuration (target L2 U2U Remote UE Addition):

2> for each source L2 U2U Remote UE indicated in *sl-SourceUE-Identity* in accordance with one entry of the *sl-SourceRemoteUE-ToAddModList*:

3> configure the parameters to SRAP entity in accordance with the *sl-SRAP-ConfigU2U*;

1> for each target L2 U2U Remote UE indicated in *sl-L2IdentityRemote* value included in the *sl-U2U-RemoteUE-ToAddModList* that is part of the current UE configuration (target L2 U2U Remote UE modification):

2> for each source L2 U2U Remote UE indicated in *sl-SourceUE-Identity* included in the *sl-SourceRemoteUE-ToReleaseList* (source L2 U2U Remote UE Release):

3> release the configuration associated with the source L2 U2U Remote UE;

2> for the source L2 U2U Remote UE indicated in *sl-SourceUE-Identity* included in the *sl-SourceRemoteUE-ToAddModList* that is not part of the current UE configuration (source L2 U2U Remote UE Addition):

3> configure the parameters to SRAP entity in accordance with the *sl-SRAP-ConfigU2U*;

2> for the source L2 U2U Remote UE indicated in *sl-SourceUE-Identity* included in the *sl-SourceRemoteUE-ToAddModList* that is part of the current UE configuration (source L2 U2U Remote UE modification):

3> modify the configuration in accordance with the *sl-SRAP-ConfigU2U*;

#### 5.3.5.16 L2 U2N or U2U Remote UE configuration

The network configures the L2 U2N or U2U Remote UE with relay operation related configurations, e.g. SRAP configuration.

The L2 U2N Remote UE shall:

1> if *sl-L2RemoteUE-Config* is set to *setup* or received from *RRCSetup* message:

2> if the *sl-L2RemoteUE-Config* contains the *sl-SRAP-ConfigRemote*:

3> if no SRAP entity has been established:

4> establish a SRAP entity as specified in TS 38.351 [66];

3> configure the parameters to SRAP entity in accordance with the *sl-SRAP-ConfigRemote*;

3> if SRB1 is included in *sl-MappingToAddModList*, and *sl-EgressRLC-ChannelPC5* is configured:

4> release SL-RLC1, if established;

4> associate the PC5 Relay RLC channel as indicated by *sl-EgressRLC-ChannelPC5* with SRB1;

3> else: (i.e. SRB1 is not included in *sl-MappingToAddModList*, or SRB1 is included in *sl-MappingToAddModList*, but *sl-EgressRLC-ChannelPC5* is not configured)

4> if SL-RLC1 is not established:

5> apply the default configuration of SL-RLC1 as specified in clause 9.2.4 and associate it with the SRB1;

2> if the *sl-L2RemoteUE-Config* contains the *sl-UEIdentityRemote*:

3> use the value of the *sl-UEIdentityRemote* as the C-RNTI in the PCell.

1> else if *sl-L2RemoteUE-Config* is set to *release*:

2> release the L2 U2N relay operation related configurations.

The L2 U2U Remote UE shall:

1> if *sl-L2RemoteUE-Config* is set to setup:

2> if the *sl-L2RemoteUE-Config* contains the *sl-U2U-RelayUE-ToReleaseList*:

3> perform the L2 U2U Relay UE release as specified in 5.3.5.16.1;

2> if the *sl-L2RemoteUE-Config* contains the *sl-U2U-RelayUE-ToAddModList*:

3> perform the L2 U2U Relay UE addition/modification as specified in 5.3.5.16.2;

1> else if *sl-L2RemoteUE-Config* is set to release:

2> release the L2 U2U relay operation related configurations.

##### 5.3.5.16.1 L2 U2U Relay UE Release

The L2 U2U Remote UE shall:

1> if the release is triggered by reception of the *sl-U2U-RelayUE-ToReleaseList*:

2> for each SL-DestinationIdentity value included in the *sl-U2U-RelayUE-ToReleaseList*:

3> release the configuration associated with the L2 U2U Relay UE.

##### 5.3.5.16.2 L2 U2U Relay UE Addition/Modification

The L2 U2U Remote UE shall:

1> if no SRAP entity has been established:

2> establish a SRAP entity as specified in TS 38.351 [66];

1> for each L2 U2U Relay UE indicated in *sl-L2IdentityRelay* value included in the *sl-U2U-RelayUE-ToAddModList* that is not part of the current UE configuration (L2 U2U Relay UE Addition):

2> for target L2 U2U Remote UE indicated in *sl-TargetUE-Identity* in accordance with one entry of the *SL-PeerRemoteUE-ToAddModList*:

3> configure the parameters to SRAP entity in accordance with the *sl-SRAP-ConfigU2U*;

1> for each L2 U2U Relay UE indicated in *sl-L2IdentityRelay* value included in the *sl-U2U-RelayUE-ToAddModList* that is part of the current UE configuration (L2 U2U Relay UE modification):

2> for each *SL-DestinationIdentity* valueincluded in the *sl-TargetRemoteUE-ToReleaseList* (target L2 U2U Remote UE Release):

3> release the configuration associated with the peer target L2 U2U Remote UE;

2> for the target L2 U2U Remote UE indicated in *sl-TargetUE-Identity* included in the *sl-TargetRemoteUE-ToAddModList* that is not part of the current UE configuration (target L2 U2U Remote UE Addition):

3> configure the parameters to SRAP entity in accordance with the *sl-SRAP-ConfigU2U*;

2> for the target L2 U2U Remote UE indicated in *sl-TargetUE-Identity* included in the *sl-TargetRemoteUE-ToAddModList* that is part of the current UE configuration (target L2 U2U Remote UE modification):

3> modify the configuration in accordance with the *sl-SRAP-ConfigU2U*;

=================================NEXT CHANGE=======================================

### 5.3.7 RRC connection re-establishment

#### 5.3.7.1 General



Figure 5.3.7.1-1: RRC connection re-establishment, successful



Figure 5.3.7.1-2: RRC re-establishment, fallback to RRC establishment, successful

The purpose of this procedure is to re-establish the RRC connection. A UE in RRC\_CONNECTED, for which AS security has been activated with SRB2 and at least one DRB/multicast MRB setup or, for IAB and NCR, SRB2, may initiate the procedure in order to continue the RRC connection. The connection re-establishment succeeds if the network is able to find and verify a valid UE context or, if the UE context cannot be retrieved, and the network responds with an *RRCSetup* according to clause 5.3.3.4.

The network applies the procedure e.g as follows:

- When AS security has been activated and the network retrieves or verifies the UE context:

- to re-activate AS security without changing algorithms;

- to re-establish and resume the SRB1;

- When UE is re-establishing an RRC connection, and the network is not able to retrieve or verify the UE context:

- to discard the stored AS Context and release all RBs and BH RLC channels and Uu Relay RLC channels;

- to fallback to establish a new RRC connection.

If AS security has not been activated, the UE shall not initiate the procedure but instead moves to RRC\_IDLE directly, with release cause 'other'. If AS security has been activated, but SRB2 and at least one DRB or multicast MRB or, for IAB and NCR, SRB2, are not setup, the UE does not initiate the procedure but instead moves to RRC\_IDLE directly, with release cause 'RRC connection failure'.

#### 5.3.7.2 Initiation

The UE initiates the procedure when one of the following conditions is met:

1> upon detecting radio link failure of the MCG and *t316* is not configured, in accordance with 5.3.10; or

1> upon detecting radio link failure of the MCG while SCG transmission is suspended, in accordance with 5.3.10; or

1> upon detecting radio link failure of the MCG while PSCell change or PSCell addition is ongoing, in accordance with 5.3.10; or

1> upon detecting radio link failure of the MCG while the SCG is deactivated, in accordance with 5.3.10; or

1> upon re-configuration with sync failure of the MCG, in accordance with clause 5.3.5.8.3; or

1> upon mobility from NR failure, in accordance with clause 5.4.3.5; or

1> upon integrity check failure indication from lower layers concerning SRB1 or SRB2, except if the integrity check failure is detected on the *RRCReestablishment* message; or

1> upon an RRC connection reconfiguration failure, in accordance with clause 5.3.5.8.2; or

1> upon detecting radio link failure for the SCG while MCG transmission is suspended, in accordance with clause 5.3.10.3 in NR-DC or in accordance with TS 36.331 [10] clause 5.3.11.3 in NE-DC; or

1> upon reconfiguration with sync failure of the SCG while MCG transmission is suspended in accordance with clause 5.3.5.8.3; or

1> upon SCG change failure while MCG transmission is suspended in accordance with TS 36.331 [10] clause 5.3.5.7a; or

1> upon SCG configuration failure while MCG transmission is suspended in accordance with clause 5.3.5.8.2 in NR-DC or in accordance with TS 36.331 [10] clause 5.3.5.5 in NE-DC; or

1> upon integrity check failure indication from SCG lower layers concerning SRB3 while MCG is suspended; or

1> upon T316 expiry, in accordance with clause 5.7.3b.5; or

1> upon detecting sidelink radio link failure by L2 U2N Remote UE in RRC\_CONNECTED which is not configured with MP, in accordance with clause 5.8.9.3; or

1> upon reception of *NotificationMessageSidelink* including *indicationType* by L2 U2N Remote UE in RRC\_CONNECTED which is not configured with MP or by L2 Intermediate U2N Relay UE in RRC\_CONNECTED, in accordance with clause 5.8.9.10; or

1> upon PC5 unicast link release for the serving L2 U2N Relay UE indicated by upper layer at L2 U2N Remote UE in RRC\_CONNECTED which is not configured with MP while T301 is not running; or

1> if MP is configured, upon detecting radio link failure of the MCG (i.e. direct path) in accordance with clause 5.3.10 while the transmission of indirect path is suspended as specified in 5.3.5.17; or

1> if MP is configured, upon detecting radio link failure of the MCG (i.e. direct path) in accordance with 5.3.10 while MP indirect path addition or change is ongoing; or

1> if MP is configured, upon detecting sidelink radio link failure of SL indirect path by L2 U2N Remote UE, in accordance with clause 5.8.9.3, while MCG transmission (i.e. direct path) is suspended as specified in clause 5.7.3b; or

1> if MP is configured, upon reception of *NotificationMessageSidelink* including *indicationType* in accordance with clause 5.8.9.10, while MCG transmission (i.e. direct path) is suspended as specified in clause 5.7.3b; or

1> if MP is configured, upon PC5 unicast link release indicated by upper layer at L2 U2N Remote UE, while MCG transmission (i.e. direct path) is suspended as specified in clause 5.7.3b; or

1> if MP is configured, upon detecting the failure of N3C indirect path by N3C remote UE in accordance with clause 5.7.3c, while MCG transmission (i.e. direct path) is suspended.

NOTE 0: It is up to UE implementation whether to initiate the procedure while T346g is running.

Upon initiation of the procedure, the UE shall:

1> stop timer T310, if running;

1> stop timer T312, if running;

1> stop timer T304, if running;

1> start timer T311;

1> stop timer T316, if running;

1> stop timer T421, if running;

1> if UE is not configured with *attemptCondReconfig*;and

1> if UE is not configured with *attemptLTM-Switch*:

2> reset MAC;

2> release *spCellConfig*, if configured;

2> suspend all RBs, and BH RLC channels for IAB-MT, and Uu Relay RLC channels for L2 U2N Relay UE or for L2 Last U2N Relay UE, except SRB0 and broadcast MRBs;

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

2> if MR-DC is configured:

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

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

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

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

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

2> release *btNameList*, if configured;

2> release *wlanNameList*, if configured;

2> release *sensorNameList*, if configured;

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

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

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

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

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

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

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

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

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

2> release *referenceTimePreferenceReporting*, if configured;

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

2> release *obtainCommonLocation*, if configured;

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

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

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

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

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

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

2> release *propDelayDiffReportConfig*, if configured;

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

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

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

2> release *minSchedulingOffsetPreferenceConfigExt*, if configured;

2> release *multiRx-PreferenceReportingConfigFR2*, if configured, and stop timer T346m, if running;

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

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

1> release *successHO-Config*, if configured;

1> release *successPSCell-Config* configured by the PCell, if configured;

1> if any DAPS bearer is configured:

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> release *sl-L2RelayUE-Config* for L2 U2N relay operation, if configured;

1> release *sl-L2RemoteUE-Config* for L2 U2N relay operation, if configured;

1> release the SRAP entity for L2 U2N relay operation, if configured;

1> release *ncr-FwdConfig*, if configured;

1> if the UE is NCR-MT:

2> indicate to NCR-Fwd to cease forwarding;

1> if SL indirect path is configured:

2> release cell identity and relay UE ID configured in *sl-IndirectPathAddChange*;

2> indicate upper layers to trigger PC5 unicast link release of the SL indirect path;

1> if N3C indirect path is configured:

2> release *n3c-IndirectPathAddChange*;

2> consider the non-3GPP connection is not used;

1> if the UE is acting as a N3C relay UE:

2> release *n3c-IndirectPathConfigRelay*;

2> consider the non-3GPP connection is not used;

1> if the UE is acting as L2 U2N Remote UE and MP via L2 U2N Relay UE is not configured or is acting as L2 Intermediate U2N Relay UE:

2> if the PC5-RRC connection with the U2N Relay UE is determined to be released:

3> indicate upper layers to trigger PC5 unicast link release;

3> perform either cell selection in accordance with the cell selection process as specified in TS 38.304 [20], or relay selection as specified in clause 5.8.15.3, or both;

2> else (i.e., maintain the PC5 RRC connection):

3> consider the connected L2 U2N Relay UE as suitable and perform actions as specified in clause 5.3.7.3a;

NOTE 1: It is up to Remote UE implementation whether to release or keep the current PC5 unicast link.

1> else:

2> if the UE is capable of L2 U2N Remote UE or L2 Intermediate U2N Relay UE:

3> perform either cell selection as specified in TS 38.304 [20], or relay selection as specified in clause 5.8.15.3, or both;

2> else:

3> perform cell selection in accordance with the cell selection process as specified in TS 38.304 [20].

NOTE 2: For L2 U2N Remote UE or L2 Intermediate U2N Relay UE, if both a suitable cell and a suitable relay are available, the UE can select either one based on its implementation.

#### 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> 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) or child 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'.

#### 5.3.7.3a Actions following relay selection while T311 is running

Upon selecting a suitable L2 U2N Relay UE, the L2 U2N Remote UE shall:

1> indicate to upper layer to trigger the PC5 unicast link establishment with the selected L2 U2N Relay UE, if a new L2 U2N Relay UE is selected;

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 cell selection procedure, if ongoing;

1> start timer T301;

1> release the RLC entity for SRB0, if any;

1> establish a SRAP entity as specified in TS 38.351 [66], if no SRAP entity has been established;

1> apply the specified configuration of SL-RLC0 as specified in 9.1.1.4;

1> apply the SDAP configuration and PDCP configuration as specified in 9.1.1.2 for SRB0;

1> initiate transmission of the *RRCReestablishmentRequest* message in accordance with 5.3.7.4.

=================================NEXT CHANGE=======================================

### 5.3.10 Radio link failure related actions

#### 5.3.10.1 Detection of physical layer problems in RRC\_CONNECTED

The UE shall:

1> if any DAPS bearer is configured, upon receiving N310 consecutive "out-of-sync" indications for the source SpCell from lower layers and T304 is running:

2> start timer T310 for the source SpCell.

1> upon receiving N310 consecutive "out-of-sync" indications for the SpCell from lower layers while neither T300, T301, T304, T311, T316 nor T319 are running:

2> start timer T310 for the corresponding SpCell.

#### 5.3.10.2 Recovery of physical layer problems

Upon receiving N311 consecutive "in-sync" indications for the SpCell from lower layers while T310 is running, the UE shall:

1> stop timer T310 for the corresponding SpCell.

1> stop timer T312 for the corresponding SpCell, if running.

NOTE 1: In this case, the UE maintains the RRC connection without explicit signalling, i.e. the UE maintains the entire radio resource configuration.

NOTE 2: Periods in time where neither "in-sync" nor "out-of-sync" is reported by L1 do not affect the evaluation of the number of consecutive "in-sync" or "out-of-sync" indications.

#### 5.3.10.3 Detection of radio link failure

The UE shall:

1> if any DAPS bearer is configured and T304 is running:

2> upon T310 expiry in source SpCell; or

2> upon random access problem indication from source MCG MAC; or

2> upon indication from source MCG RLC that the maximum number of retransmissions has been reached; or

2> upon consistent uplink LBT failure indication from source MCG MAC:

3> consider radio link failure to be detected for the source MCG i.e. source RLF;

3> suspend the transmission and reception of all DRBs and multicast MRBs in the source MCG;

3> reset MAC for the source MCG;

3> release the source connection.

1> else:

2> during a DAPS handover: the following only applies for the target PCell;

2> upon T310 expiry in PCell; or

2> upon T312 expiry in PCell; or

2> upon random access problem indication from MCG MAC while neither T300, T301, T304, T311 nor T319 are running and SDT procedure is not ongoing; or

2> upon indication from MCG RLC that the maximum number of retransmissions has been reached while SDT procedure is not ongoing; or

2> if connected as an IAB-node, upon BH RLF indication received on BAP entity from the MCG; or

2> upon consistent uplink LBT failure indication from MCG MAC while T304 is not running:

3> if the indication is from MCG RLC and CA duplication is configured and activated for MCG, and for the corresponding logical channel *allowedServingCells* only includes SCell(s):

4> initiate the failure information procedure as specified in 5.7.5 to report RLC failure.

3> else:

4> consider radio link failure to be detected for the MCG, i.e. MCG RLF;

4> discard any segments of segmented RRC messages stored according to 5.7.6.3;

NOTE 1: Void.

4> if AS security has not been activated:

5> perform the actions upon going to RRC\_IDLE as specified in 5.3.11, with release cause 'other';-

4> else if AS security has been activated but SRB2 and at least one DRB or multicast MRB or, for IAB and NCR, SRB2, have not been setup:

5> store the radio link failure information in the *VarRLF-Report* as described in clause 5.3.10.5;

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

4> else:

5> store the radio link failure information in the *VarRLF-Report* as described in clause 5.3.10.5;

5> if MP is configured:

6> if T316 is configured, and MP indirect path transmission is not suspended; and

6> if neither MP indirect path change nor MP indirect path addition is ongoing:

7> initiate the MCG failure information procedure as specified in 5.7.3b to report MCG radio link failure.

6> else:

7> initiate the connection re-establishment procedure as specified in 5.3.7.

5> else:

6> if the UE supports RLF-Report for fast MCG recovery procedure and if T316 is configured:

7> if the SCG is deactivated at the moment of detecting RLF in the MCG:

8> set the *mcg-RecoveryFailureCause* in the *VarRLF-Report* to *scg-Deactivated*;

8> set the *pSCellId* in the *VarRLF-Report* to the global cell identity of the PSCell, if available, otherwise to the physical cell identity and carrier frequency of the PSCell;

7> else if SCG transmission is suspended at the moment of detecting RLF in the MCG:

8> set the *pSCellId* in the *VarRLF-Report* to the global cell identity of the PSCell, if available, otherwise to the physical cell identity and carrier frequency of the PSCell;

8> set the *scg-FailureCause* value in the *VarRLF-Report* according to 5.7.3.5;

8> set the *elapsedTimeSCG-Failure* in the *VarRLF-Report* to the time elapsed between SCG failure and the MCG failure;

6> if T316 is configured; and

6> if SCG transmission is not suspended; and

6> if the SCG is not deactivated; and

6> if neither PSCell change nor PSCell addition is ongoing (i.e. timer T304 for the NR PSCell is not running in case of NR-DC or timer T307 of the E-UTRA PSCell is not running as specified in TS 36.331 [10], clause 5.3.10.10, in NE-DC):

7> initiate the MCG failure information procedure as specified in 5.7.3b to report MCG radio link failure.

6> else:

7> initiate the connection re-establishment procedure as specified in 5.3.7.

A L2/L3 U2N Relay UE in case of single hop or the L2 Last U2N Relay UE shall:

1> upon detecting radio link failure:

2> either indicate to upper layers (to trigger PC5 unicast link release with its child UE(s)) or send *NotificationMessageSidelink* to the connected L2/L3 U2N Remote UE(s) or to the child UE(s)) in accordance with 5.8.9.10.

A N3C Relay UE shall:

1> upon detecting radio link failure:

2> indicates to the associated N3C remote UE via the Non-3GPP Connection.

NOTE 2: How the N3C Relay UE indicates Uu RLF on the Non-3GPP Connection is left to implementation.

The UE shall:

1> upon T310 expiry in PSCell; or

1> upon T312 expiry in PSCell; or

1> upon random access problem indication from SCG MAC; or

1> upon indication from SCG RLC that the maximum number of retransmissions has been reached; or

1> if connected as an IAB-node, upon BH RLF indication received on BAP entity from the SCG; or

1> upon consistent uplink LBT failure indication from SCG MAC:

2> if the indication is from SCG RLC and CA duplication is configured and activated for SCG, and for the corresponding logical channel *allowedServingCells* only includes SCell(s):

3> initiate the failure information procedure as specified in 5.7.5 to report RLC failure.

2> else:

3> consider radio link failure to be detected for the SCG, i.e. SCG RLF;

3> if the SCG is deactivated:

4> stop radio link monitoring on the SCG;

4> indicate to lower layers to stop beam failure detection on the PSCell;

3> if MCG transmission is not suspended:

4> initiate the SCG failure information procedure as specified in 5.7.3 to report SCG radio link failure.

3> else:

4> if the UE is in NR-DC:

5> if the UE supports RLF-Report for fast MCG recovery procedure and if the UE detected SCG failure while the timer T316 was running:

6> set the *pSCellId* in the *VarRLF-Report* to the global cell identity of the PSCell, if available, otherwise to the physical cell identity and carrier frequency of the PSCell;

6> set the *scg-FailureCause* in the *VarRLF-Report* value according to 5.7.3.5;

6> set the *elapsedTimeSCG-Failure* in the *VarRLF-Report* to the time elapsed between MCG failure and the SCG failure;

6> include *scg-FailedAfterMCG*;

5> initiate the connection re-establishment procedure as specified in 5.3.7;

4> else (the UE is in (NG)EN-DC):

5> initiate the connection re-establishment procedure as specified in TS 36.331 [10], clause 5.3.7;

=================================NEXT CHANGE=======================================

### 5.3.13 RRC connection resume

#### 5.3.13.1 General



Figure 5.3.13.1-1: RRC connection resume, successful



Figure 5.3.13.1-2: RRC connection resume fallback to RRC connection establishment, successful



Figure 5.3.13.1-3: RRC connection resume followed by network release, successful



Figure 5.3.13.1-4: RRC connection resume followed by network suspend, successful



Figure 5.3.13.1-5: RRC connection resume, network reject

The purpose of this procedure is to resume a suspended RRC connection, including resuming SRB(s), DRB(s) and multicast MRB(s) or perform an RNA update. This procedure is also used to initiate SDT in RRC\_INACTIVE.

#### 5.3.13.1a Conditions for resuming RRC Connection for NR sidelink communication/positioning/discovery/V2X sidelink communication

For NR sidelink communication/positioning/discovery an RRC connection is resumed only in the following cases:

1> if configured by upper layers to transmit NR sidelink communication and related data is available for transmission:

2> if the frequency on which the UE is configured to transmit NR sidelink communication is included in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* within *SIB12* provided by the cell on which the UE camps; and if the valid version of *SIB12* does not include *sl-TxPoolSelectedNormal* for the concerned frequency;

1> if configured by upper layers to transmit NR sidelink discovery and related data is available for transmission:

2> if the UE is configured by upper layers to transmit NR sidelink L2 U2U relay discovery messages and *sl-L2-U2U-Relay-r18* is included in *SIB12*; or

2> if the UE is configured by upper layers to transmit NR sidelink L3 U2U relay discovery messages and *sl-L3-U2U-RelayDiscovery* is included in *SIB12*; or

2> if the UE is configured by upper layers to transmit NR sidelink L2 U2N[RIL]: Z451, SLRelay relay discovery messages and *sl-L2U2N-Relay* is included in *SIB12*; or

[RIL]: Z452, SLRelay2> if the UE is configured by upper layers to transmit NR sidelink L3 U2N relay discovery messages and *sl-L3U2N-RelayDiscovery* is included in *SIB12*; or

2> if the UE is configured by upper layers to transmit NR sidelink non-relay discovery messages and *sl-NonRelayDiscovery* is included in *SIB12*:

3> if the frequency on which the UE is configured to transmit NR sidelink discovery is included in *sl-FreqInfoList* within *SIB12* provided by the cell on which the UE camps; and if the valid version of *SIB12* does not include *sl-DiscTxPoolSelected* or *sl-TxPoolSelectedNormal* for the concerned frequency;

1> if configured by upper layers to perform NR sidelink positioning and indicated by upper layers to transmit SL-PRS:

2> if the frequency on which the UE is configured to transmit SL-PRS is included in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* within *SIB12* provided by the cell on which the UE camps; and if the valid version of *SIB12* does not include *sl-PRS-ResourcesSharedSL-PRS-RP-r18* in *sl-TxPoolSelectedNormal* for the concerned frequency; or

2> if the frequency on which the UE is configured to transmit SL-PRS is included in *sl-PosFreqInfoList* within *SIB23* provided by the cell on which the UE camps; and if the valid version of *SIB23* does not include *sl-PRS-TxPoolSelectedNormal* for the concerned frequency;

For L2 U2N Relay UE in RRC\_INACTIVE, an RRC connection establishment is resumed in the following cases:

1> if any message is received from the L2 U2N Remote UE or from a child UE via SL-RLC0 as specified in 9.1.1.4 or SL-RLC1 as specified in 9.2.4; or

1> if *RemoteUEInformationSidelink* containing the *connectionForMP* is received from a L2 U2N Remote UE as specified in 5.8.9.8.3;

For V2X sidelink communication an RRC connection resume is initiated only when the conditions specified for V2X sidelink communication in clause 5.3.3.1a of TS 36.331 [10] are met.

NOTE: Upper layers initiate an RRC connection resume (except if the RRC connection resume is initiated at the L2 U2N Relay UE upon reception of a message from a L2 U2N Remote UE via SL-RLC0 or SL-RLC1, or upon reception of *RemoteUEInformationSidelink* message containing the *connectionForMP*). The interaction with NAS is left to UE implementation.

#### 5.3.13.1b Conditions for initiating SDT

When requesting lower layers to check the conditions for initiating SDT, RRC indicates to lower layers whether the resume procedure is initiated for mobile originated or mobile terminated case.

A UE in RRC\_INACTIVE initiates the resume procedure for SDT when all of the following conditions are fulfilled:

1> for the resume procedure initiated by the upper layers (i.e. mobile originated case):

2> SIB1 includes sdt-ConfigCommon; and

2> *sdt-Config* is configured; and

2> all the pending data in UL is mapped to the radio bearers configured for SDT; and

2> for an (e)RedCap UE when RedCap-specific initial downlink BWP includes no CD-SSB, *ncd-SSB-RedCapInitialBWP-SDT* is configured; and

2> lower layers indicate that conditions for initiating MO-SDT as specified in TS 38.321 [3] are fulfilled.

1> for the resume procedure initiated in response to RAN paging (i.e. mobile terminated case):

2> lower layers indicate that conditions for initiating MT-SDT as specified in TS 38.321 [3] are fulfilled.

NOTE: How the UE determines that all pending data in UL is mapped to radio bearers configured for SDT is left to UE implementation.

#### 5.3.13.1c Void

#### 5.3.13.1d Conditions for resuming RRC connection for multicast reception

In RRC\_INACTIVE state, if configured with MBS multicast reception in RRC\_INACTIVE, the UE shall:

1> if the RRC connection resume procedure is triggered for multicast reception at reception of *SIB1*, as specified in 5.2.2.4.2; or

1> if the RRC connection resume procedure is triggered for multicast reception at reception of *Paging* message, as specified in 5.3.2.3; or

1> if the PTM configuration is not available on the multicast MCCH in the new cell after cell selection (i.e., different from the cell where the UE was configured to receive multicast in RRC\_CONNECTED) or in the cell after cell reselection for at least one multicast session that the UE has joined and for which the UE is not indicated to stop monitoring the G-RNTI; or

1> if *mbs-NeighbourCellList* included in *MBSMulticastConfiguration* acquired in the previous cell indicates that at least one multicast session that the UE has joined and for which the UE is not indicated to stop monitoring the G-RNTI, is not provided for RRC\_INACTIVE in the current serving cell; or

1> if either the measured RSRP or RSRQ for serving cell as specified in TS 38.304 [20] is below the corresponding threshold indicated by *thresholdIndex* for a multicast session that the UE has joined and for which the UE is not indicated to stop monitoring the G-RNTI:

2> initiate RRC connection resume procedure as specified in 5.3.13.2 with *resumeCause* set as below:

3> if the UE is configured by upper layers with Access Identity 1:

4> set *resumeCause* to *mps-PriorityAccess*;

3> else if the UE is configured by upper layers with Access Identity 2:

4> set *resumeCause* to *mcs-PriorityAccess*;

3> else if the UE is configured by upper layers with one or more Access Identities equal to 11-15:

4> set *resumeCause* to *highPriorityAccess*;

3> else:

4> set *resumeCause* to *mt-Access*.

#### 5.3.13.2 Initiation

The UE initiates the procedure when upper layers or AS (when responding to RAN paging, upon triggering RNA updates while the UE is in RRC\_INACTIVE, upon requesting multicast reception as specified in clause 5.3.13.1d, for NR sidelink communication/discovery/V2X sidelink communication as specified in clause 5.3.13.1a, for requesting configuration for SRS for positioning, for activation of preconfigured Positioning SRS in RRC\_INACTIVE, for activation of non-preconfigured Positioning SRS with type semi-persistent in RRC\_INACTIVE, upon receiving *RRCRelease* message including *resumeIndication*) requests the resume of a suspended RRC connection or requests the resume for initiating SDT as specified in clause 5.3.13.1b.

The UE shall ensure having valid and up to date essential system information as specified in clause 5.2.2.2 before initiating this procedure.

Upon initiation of the procedure, the UE shall:

1> if the resumption of the RRC connection is triggered by response to NG-RAN paging; or

1> if the resumption of the RRC connection is triggered by receiving *RRCRelease* message including *resumeIndication*; or

1> if the resumption of the RRC connection is triggered for multicast reception as specified in clause 5.3.13.1d:

2> select '0' as the Access Category;

2> perform the unified access control procedure as specified in 5.3.14 using the selected Access Category and one or more Access Identities provided by upper layers;

3> if the access attempt is barred, the procedure ends;

1> else if the resumption of the RRC connection is triggered by upper layers:

2> if the upper layers provide an Access Category and one or more Access Identities:

3> perform the unified access control procedure as specified in 5.3.14 using the Access Category and Access Identities provided by upper layers;

4> if the access attempt is barred, the procedure ends;

2> if the upper layers provide NSAG information and one or more S-NSSAI(s) triggering the access attempt (TS 23.501 [32] and TS 24.501 [23]):

3> apply the NSAG with highest NSAG priority among the NSAGs that are included in *SIB1* (i.e., in *FeatureCombination* and/or in *RA-PrioritizationSliceInfo*), and that are associated with the S-NSSAI(s) triggering the access attempt, in the Random Access procedure (TS 38.321 [3], clause 5.1);

NOTE 0: If there are multiple NSAGs with the same highest NAS-provided NSAG priority identified for access attempt as above, it is left to UE implementation to select the NSAG to be applied in the Random Access procedure.

2> if the resumption occurs after release with redirect with *mpsPriorityIndication*:

3> set the *resumeCause* to *mps-PriorityAccess*;

2> else if the resumption of the RRC connection is triggered for activation of preconfigured SRS for positioning available in *srs-PosRRC-InactiveValidityAreaPreConfigList* and if the UE is camped in one of the cells indicated in one of *srs-PosConfigValidityArea*; or

2> if the resumption of the RRC connection is triggered due to the need for SRS for positioning configuration and no stored *srs-PosRRC-InactiveValidityAreaPreConfigList* for the camped cell exists; or

2> if the resumption of the RRC connection is triggered due to activation of non-preconfigured SRS for positioning with type semi-persistent available in *srs-PosRRC-InactiveValidityAreaNonPreConfig* and if the UE is camped in the cells indicated in *srs-PosConfigValidityArea*:

3> if an emergency service is ongoing:

4> select '2' as the Access Category;

4> set the *resumeCause* to *emergency*;

3> else:

4> set the *resumeCause* to *srs-PosConfigOrActivationReq*;

2> else:

3> set the *resumeCause* in accordance with the information received from upper layers;

1> else if the resumption of the RRC connection is triggered due to an RNA update as specified in 5.3.13.8:

2> if an emergency service is ongoing:

NOTE 1: How the RRC layer in the UE is aware of an ongoing emergency service is up to UE implementation.

3> select '2' as the Access Category;

3> set the *resumeCause* to *emergency*;

2> else:

3> select '8' as the Access Category;

2> perform the unified access control procedure as specified in 5.3.14 using the selected Access Category and one or more Access Identities to be applied as specified in TS 24.501 [23];

3> if the access attempt is barred:

4> set the variable *pendingRNA-Update* to *true*;

4> the procedure ends;

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

2> if the resumption of the RRC connection is triggered due to cell reselection as specified in clause 5.3.13.6:

3> if an emergency service is ongoing:

4> select '2' as the Access Category;

4> set the *resumeCause* to *emergency*;

3> else:

4> select '8' as the Access Category;

4> set the *resumeCause* to *srs-PosConfigOrActivationReq*;

NOTE 2: In case the L2 U2N Relay UE initiates RRC connection resume triggered either by reception of message from a L2 U2N Remote UE or from a child UE via SL-RLC0 or SL-RLC1 as specified in 5.3.13.1a, or by reception of the *RemoteUEInformationSidelink* message containing the *connectionForMP* as specified in 5.3.13.1a, the L2 U2N Relay UE sets the *resumeCause* by implementation, but it can only set the *emergency*, *mps-PriorityAccess*, or *mcs-PriorityAccess* as *resumeCause*, if the same cause value in the message received from the L2 U2N Remote UE or from a child UE via SL-RLC0.

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

2> if the UE does not support maintaining SCG configuration upon connection resumption:

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

1> if the UE does not support maintaining the MCG SCell configurations upon connection resumption:

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

1> if the UE is acting as L2 U2N Remote UE or is acting as L2 Intermediate U2N Relay UE:

2> establish a SRAP entity as specified in TS 38.351 [66], if no SRAP entity has been established;

2> apply the default configuration of SL-RLC1 as defined in 9.2.4 for SRB1;

2> apply the default PDCP configuration as defined in 9.2.1 for SRB1;

2> apply the default configuration of SRAP as defined in 9.2.5 for SRB1;

1> else:

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 SRB1 configuration as specified in 9.2.1;

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

1> release *delayBudgetReportingConfig* from the UE Inactive AS context, if stored;

1> stop timer T342, if running;

1> release *overheatingAssistanceConfig* from the UE Inactive AS context, if stored;

1> stop timer T345, if running;

1> release *idc-AssistanceConfig* from the UE Inactive AS context, if stored;

1> release *drx-PreferenceConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346a, if running;

1> release *maxBW-PreferenceConfig* and *maxBW-PreferenceConfigFR2-2* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346b, if running;

1> release *maxCC-PreferenceConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346c, if running;

1> release *maxMIMO-LayerPreferenceConfig* and *maxMIMO-LayerPreferenceConfigFR2-2* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346d, if running;

1> release *minSchedulingOffsetPreferenceConfig* and *minSchedulingOffsetPreferenceConfigExt* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346e, if running;

1> release *rlm-RelaxationReportingConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346j, if running;

1> release *bfd-RelaxationReportingConfig* for all configured cell groups from the UE Inactive AS context, if stored;

1> stop all instances of timer T346k, if running;

1> release *releasePreferenceConfig* from the UE Inactive AS context, if stored;

1> release *wlanNameList* from the UE Inactive AS context, if stored;

1> release *btNameList* from the UE Inactive AS context, if stored;

1> release *sensorNameList* from the UE Inactive AS context, if stored;

1> release *obtainCommonLocation* from the UE Inactive AS context, if stored;

1> stop timer T346f, if running;

1> stop timer T346i, if running;

1> release *referenceTimePreferenceReporting* from the UE Inactive AS context, if stored;

1> release *sl-AssistanceConfigNR* from the UE Inactive AS context, if stored;

1> release *musim-GapAssistanceConfig* from the UE Inactive AS context, if stored and stop timer T346h, if running;

1> release *musim-GapConfig* from the UE Inactive AS context, if stored;

1> release *musim-GapPriorityAssistanceConfig* from the UE Inactive AS context, if stored;

1> release *musim-LeaveAssistanceConfig* from the UE Inactive AS context, if stored;

1> release *musim-CapabilityRestrictionConfig* from the UE Inactive AS context, if stored and stop timer T346n, if running;

1> release *propDelayDiffReportConfig* from the UE Inactive AS context, if stored;

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

1> release *rrm-MeasRelaxationReportingConfig* from the UE Inactive AS context, if stored;

1> release *multiRx-PreferenceReportingConfigFR2* if configured, and stop timer T346m, if running;

1> release *aerial-FlightPathAvailabilityConfig* from the UE Inactive AS context, if stored;

1> release *ul-TrafficInfoReportingConfig* from the UE Inactive AS context, if stored;

1> stop all instances of timer T346l, if running;

1> if the UE is acting as L2 U2N Remote UE:

2> apply the specified configuration of SL-RLC0 used for the delivery of RRC message over SRB0 as specified in 9.1.1.4;

2> apply the SDAP configuration and PDCP configuration as specified in 9.1.1.2 for SRB0;

1> else:

2> apply the CCCH configuration as specified in 9.1.1.2;

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

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

2> if the resume procedure is initiated in a cell that is different to the PCell in which the UE received the stored *sdt-MAC-PHY-CG-Config*:

3> release the stored *sdt-MAC-PHY-CG-Config*;

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

1> if *ncd-SSB-RedCapInitialBWP-SDT* is configured:

2> if the resume procedure is initiated in a cell that is different to the PCell in which the UE received the stored *ncd-SSB-RedCapInitialBWP-SDT*:

3> release the stored *ncd-SSB-RedCapInitialBWP-SDT;*

1> if conditions for initiating SDT in accordance with 5.3.13.1b are fulfilled:

2> consider the resume procedure is initiated for SDT;

2> start timer T319a when the lower layers first transmit the CCCH message;

2> consider SDT procedure is ongoing;

1> else:

2> start timer T319;

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

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

2> indicate TA report initiation to lower layers;

1> set the variable *pendingRNA-Update* to *false*;

1> release *successHO-Config* from the UE Inactive AS context, if stored;

1> release *successPSCell-Config* configured by the PCell from the UE Inactive AS context, if stored;

1> release *successPSCell-Config* configured by the PSCell from the UE Inactive AS context, if stored;

1> initiate transmission of the *RRCResumeRequest* message or *RRCResumeRequest1* in accordance with 5.3.13.3.

#### 5.3.13.3 Actions related to transmission of *RRCResumeRequest* or *RRCResumeRequest1* message

The UE shall set the contents of *RRCResumeRequest* or *RRCResumeRequest1* message as follows:

1> if *useFullResumeID* is signalled in *SIB1*:

2> select *RRCResumeRequest1* as the message to use;

2> set the *resumeIdentity* to the stored *fullI-RNTI* value;

1> else:

2> select *RRCResumeRequest* as the message to use;

2> set the *resumeIdentity* to the stored *shortI-RNTI* value;

1> restore the RRC configuration, RoHC state, the EHC context(s), the UDC state, the stored QoS flow to DRB mapping rules and the KgNB and KRRCint keys from the stored UE Inactive AS context except for the following:

- masterCellGroup;

- mrdc-SecondaryCellGroup, if stored; and

- pdcp-Config;

1> set the *resumeMAC-I* to the 16 least significant bits of the MAC-I calculated:

2> over the ASN.1 encoded as per clause 8 (i.e., a multiple of 8 bits) *VarResumeMAC-Input*;

2> with the KRRCint key in the UE Inactive AS Context and the previously configured integrity protection algorithm; and

2> with all input bits for COUNT, BEARER and DIRECTION set to binary ones;

1> derive the KgNB key based on the current KgNB key or the NH, using the *nextHopChainingCount* value received in the previous *RRCRelease* message and stored in the UE Inactive AS Context, as specified in TS 33.501 [11];

1> derive the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key;

1> configure lower layers to apply integrity protection for all radio bearers except SRB0 and MRBs using the configured algorithm and the KRRCint key and KUPint key derived in this clause immediately, i.e., integrity protection shall be applied to all subsequent messages received and sent by the UE;

NOTE 1: Only DRBs with previously configured UP integrity protection shall resume integrity protection.

1> configure lower layers to apply ciphering for all radio bearers except SRB0 and MRBs and to apply the configured ciphering algorithm, the KRRCenc key and the KUPenc key derived in this clause, i.e. the ciphering configuration shall be applied to all subsequent messages received and sent by the UE;

1> re-establish PDCP entities for SRB1;

1> resume SRB1;

1> if the resume procedure is initiated for SDT:

2> for each radio bearer that is configured for SDT and for SRB1:

3> restore the *RLC-BearerConfig* associated with the RLC bearers of *masterCellGroup* and *pdcp-Config* from the UE Inactive AS context;

3> if the radio bearer is a DRB configured with Ethernet Header Compression:

4> indicate to lower layer that *ethernetHeaderCompression* is not configured;

3> if the radio bearer is a DRB configured with UDC:

4> indicate to lower layer that *uplinkDataCompression* is not configured;

3> if the radio bearer is a DRB configured with ROHC function:

4> if *sdt-DRB-ContinueROHC* is set to *cell* and the resume procedure is initiated in a cell that is the same as the PCell in which the UE received the previous *RRCRelease* message; or

4> if *sdt-DRB-ContinueROHC* is set to *rna* and the resume procedure is initiated in a cell belonging to the same RNA as the PCell in which the UE received the previous *RRCRelease* message:

5> indicate to lower layer that *drb-continueROHC* is configured;

4> else:

5> indicate to lower layer that *drb-continueROHC* is not configured;

3> re-establish PDCP entity for the radio bearer that is configured for SDT without triggering PDCP status report;

2> resume all the radio bearers that are configured for SDT;

1> submit the selected message *RRCResumeRequest* or *RRCResumeRequest1* for transmission to lower layers.

NOTE 2: Only DRBs with previously configured UP ciphering shall resume ciphering.

NOTE 2a: Before the lower layers first transmit the *RRCResumeRequest* or *RRCResumeRequest1*, the UE may initiate a new resume procedure if other conditions for initiation of the resume procedure as specified in 5.3.13.2 are satisfied.

If lower layers indicate an integrity check failure while T319 is running or SDT procedure is ongoing, perform actions specified in 5.3.13.5.

If the UE is an (e)RedCap UE and the RedCap-specific initial downlink BWP is not associated with CD-SSB, the UE may continue cell re-selection related measurements as well as cell re-selection evaluation, otherwise the UE shall continue cell re-selection related measurements as well as cell re-selection evaluation. If the conditions for cell re-selection are fulfilled, the UE shall perform cell re-selection as specified in 5.3.13.6.

NOTE 3: For L2 U2N Remote UE or L2 Intermediate U2N Relay UE in RRC\_INACTIVE, the cell (re)selection procedure as specified in TS 38.304 [20] and relay (re)selection procedure as specified in 5.8.15.3 are performed independently and it is up to UE implementation to select either a cell or a L2 U2N Relay UE.

#### 5.3.13.4 Reception of the *RRCResume* by the UE

The UE shall:

1> stop timer T319, if running;

1> stop timer T319a, if running and consider SDT procedure is not ongoing;

1> stop timer T380, if running;

1> if T331 is running:

2> stop timer T331;

2> perform the actions as specified in 5.7.8.3;

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

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

1> else:

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

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

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

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

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

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

1> discard the UE Inactive AS context;

1> store the used *nextHopChainingCount* value associated to the current KgNB;

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

2> reset MAC;

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

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

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

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

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

1> if *srs-PosRRC-InactiveValidityAreaNonPreConfig* is configured; or

1> if *srs-PosRRC-InactiveValidityAreaPreConfigList* is configured and if the cell is not listed in *srs-PosConfigValidityArea*:

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

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

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

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

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

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

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

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

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

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

2> perform the radio bearer configuration according to 5.3.5.6;

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

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

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

2> perform the radio bearer configuration according to 5.3.5.6;

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

2> if *idleInactiveReportAllowed* is included in the *RRCResume* 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 *RRCResumeComplete* 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*, if stored;

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 *RRCResume* message includes the *sl-L2RemoteUE-Config* (i.e. the UE is a L2 U2N Remote UE):

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

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

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

1> resume SRB2 (if suspended), SRB3 (if configured), SRB4 (if configured), SRB5 (if configured), all DRBs (that are suspended) and multicast MRBs (that are suspended);

NOTE 1: If the SCG is deactivated, resuming SRB3 and all DRBs does not imply that PDCP or RRC PDUs can be transmitted or received on SCG RLC bearers.

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

1> stop timer T320, if running;

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

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

1> resume measurements if suspended;

1> if T390 is running:

2> stop timer T390 for all access categories;

2> perform the actions as specified in 5.3.14.4;

1> if T302 is running:

2> stop timer T302;

2> perform the actions as specified in 5.3.14.4;

1> enter RRC\_CONNECTED;

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

1> stop the cell re-selection procedure;

1> stop relay reselection procedure if any for L2 U2N Remote UE;

1> consider the current cell to be the PCell;

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

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

2> if upper layers provides a PLMN:

3> if the UE is either allowed or instructed to access the PLMN via a cell for which at least one CAG ID is broadcast:

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

3> else:

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

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

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

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

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

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

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

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

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

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

4> if *validatedMeasurementsReq* is included in the *RRCResume* and *measIdleValidityDuration* is included in *VarEnhMeasIdleConfig*;

5> set the *measResultIdleEUTRA* in the *RRCResumeComplete* 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*;

5> set the *measResultIdleNR* in the *RRCResumeComplete* 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*;

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

5> remove the *measIdleValidityDuration* in *VarEnhMeasIdleConfig*;

4> else:

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

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

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

5> remove the *measIdleValidityDuration* in *VarEnhMeasIdleConfig*, if stored;

3> else:

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

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

5> include the *idleMeasAvailable*;

2> if the *reselectionMeasurementReq* is included in the *RRCResume* message:

3> if *validatedMeasurementsReq* is included in the *RRCResume* and *measReselectionValidityDuration* is included in *VarMeasReselectionConfig*:

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

5> if the UE has valid cell reselection measurements results for any frequency listed in *measReselectionCarrierListNR* in *VarMeasRelectionConfig*:

6> set the *measResultReselectionNR* in the *RRCResumeComplete* message to the valid NR measurement results, if available for any frequency listed in *measReselectionCarrierListNR* in *VarMeasReselectionConfig* and set *validityStatus* to the value of *measReselectionValidityDuration* in *VarMeasReselectionConfig*;

4> else:

5> if the UE has valid NR cell reselection measurements results:

6> set the *measResultReselectionNR* in the *RRCResumeComplete* message to any available valid NR measurement results, if available, and set *validityStatus* to the value of *measReselectionValidityDuration* in *VarMeasReselectionConfig*;

3> else:

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

5> if the UE has cell reselection measurements results for any frequency listed in *measReselectionCarrierListNR* in *VarMeasRelectionConfig*:

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

4> else:

5> if the UE has NR cell reselection measurements results:

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

2> else:

3> if the *SIB1* contains *reselectionMeasurementsNR*:

4> if *measReselectionCarrierListNR* is present in *VarMeasReselectionConfig* and the UE has NR reselection measurements available for any frequency listed in *measReselectionCarrierListNR* in *VarMeasReselectionConfig*; or

4> if *measReselectionCarrierListNR* is not present in *VarMeasReselectionConfig* and if the UE has NR reselection measurements available:

5> include the *reselectionMeasAvailable*;

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

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

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

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

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

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

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

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

4> include the *logMeasAvailableWLAN* in the *RRCResumeComplete* 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 *RRCResumeComplete* 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 *RRCResumeComplete* 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* orin 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 registered SNPN identity is equal to *snpn-Identity* in *networkIdentity* stored in *VarConnEstFailReport* or any entry of *VarConnEstFailReportList*:

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

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

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

2> if the UE has successful PSCell change or addition related 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 *RRCResumeComplete* 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 *RRCResumeComplete* message;

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

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

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

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

2> if the UE has at least one stored application layer measurement configuration with *appLayerIdleInactiveConfig* configured:

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

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

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

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

4> if *requestedTargetBandFilterNR* is configured, 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; otherwise, include an entry in *interFreq-needForGap* and set the corresponding gap requirement information for each supported NR band;

3> if the *needForInterruptionConfigNR* is enabled:

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

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

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

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

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

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

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

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

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

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

4> if *requestedTargetBandFilterNCSG-NR* is configured:

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

4> else:

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

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

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

4> if *requestedTargetBandFilterNCSG-EUTRA* is configured:

5> 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;

4> else:

5> include an entry for each supported E-UTRA band in *needForNCSG-EUTRA* and set the corresponding NCSG requirement information;

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

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

2> if the UE has flight path information available:

3> include *flightPathInfoAvailable*;

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

1> the procedure ends.

NOTE 2: Network only configures at most one of *reportUplinkTxDirectCurrent, reportUplinkTxDirectCurrentTwoCarrier* or *reportUplinkTxDirectCurrentMoreCarrier* in one RRC message*.*

NOTE 3: Upon reception of *musim-CapRestrictionInd* in *RRCResumeComplete*, 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*.

#### 5.3.13.5 Handling of failure to resume RRC Connection

The UE shall:

1> if timer T319 expires:

2> if the UE supports multiple CEF report:

3> if UE is not in SNPN access mode and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-identity* in *networkIdentity* stored in *VarConnEstFailReport*; or

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

4> if the cell identity of current cell is not equal to the cell identity stored in *measResultFailedCell* in *VarConnEstFailReport* and if the *maxCEFReport-r17* has not been reached:

5> append the VarConnEstFailReport as a new entry in the VarConnEstFailReportList;

2> if the UE is not in SNPN access mode and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* and if the RPLMN is not equal to *plmn-identity* stored in *VarConnEstFailReport*; or

2> if the UE is in SNPN access mode and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReport* and if the registered SNPN identity is not equal to *snpn-identity* in *networkIdentity* stored in *VarConnEstFailReport*; or

2> if the cell identity of current cell is not equal to the cell identity stored in *measResultFailedCell* in *VarConnEstFailReport*:

3> reset the *numberOfConnFail* to 0;

2> if the UE supports multiple CEF report and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReportList* and if the RPLMN is not equal to *plmn-identity* in *networkIdentity* stored in any entry of *VarConnEstFailReportList*:

2> if the UE supports multiple CEF report and if the UE has connection establishment failure information or connection resume failure information available in *VarConnEstFailReportList* and if the registered SNPN identity is not equal to *snpn-identity* in *networkIdentity* stored in any entry of *VarConnEstFailReportList*:

3> clear the content included in *VarConnEstFailReportList*;

2> clear the content included in *VarConnEstFailReport* except for the *numberOfConnFail*, if any;

2> store the following connection resume failure information in the *VarConnEstFailReport* by setting its fields as follows:

3> if the UE is not in SNPN access mode:

4> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 24.501 [23]) from the PLMN(s) included in the *plmn-IdentityInfoList* in *SIB1*;

3> else if the UE is in SNPN access mode:

4> set the *snpn-Identity* in *networkIdentity* to include the SNPN identity selected by upper layers (see TS 24.501 [23]) from the list of SNPN(s) included in the *npn-IdentityInfoList* in *SIB1*;

3> set the *measResultFailedCell* to include the global cell identity, tracking area code, the cell level and SS/PBCH block level RSRP, and RSRQ, and SS/PBCH block indexes, of the failed cell based on the available SSB measurements collected up to the moment the UE detected connection resume failure;

3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements for at most the following number of neighbouring cells: 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency/ set of frequencies per RAT and according to the following:

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

NOTE: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 38.133 [14].

3> if available, set the *locationInfo* as in 5.3.3.7;

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

3> if *numberOfConnFail* is smaller than 8:

4> increment the *numberOfConnFail* by 1;

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

1> else if upon receiving integrity check failure indication from lower layers while T319 is running:

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

1> else if indication from the MCG RLC that the maximum number of retransmissions has been reached is received while SDT procedure is ongoing; or

1> if random access problem indication is received from MCG MAC while SDT procedure is ongoing; or

1> if 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; or

1> if integrity check failure indication is received from lower layers while SDT procedure is ongoing; or

1> if T319a expires:

2> consider SDT procedure is not ongoing;

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

The UE may discard the connection resume failure or connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport* and the UE variable *VarConnEstFailReportList*, 48 hours after the last connection resume failure is detected.

The L2 U2N Relay UE either indicates to upper layers (to trigger PC5 unicast link release with its child UE(s)) or sends *NotificationMessageSidelink* message to the connected L2 U2N Remote UE(s) to the child UE(s) in accordance with 5.8.9.10.

#### 5.3.13.6 Cell re-selection or cell selection or L2 U2N relay (re)selection while T390, T319 or T302 is running or SDT procedure is ongoing (UE in RRC\_INACTIVE) or SRS transmission in RRC\_INACTIVE is configured

The UE shall:

1> if cell reselection occurs while T319 or T302 is running or while SDT procedure is ongoing; or

1> if relay (re)selection or cell selection by a L2 U2N Remote UE or by L2 Intermediate U2N Relay UE occurs while T319 is running; or

1> if cell changes due to relay reselection or cell selection by a L2 U2N Remote UE or by L2 Intermediate U2N Relay UE while T302 is running:

2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with release cause 'RRC Resume failure';

1> else if cell selection or reselection occurs while T390 is running, or cell change due to relay selection or reselection occurs while T390 is running:

2> stop T390 for all access categories;

2> perform the actions as specified in 5.3.14.4.

1> else if cell reselection occurs when *srs-PosRRC-Inactive* is configured:

2> indicate to the lower layer to stop *inactivePosSRS-TimeAlignmentTimer*;

2> release the *srs-PosRRC-Inactive*.

1> else if cell reselection occurs when *srs-PosRRC-InactiveValidityAreaPreConfigList* or *srs-PosRRC-InactiveValidityAreaNonPreConfig* is configured and if there is an on-going SRS for positioning transmission procedure in RRC\_INACTIVE:

2> if the selected cell is not included in the *srs-PosConfigValidityArea*:

3> indicate to the lower layer to stop *inactivePosSRS-ValidityAreaTAT*;

3> initiate RRC connection resume procedure in 5.3.13.2;

2> else if the cell is included in the *srs-PosConfigValidityArea*:

3> if the selected cell and the previously camped cell are in the same *srs-PosConfigValidityArea*:

4> if *autonomousTA-AdjustmentEnabled* is configured and if the Timing Advance validation requirements specified in clause 5.6.6.3 of TS 38.133 [14] is met:

5> indicate to the lower layer to update Timing Advance and stored RSRP;

4> instruct lower layers to continue transmitting SRS if Timing Advance validation condition as specified in TS 38.321 [3] are satisfied;

3> if the selected cell and previously camped cell are in the different *srs-PosConfigValidityArea*:

4> initiate RRC connection resume procedure in 5.3.13.2;

4> indicate to the lower layer to stop *inactivePosSRS-ValidityAreaTAT*.

#### 5.3.13.7 Reception of the *RRCSetup* by the UE

The UE shall:

1> perform the RRC connection setup procedure as specified in 5.3.3.4.

#### 5.3.13.8 RNA update

In RRC\_INACTIVE state, the UE shall:

1> if T380 expires; or

1> if RNA Update is triggered at reception of SIB1, as specified in 5.2.2.4.2:

2> if T319 is not running and SDT procedure is not ongoing:

3> initiate RRC connection resume procedure in 5.3.13.2 with *resumeCause* set to *rna-Update*;

1> if barring is alleviated for Access Category '8' or Access Category '2', as specified in 5.3.14.4:

2> if upper layers do not request RRC the resumption of an RRC connection, and

2> if the variable *pendingRNA-Update* is set to *true*:

3> initiate RRC connection resume procedure in 5.3.13.2 with *resumeCause* value set to *rna-Update*.

If the UE in RRC\_INACTIVE state fails to find a suitable cell and camps on the acceptable cell to obtain limited service as defined in TS 38.304 [20], the UE shall:

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

NOTE: It is left to UE implementation how to behave when T380 expires while the UE is camped neither on a suitable nor on an acceptable cell.

#### 5.3.13.9 Reception of the *RRCRelease* by the UE

The UE shall:

1> perform the actions as specified in 5.3.8.

#### 5.3.13.10 Reception of the *RRCReject* by the UE

The UE shall:

1> perform the actions as specified in 5.3.15.

#### 5.3.13.11 Inability to comply with *RRCResume*

The UE shall:

1> if the UE is unable to comply with (part of) the configuration included in the *RRCResume* message;

2> perform the actions upon going to RRC\_IDLE as specified in 5.3.11 with release cause ′RRC Resume failure′.

NOTE 1: The UE may apply above failure handling also in case the *RRCResume* message causes a protocol error for which the generic error handling as defined in 10 specifies that the UE shall ignore the message.

NOTE 2: If the UE is configured (i.e., via SIB1) to send MUSIM temporary capability restriction indication, and if the UE supports MUSIM temporary capability restriction, the UE does not apply above failure handling in case the UE is unable to apply (part of) the configuration resulting from *RRCResume* message due to UE temporary capability restriction for MUSIM operation. If UE does not go to RRC\_IDLE in this case, UE still considers the configuration resulting from the *RRCResume* message as the current configuration as the baseline for delta configuration for future reconfigurations. It is up to UE implementation how to apply *RRCResume* message. For other cases, if the UE is unable to comply with part of the configuration, it does not apply any (part of) the configuration, i.e. there is no partial success/failure.

#### 5.3.13.12 Inter RAT cell reselection

Upon reselecting to 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 'other'.

================================NEXT CHANGE=====================================

### 5.3.15 RRC connection reject

#### 5.3.15.1 Initiation

The UE initiates the procedure upon the reception of *RRCReject* when the UE tries to establish or resume an RRC connection.

#### 5.3.15.2 Reception of the *RRCReject* by the UE

The UE shall:

1> stop timer T300, if running;

1> stop timer T319, if running;

1> stop timer T319a, if running and consider SDT procedure is not ongoing;

1> stop timer T302, if running;

1> reset MAC and release the default MAC Cell Group configuration (except if the *RRCReject* is received in response to resuming RRC connection for multicast reception);

1> if *waitTime* is configured in the *RRCReject*:

2> start timer T302, with the timer value set to the *waitTime*;

1> if *RRCReject* is received in response to a request from upper layers:

2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2';

1> if *RRCReject* is received in response to an *RRCSetupRequest*:

2> inform upper layers about the failure to setup the RRC connection, upon which the procedure ends;

1> else if *RRCReject* is received in response to an *RRCResumeRequest* or an *RRCResumeRequest1*:

2> if resume is triggered by upper layers:

3> inform upper layers about the failure to resume the RRC connection;

2> if resume istriggered due to an RNA update; or

2> if resume is triggered for SDT and T380 has expired:

3> set the variable *pendingRNA-Update* to *true*;

2> discard the current KgNB key, the KRRCenc key, the KRRCint key, the KUPint key and the KUPenc key derived in accordance with 5.3.13.3;

2> if resume is triggered for SDT:

3> for SRB2, if it is resumed and for SRB1:

4> trigger the PDCP entity to perform SDU discard as specified in TS 38.323 [5];

4> re-establish the RLC entity as specified in TS 38.322 [4];

3> for each DRB that is not suspended:

4> indicate PDCP suspend to lower layers;

4> re-establish the RLC entity as specified in TS 38.322 [4];

2> suspend SRB1 and the radio bearers configured for SDT, if any;

2> the procedure ends.

Upon L2 U2N Relay UE receives *RRCReject*, it either indicates to upper layers (to trigger PC5 unicast link release with its child UE(s)) or sends *NotificationMessageSidelink* message to the connected L2 U2N Remote UE(s) or to the child UE(s) in accordance with 5.8.9.10.

The RRC\_INACTIVE UE shall continue to monitor paging while the timer T302 is running.

NOTE: If timer T331 is running, the UE continues to perform idle/inactive measurements according to 5.7.8.

================================ NEXT CHANGE ================================

## 5.8 Sidelink

### 5.8.1 General

NR sidelink communication consists of unicast, groupcast and broadcast. For unicast, the PC5-RRC connection is a logical connection between a pair of a Source Layer-2 ID and a Destination Layer-2 ID in the AS. The PC5-RRC signalling, as specified in clause 5.8.9, can be initiated after its corresponding PC5 unicast link establishment (TS 23.287 [55]). The PC5-RRC connection and the corresponding sidelink SRBs and sidelink DRB(s) are released when the PC5 unicast link is released as indicated by upper layers.

For each PC5-RRC connection of unicast, one sidelink SRB (i.e. SL-SRB0) is used to transmit the PC5-S message(s) before the PC5-S security has been established. One sidelink SRB (i.e. SL-SRB1) is used to transmit the PC5-S messages to establish the PC5-S security. One sidelink SRB (i.e. SL-SRB2) is used to transmit the PC5-S messages after the PC5-S security has been established, which is protected. One sidelink SRB (i.e. SL-SRB3) is used to transmit the PC5-RRC signalling, which is protected and only sent after the PC5-S security has been established. One sidelink SRB (i.e. SL-SRB4) is used to transmit/receive the NR sidelink discovery messages.

For unicast of NR sidelink communication, AS security comprises of integrity protection of PC5 signalling (SL-SRB1, SL-SRB2 and SL-SRB3) and user data (SL-DRBs), and it further comprises of ciphering of PC5 signaling (SL-SRB1 only for the Direct Link Security Mode Complete message as specified in TS 24.587 [57] for V2X service or TS 24.554 [72] for Proximity-services, SL-SRB2 and SL-SRB3) and user data (SL-DRBs). The ciphering and integrity protection algorithms and parameters for a PC5 unicast link are exchanged by PC5-S messages in the upper layers as specified in TS 33.536 [60], and applied to the corresponding PC5-RRC connection in the AS. Once AS security is activated for a PC5 unicast link in the upper layers as specified in TS 33.536 [60], all messages on SL-SRB2 and SL-SRB3 and/or user data on SL-DRBs of the corresponding PC5-RRC connection are integrity protected and/or ciphered by the PDCP.

For unicast of NR sidelink communication, if the change of the key is indicated by the upper layers as specified in TS 24.587 [57] or TS 24.554 [72], UE re-establishes the PDCP entity of the SL-SRB1, SL-SRB2, SL-SRB3 and SL-DRBs on the corresponding PC5-RRC connection.

NOTE 1: In case the configurations for NR sidelink communication are acquired via the E-UTRA, the configurations for NR sidelink communication in *SIB12* and *sl-ConfigDedicatedNR* within *RRCReconfiguration* used in clause 5.8 are provided by the configurations in *SystemInformationBlockType28* and *sl-ConfigDedicatedForNR* within *RRCConnectionReconfiguration* as specified in TS 36.331 [10], respectively.

NOTE 2: In this release, there is one-to-one correspondence between the PC5-RRC connection and the PC5 unicast link as specified in TS 38.300[2].

NOTE 3: All SL-DRBs related to the same PC5-RRC connection have the same activation/deactivation setting for ciphering and the same activation/deactivation setting for integrity protection as specified in TS 33.536 [60].

NOTE 4: When integrity check failure concerning SL-SRB1 for a specific destination is detected, the UE sends an indication to the upper layers [57].

NOTE 5: The selection of NULL algorithms means that the PC5 messages are considered protected for the purposes of being allowed to be sent or received.

### 5.8.2 Conditions for NR sidelink communication/discovery/positioning operation

The UE shall perform NR sidelink communication/discovery/positioning operation only if the conditions defined in this clause are met:

1> if the UE's serving cell is suitable (RRC\_IDLE or RRC\_INACTIVE or RRC\_CONNECTED); and if either the selected cell on the frequency used for NR sidelink communication/discovery/positioning operation belongs to the registered or equivalent PLMN as specified in TS 24.587 [57] or TS 24.554 [72] or the UE is out of coverage on the frequency used for NR sidelink communication/discovery/positioning operation as defined in TS 38.304 [20] and TS 36.304 [27]; or

1> if the UE's serving cell (RRC\_IDLE or RRC\_CONNECTED) fulfils the conditions to support NR sidelink communication/discovery in limited service state as specified in TS 23.287 [55]; and if either the serving cell is on the frequency used for NR sidelink communication/discovery operation or the UE is out of coverage on the frequency used for NR sidelink communication/discovery operation as defined in TS 38.304 [20] and TS 36.304 [27]; or

1> if the UE has no serving cell (RRC\_IDLE).

### 5.8.3 Sidelink UE information for NR sidelink communication/discovery/positioning

#### 5.8.3.1 General



Figure 5.8.3.1-1: Sidelink UE information for NR sidelink communication/discovery/positioning

The purpose of this procedure is to inform the network that the UE:

- is interested or no longer interested to receive or transmit NR sidelink communication/discovery/positioning,

- is requesting assignment or release of transmission resource for NR sidelink communication/discovery/positioning,

- is reporting QoS parameters and QoS profile(s) related to NR sidelink communication,

- is reporting mapped frequency(ies) for each QoS flow related to NR sidelink communication,

- is reporting associated Tx Profile for each QoS flow related to NR sidelink groupcast and broadcast communication,

- is reporting that a sidelink radio link failure, sidelink RRC reconfiguration failure or a sidelink carrier failure has been detected,

- is reporting the sidelink UE capability information of the associated peer UE for unicast communication,

- is reporting the RLC mode information of the sidelink data radio bearer(s) received from the associated peer UE for unicast communication,

- is reporting the accepted sidelink DRX configuration received from the associated peer UE for NR sidelink unicast reception,

- is reporting the sidelink DRX assistance information received from the associated peer UE for NR sidelink unicast transmission, when the UE is configured with *sl-ScheduledConfig*,

- is reporting, for NR sidelink groupcast transmission, the sidelink DRX on/off indication for the associated Destination Layer-2 ID, when the UE is configured with *sl-ScheduledConfig*,

- is reporting, for NR sidelink groupcast or broadcast reception, the Destination Layer-2 ID and QoS profile(s) associated with its interested services to which sidelink DRX is applied,

- is reporting DRX configuration reject information from its associated peer UE for NR sidelink unicast transmission, when the UE is configured with *sl-ScheduledConfig*,

- is reporting parameters related to single hop or multi hop U2N relay operation,

- is reporting parameters related to U2U relay operation.

#### 5.8.3.2 Initiation

A UE capable of NR sidelink communication or NR sidelink discovery or NR sidelink U2N relay operation including multi hop relay operation or NR sidelink U2U relay operation or NR sidelink positioning that is in RRC\_CONNECTED may initiate the procedure to indicate it is (interested in) receiving or transmitting NR sidelink communication or NR sidelink discovery or NR sidelink U2N relay operation including multi hop relay operation or NR sidelink U2U relay operation or SL-PRS transmission/reception in several cases including upon successful connection establishment or resuming, upon change of interest, upon changing QoS profile(s), upon receiving *UECapabilityInformationSidelink* from the associated peer UE, upon RLC mode information updated from the associated peer UE or upon change to a PCell providing *SIB12* including *sl-ConfigCommonNR,* or upon change to a PCell providing *SIB23* including *sl-PosConfigCommonNR*. A UE capable of NR sidelink communication may initiate the procedure to request assignment of dedicated sidelink DRB configuration and transmission resources for NR sidelink communication transmission. A UE capable of NR sidelink communication may initiate the procedure to report to the network that a sidelink radio link failure, sidelink RRC reconfiguration failure or sidelink carrier failure has been declared. A UE capable of NR sidelink discovery may initiate the procedure to request assignment of dedicated resources for NR sidelink discovery transmission or NR sidelink discovery reception. A UE capable of U2N relay operation including multi hop relay operation may initiate the procedure to report/update parameters for acting as U2N Relay UE or U2N Remote UE (including L2 U2N Remote UE's source L2 ID). A UE capable of U2U relay operation may initiate the procedure to report/update parameters for acting as U2U Relay UE or U2U Remote UE. A UE capable of NR sidelink positioning may initiate the procedure to request it is interested or no longer interested in either transmitting SL-PRS or receiving SL-PRS.

A UE capable of NR sidelink operation that is in RRC\_CONNECTED may initiate the procedure to report the sidelink DRX configuration received from the associated peer UE for NR sidelink unicast reception, upon accepting the sidelink DRX configuration from the associated peer UE. A UE capable of NR sidelink communication that is configured with *sl-ScheduledConfig* and is performing sidelink unicast transmission may initiate the procedure to report the sidelink DRX assistance information or the sidelink DRX configuration reject information received from the associated peer UE, upon receiving either of them from the associated peer UE. A UE capable of NR sidelink communication that is configured with *sl-ScheduledConfig* and is performing sidelink groupcast transmission may initiate the procedure to report the sidelink DRX on/off indication for the associated Destination Layer-2 ID. A UE capable of NR sidelink communication that is in RRC\_CONNECTED may initiate the procedure to report the frequency(ies) and Tx Profile associated with each QoS flow for NR sidelink groupcast or broadcast transmission. A UE capable of NR sidelink communication that is in RRC\_CONNECTED may initiate the procedure to report the frequency(ies) associated with each QoS flow for NR sidelink unicast transmission.

A UE capable of NR sidelink operation that is in RRC\_CONNECTED may initiate the procedure to report the Destination Layer-2 ID and QoS profile(s) associated with its interested service(s) that sidelink DRX is applied, for NR sidelink groupcast or broadcast reception.

Upon initiating this procedure, the UE shall:

1> if *SIB12* including *sl-ConfigCommonNR* is provided by the PCell:

2> ensure having a valid version of *SIB12* for the PCell;

2> if configured by upper layers to receive NR sidelink communication on the frequency included in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* in *SIB12* of the PCell:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxInterestedFreqList*; or if the frequency configured by upper layers to receive NR sidelink communication on has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink communication reception frequency of interest in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxInterestedFreqList*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in NR sidelink communication reception in accordance with 5.8.3.3;

2> if configured by upper layers to transmit non-relay NR sidelink communication on the frequency included in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* in *SIB12* of the PCell; or

2> if configured by upper layer to transmit NR sidelink L3 U2U relay communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3-U2U-RelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqList*; or if the information carried by the *sl-TxResourceReqList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink communication transmission resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqList*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink communication transmission resources in accordance with 5.8.3.3;

2> if configured by upper layer to receive NR sidelink non-relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-NonRelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR* or connected to a PCell providing *SIB12* but not including *sl-NonRelayDiscovery*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxInterestedFreqListDisc*; or if the frequency configured by upper layers to receive NR sidelink non-relay discovery messages on has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink non-relay discovery reception frequency of interest in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxInterestedFreqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in NR sidelink non-relay discovery messages reception in accordance with 5.8.3.3;

2> if configured by upper layer to receive NR sidelink L2 U2N[RIL]: Z451, SLRelay relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2U2N-Relay*; [RIL]: Z453, SLRelayor if configured by upper layer to receive NR sidelink L3 U2N relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3U2N-RelayDiscovery*; or

2> if configured by upper layer to receive NR sidelink L2 U2U relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2-U2U-Relay*; or

2> if configured by upper layer to receive NR sidelink L3 U2U relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3-U2U-RelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR*; or connected to a PCell providing *SIB12* but not including *sl-L2U2N-Relay* in case of L2 U2N[RIL]: Z451, SLRelay relay operation;[RIL]: Z453, SLRelay or connected to a PCell providing *SIB12* but not including *sl-L3U2N-RelayDiscovery* in case of L3 U2N relay operation; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell providing *SIB12* but not including *sl-L2-U2U-Relay* in case of L2 U2U relay operation; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell providing *SIB12* but not including *sl-L3-U2U-RelayDiscovery* in case of L3 U2U relay operation; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxInterestedFreqListDisc*; or if the frequency configured by upper layers to receive NR sidelink relay discovery messages on has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> if the UE is capable of [RIL]: O502, SLRelay U2N Relay UE or Last U2N Relay UE, and if *SIB12* includes *sl-RelayUE-ConfigCommon*; or

4> if the UE is capable of Intermediate U2N Relay UE, and if *SIB12* includes *sl-RelayUE-ConfigCommonMH*; or

4> if the UE is selecting a U2N Relay UE / has a selected U2N Relay UE, and if *SIB12* includes *sl-RemoteUE-ConfigCommon*; or

4> if the UE is capable of U2U Relay UE, and if *SIB12* includes *sl-RelayUE-ConfigCommonU2U*; or

4> if the UE is selecting a U2U Relay UE / has a selected U2U Relay UE, and if *SIB12* includes *sl-RemoteUE-ConfigCommonU2U*:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink relay discovery reception frequency of interest in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxInterestedFreqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in NR sidelink relay discovery messages reception in accordance with 5.8.3.3;

2> if configured by upper layer to transmit NR sidelink non-relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-NonRelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR* or connected to a PCell providing *SIB12* but not including *sl-NonRelayDiscovery*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqListDisc*; or if the information carried by the *sl-TxResourceReqListDisc* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink non-relay discovery messages resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink non-relay discovery messages resources in accordance with 5.8.3.3;

2> if configured by upper layer to transmit NR sidelink L2 U2N[RIL]: Z451, SLRelay relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2U2N-Relay*;[RIL]: Z453, SLRelay or if configured by upper layer to transmit NR sidelink L3 U2N relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3U2N-RelayDiscovery*; or

2> if configured by upper layer to transmit NR sidelink L2 U2U relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2-U2U-Relay*; or

2> if configured by upper layer to transmit NR sidelink L3 U2U relay discovery messages on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3-U2U-RelayDiscovery*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR*; or connected to a PCell providing *SIB12* but not including *sl-L2U2N-Relay* in case of L2 U2N[RIL]: Z451, SLRelay relay operation;[RIL]: Z453, SLRelay or connected to a PCell providing *SIB12* but not including *sl-L3U2N-RelayDiscovery* in case of L3 U2N relay operation; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell providing *SIB12* but not including *sl-L2-U2U-Relay* in case of L2 U2U relay operation;

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell providing *SIB12* but not including *sl-L3-U2U-RelayDiscovery* in case of L3 U2U relay operation; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqListDisc*; or if the information carried by the *sl-TxResourceReqListDisc* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> if the UE is capable of U2N Relay UE or of Last U2N Relay UE [RIL]: O503, SLRelay, and if *SIB12* includes *sl-RelayUE-ConfigCommon*, and if the U2N Relay UE[RIL]: X500, SLRelay or if the Last U2N Relay UE threshold conditions as specified in 5.8.14.2 are met; or

4> if the UE is capable of Intermediate U2N Relay UE, and if SIB12 includes sl-RelayUE-ConfigCommonMH [RIL]: O503, SLRelay; or

4> if the UE is selecting a U2N Relay UE / has a selected U2N Relay UE/ configured with measurement object associated to L2 U2N Relay UEs, and if *SIB12* includes *sl-RemoteUE-ConfigCommon*, and if the U2N Remote UE threshold conditions as specified in 5.8.15.2 are met; or

4> if the UE is capable of U2U Relay UE, and if *SIB12* includes *sl-RelayUE-ConfigCommonU2U*, and if the U2U Relay UE threshold conditions as specified in 5.8.16.2 are met; or

4> if the UE is selecting a U2U Relay UE / has a selected U2U Relay UE, and if *SIB12* includes *sl-RemoteUE-ConfigCommonU2U*, and if the U2U Remote UE threshold conditions as specified in 5.8.17.2 are met:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink relay discovery messages resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqListDisc*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink relay discovery messages resources in accordance with 5.8.3.3;

2> if configured by upper layer to transmit NR sidelink L2 U2N[RIL]: Z451, SLRelay relay communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2U2N-Relay*;[RIL]: Z453, SLRelay or if configured by upper layer to transmit NR sidelink L3 U2N relay communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L3U2N-RelayDiscovery*; or

2> if configured by upper layer to transmit NR sidelink L2 U2U relay communication on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell including *sl-L2-U2U-Relay*:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-ConfigCommonNR*; or connected to a PCell providing *SIB12* but not including *sl-L2U2N-Relay* in case of L2 U2N[RIL]: Z451, SLRelay relay operation;[RIL]: Z453, SLRelay or connected to a PCell providing *SIB12* but not including *sl-L3U2N-RelayDiscovery* in case of L3 U2N relay operation; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell providing *SIB12* but not including *sl-L2-U2U-Relay* in case of L2 U2U relay operation; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqL2U2N-Relay*; or if the information carried by the *sl-TxResourceReqL2U2N-Relay* has changed since the last transmission of the *SidelinkUEInformationNR* message; or if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqL3U2N-Relay*; or if the information carried by the *sl-TxResourceReqL3U2N-Relay* has changed since the last transmission of the *SidelinkUEInformationNR* message; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-TxResourceReqL2-U2U*; or if the information carried by the *sl-TxResourceReqL2-U2U* has changed since the last transmission of the *SidelinkUEInformationNR* message; or

3> if configured by upper layers not to transmit either NR sidelink L2 U2N relay communication or NR sidelink L3 U2N relay communication, and if the last transmission of the *SidelinkUEInformationNR* message includes both *sl-TxResourceReqL2U2N-Relay* and *sl-TxResourceReqL3U2N-Relay*:

4> if the UE is capable of U2N Relay UE; or

4> if the UE is selecting a U2N Relay UE / has a selected U2N Relay UE; or

4> if the UE is capable of L2 U2U Relay UE; or

4> if the UE is selecting a L2 U2U Relay UE / has a selected L2 U2U Relay UE:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink relay communication transmission resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-TxResourceReqL2U2N-Relay* or *sl-TxResourceReqL3U2N-Relay* or *sl-TxResourceReqL2-U2U*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink relay communication transmission resources in accordance with 5.8.3.3;

2> if configured by upper layers to perform NR sidelink reception on the frequency included in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* in *SIB12* of the PCell and if *sl-DRX-ConfigCommonGC-BC* is included in *SIB12-IEs*:

3> if the UE received a sidelink DRX configuration in the *RRCReconfigurationSidelink* message for NR sidelink unicast reception from the associated peer UE and the UE accepted the sidelink DRX configuration:

4> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

4> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-DRX-ConfigCommonGC-BC*; or

4> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxDRX-ReportList*; or if the information carried by *sl-RxDRX-ReportList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

5> initiate transmission of the *SidelinkUEInformationNR* message to report the sidelink DRX configuration in accordance with 5.8.3.3;

3> else:

4> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxDRX-ReportList*:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate the sidelink DRX configuration is no longer used in accordance with 5.8.3.3;

3> if the UE is performing NR sidelink groupcast or broadcast reception and is interested in a service that sidelink DRX is applied:

4> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

4> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-DRX-ConfigCommonGC-BC*; or

4> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-RxInterestedGC-BC-DestList*; or if the information carried by *sl-RxInterestedGC-BC-DestList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

5> initiate transmission of the *SidelinkUEInformationNR* message to report the Destination Layer-2 ID and QoS profile(s) associated with the service(s) in accordance with 5.8.3.3;

3> else:

4> if the last transmission of the *SidelinkUEInformationNR* message included *sl-RxInterestedGC-BC-DestList*:

5> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in the service that sidelink DRX is applied in accordance with 5.8.3.3;

2> if configured by upper layers to perform NR sidelink transmission on the frequency included in *sl-FreqInfoList* in *SIB12* of the PCell and *if sl-DRX-ConfigCommonGC-BC* is included in *SIB12-IEs* andif the UE is configured with *sl-ScheduledConfig*:

3> if the UE received a sidelink DRX assistance information or a sidelink DRX configuration reject information from the associated peer UE for NR sidelink unicast transmission:

4> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

4> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-DRX-ConfigCommonGC-BC*; or

4> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-DRX-InfoFromRxList*, or *sl-FailureList*; or if the information carried by *sl-DRX-InfoFromRxList,* or *sl-FailureList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

5> initiate transmission of the *SidelinkUEInformationNR* message to report the sidelink DRX assistance information or the sidelink DRX configuration reject information in accordance with 5.8.3.3;

NOTE: After including the SL-DRX reject information in *sl-FailureList* in the last transmission ofthe *SidelinkUEInformationNR* message, it is up to UE implementation to consider another sidelink DRX rejection of a new SL DRX configuration from the same associated peer UE as "change" of *sl-FailureList.*

3> if the UE is performing NR sidelink groupcast transmission:

4> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

4> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB12* including *sl-DRX-ConfigCommonGC-BC*; or

4> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-DRX-Indication*; or if the information carried by *sl-DRX-Indication* has changed since the last transmission of the *SidelinkUEInformationNR* message:

5> initiate transmission of the *SidelinkUEInformationNR* message to report sidelink DRX on/off indication for the corresponding destination in accordance with 5.8.3.3;

1> if *SIB23* including *sl-PosConfigCommonNR* is provided by the PCell:

2> ensure having a valid version of *SIB23* for the PCell;

2> if configured to perform SL-PRS measurement on the frequency included in *sl-PosFreqInfoList* in *SIB23* of the PCell:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB23* including *sl-PosConfigCommonNR*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-PosRxInterestedFreqList*; or if the frequency configured to receive SL-PRS has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the frequency of interest for SL-PRS reception in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-PosRxInterestedFreqList*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it is no longer interested in SL-PRS reception in accordance with 5.8.3.3;

2> if configured to transmit SL-PRS on the frequency included in *sl-PosFreqInfoList* in *SIB23* of the PCell:

3> if the UE did not transmit a *SidelinkUEInformationNR* message since last entering RRC\_CONNECTED state; or

3> if since the last time the UE transmitted a *SidelinkUEInformationNR* message the UE connected to a PCell not providing *SIB23* including *sl-PosConfigCommonNR*; or

3> if the last transmission of the *SidelinkUEInformationNR* message did not include *sl-PosTxResourceReqList*; or if the information carried by the *sl-PosTxResourceReqList* has changed since the last transmission of the *SidelinkUEInformationNR* message:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink positioning transmission resources required by the UE in accordance with 5.8.3.3;

2> else:

3> if the last transmission of the *SidelinkUEInformationNR* message included *sl-PosTxResourceReqList*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate it no longer requires NR sidelink positioning transmission resources in accordance with 5.8.3.3;

#### 5.8.3.3 Actions related to transmission of *SidelinkUEInformationNR* message

The UE shall set the contents of the *SidelinkUEInformationNR* message as follows and shall include all concerned information, irrespective of what triggered the procedure:

1> if the UE initiates the procedure to indicate it is (no more) interested to receive NR sidelink communication/positioning; or

1> if the UE initiates the procedure to request (configuration/ release) of NR sidelink communication/positioning transmission resources or to report to the network that a sidelink radio link failure, sidelink RRC reconfiguration failure or sidelink carrier failure has been declared; or

1> if the UE initiates the procedure to report to the network the sidelink DRX configuration for NR sidelink unicast reception; or

1> if the UE initiates the procedure to report to the network the sidelink DRX assistance information or the sidelink DRX configuration reject information for NR sidelink unicast transmission; or

1> if the UE initiates the procedure to report to the network the Destination Layer-2 ID and QoS profile(s) associated with its interested service(s) that sidelink DRX is applied for NR sidelink groupcast or broadcast reception; or

1> if the UE initiates the procedure to report to the network the Destination Layer-2 ID and the sidelink DRX on/off indication for the corresponding destination for NR sidelink groupcast transmission; or

1> if the UE initiates the procedure to indicate it is (no more) interested to receive NR sidelink discovery messages; or

1> if the UE initiates the procedure to request (configuration/ release) of NR sidelink discovery messages transmission resources; or

1> if the UE initiates the procedure to request (configuration/ release) of NR sidelink U2N or U2U relay communication transmission resources or report other parameters related to U2N or U2U relay operation:

2> if *SIB12* including *sl-ConfigCommonNR* is provided by the PCell:

3> if configured by upper layers to receive NR sidelink communication:

4> include *sl-RxInterestedFreqList* and set it to the frequency for NR sidelink communication reception;

3> if configured by upper layers to transmit non-relay NR sidelink communication and/or to transmit NR sidelink relay communication; or

3> if configured by upper layers to transmit NR sidelink L3 U2U relay communication and *SIB12* includes *sl-L3-U2U-RelayDiscovery*:

4> include *sl-TxResourceReqList* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink communication resource:

5> set *sl-DestinationIdentity* to the destination identity configured by upper layer for NR sidelink communication transmission;

5> set *sl-CastType* to the cast type of the associated destination identity configured by the upper layer for the NR sidelink communication transmission;

5> set *sl-RLC-ModeIndicationList* to include the RLC mode(s) and optionally QoS profile(s) of the sidelink QoS flow(s) of the associated RLC mode(s), if the associated bi-directional sidelink DRB(s) have been established due to the configurationby *RRCReconfigurationSidelink*;

5> set *sl-QoS-InfoList* to include QoS profile(s) of the sidelink QoS flow(s) of the associated destination configured by the upper layer for the NR sidelink communication transmission;

5> set *sl-TxInterestedFreqList* to indicate the frequency of the associated destination for NR sidelink communication transmission;

5> set *sl-TypeTxSyncList* to the current synchronization reference type used on the associated *sl-TxInterestedFreqList* for NR sidelink communication transmission;

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from the associated peer UE;

5> if *sl-FreqInfoListSizeExt* is included in *SIB12-IEs*:

6> set *sl-QoS-InfoList* to include the frequency(ies), and Tx Profile, if any, mapped to the sidelink QoS flow(s) of the associated destination configured by the upper layer for the NR sidelink groupcast and broadcast communication transmission;

4> if a sidelink radio link failure or a sidelink RRC reconfiguration failure has been declared, according to clauses 5.8.9.3 and 5.8.9.1.8, respectively;

5> include *sl-FailureList* and set its fields as follows for each destination for which it reports the NR sidelink communication failure:

6> set *sl-DestinationIdentity* to the destination identity configured by upper layer for NR sidelink communication transmission;

6> if the sidelink RLF is detected as specified in clause 5.8.9.3:

7> set *sl-Failure* as *rlf* for the associated destination for the NR sidelink communication transmission;

6> else if *RRCReconfigurationFailureSidelink* is received:

7> set *sl-Failure* as *configFailure* for the associated destination for the NR sidelink communication transmission;

4> if a sidelink carrier failure has been indicated by MAC layer;

5> include *sl-CarrierFailureList* and set its fields as follows for each destination for which it reports the sidelink carrier failure:

6> set *sl-DestinationIdentity* to the destination identity for which the concerned sidelink carrier failure is indicated;

6> set *sl-CarrierFailure* to include the concerned carrier for which the sidelink carrier failure is indicated;

3> if *SIB12* includes *sl-NonRelayDiscovery* and if configured by upper layers to receive NR sidelink non-relay discovery messages, or if *SIB12* includes *sl-L2U2N-Relay* and if configured by upper layers to receive NR sidelink L2 U2N[RIL]: Z451, SLRelay relay discovery messages,[RIL]: Z453, SLRelay or if *SIB12* includes *sl-L3U2N-RelayDiscovery* and if configured by upper layers to receive NR sidelink L3 U2N relay discovery messages; or

3> if *SIB12* includes *sl-L2-U2U-Relay* and if configured by upper layers to receive NR sidelink L2 U2U relay discovery messages; or

3> if *SIB12* includes *sl-L3-U2U-RelayDiscovery* and if configured by upper layers to receive NR sidelink L3 U2U relay discovery messages:

4> include *sl-RxInterestedFreqListDisc* and set it to the frequency for NR sidelink discovery messages reception;

3> if *SIB12* includes *sl-L2U2N-Relay*[RIL]: Z454, SLRelay and the UE is capable of L2 U2N remote UE:

4> include *sl-SourceIdentityRemoteUE* and set it to the source identity configured by upper layer for NR sidelink L2 U2N relay communication transmission;

3> if *SIB12* includes *sl-NonRelayDiscovery* and if configured by upper layers to transmit NR sidelink non-relay discovery messages, or if *SIB12* includes *sl-L2U2N-Relay* and if configured by upper layers to transmit NR sidelink L2 U2N relay discovery messages, or if *SIB12* includes *sl-L3U2N-RelayDiscovery* and if configured by upper layers to transmit NR sidelink L3 U2N relay discovery messages; or

3> if *SIB12* includes *sl-L2-U2U-Relay* and if configured by upper layers to transmit NR sidelink L2 U2U relay discovery messages; or

3> if *SIB12* includes *sl-L3-U2U-RelayDiscovery* and if configured by upper layers to transmit NR sidelink L3 U2U relay discovery messages:

4> include *sl-TxResourceReqListDisc* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink discovery messages resource:

5> set *sl-DestinationIdentityDisc* to the destination identity configured by upper layer for NR sidelink discovery messages transmission;

5> if the UE is acting as L2 U2N Relay UE:

6> set *sl-SourceIdentityRelayUE* to the source identity configured by upper layer for NR sidelink L2 U2N relay discovery messages transmission;

5> set *sl-CastTypeDisc* to the cast type of the associated destination identity for the NR sidelink discovery messages transmission;

5> set *sl-TxInterestedFreqListDisc* to indicate the frequency of the associated destination for NR sidelink discovery messages transmission;

5> set *sl-TypeTxSyncListDisc* to the current synchronization reference type used on the associated *sl-TxInterestedFreqListDisc* for NR sidelink discovery messages transmission;

5> set *sl-DiscoveryType* to the current discovery type of the associated destination identity configured by the upper layer for NR sidelink discovery messages transmission;

5> if the UE is acting as L2/L3 U2U Relay UE:[RIL]: Z456, SLRelay

6> include *ue-TypeU2U* and set it to *relayUE*;

5> if the UE is acting as L2/L3 U2U Remote UE:

6> include *ue-TypeU2U* and set it to *remoteUE*;

3> if *SIB12* includes *sl-L2U2N-Relay* and if configured by upper layers to transmit NR sidelink L2 U2N relay communication and the UE is acting as L2 U2N Relay UE:

4> include *sl-TxResourceReqL2U2N-Relay* in *sl-TxResourceReqListCommRelay* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink L2 U2N relay communication resource:

5> set *sl-DestinationIdentityL2U2N* to the destination identity configured by upper layer for NR sidelink L2 U2N relay communication transmission;

5> set *sl-TxInterestedFreqListL2U2N* to indicate the frequency of the associated destination for NR sidelink L2 U2N relay communication transmission;

5> set *sl-TypeTxSyncListL2U2N* to the current synchronization reference type used on the associated *sl-TxInterestedFreqListL2U2N* for NR sidelink L2 U2N relay communication transmission;

5> set *sl-LocalID-Request* to request local ID for L2 U2N Remote UE [RIL]:W500, SLRelay transiting to RRC\_CONNECTED or in RRC\_CONNECTED state;

5> set *sl-PagingIdentityRemoteUE* to the paging UE ID received from peer L2 U2N Remote UE [RIL]:W501, SLRelay, if it is not released as in 5.8.9.8.3;[RIL]: Z455, SLRelay

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from peer UE;

4> include *ue-Type* and set it to *relayUE*;

3> if *SIB12* includes *sl-L2U2N-Relay* and if configured by upper layers to transmit NR sidelink L2 U2N relay communication and the UE has a selected L2 U2N Relay UE:

4> include *sl-TxResourceReqL2U2N-Relay* in *sl-TxResourceReqListCommRelay* and set its fields (if needed) as follows to request network to assign NR sidelink L2 U2N relay communication resource:

5> set *sl-TxInterestedFreqListL2U2N* to indicate the frequency of the associated destination for NR sidelink L2 U2N relay communication transmission;

5> set *sl-TypeTxSyncListL2U2N* to the current synchronization reference type used on the associated *sl-TxInterestedFreqListL2U2N* for NR sidelink L2 U2N relay communication transmission;

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from peer UE;

4> include *ue-Type* and set it to *remoteUE*;

3> if *SIB12* includes *sl-L3U2N-RelayDiscovery* and if configured by upper layers to transmit NR sidelink L3 U2N relay communication:

4> include *sl-TxResourceReqL3U2N-Relay* in *sl-TxResourceReqListCommRelay* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink L3 U2N relay communication resource:

5> set *sl-DestinationIdentity* to the destination identity configured by upper layer for NR sidelink L3 U2N relay communication transmission;

5> set *sl-CastType* to the cast type of the associated destination identity configured by the upper layer for the NR sidelink L3 U2N relay communication transmission;

5> set *sl-RLC-ModeIndicationList* to include the RLC mode(s) and optionally QoS profile(s) of the sidelink QoS flow(s) of the associated RLC mode(s), if the associated bi-directional sidelink DRB(s) have been established due to the configurationby *RRCReconfigurationSidelink*;

5> set *sl-QoS-InfoList* to include QoS profile(s) of the sidelink QoS flow(s) of the associated destination configured by the upper layer for the NR sidelink L3 U2N relay communication transmission;

5> set *sl-TxInterestedFreqList* to indicate the frequency of the associated destination for NR sidelink L3 U2N relay communication transmission;

5> set *sl-TypeTxSyncList* to the current synchronization reference type used on the associated *sl-TxInterestedFreqList* for NR sidelink L3 U2N relay communication transmission;

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from peer UE;

4> include *ue-Type* and set it to *relayUE* if the UE is acting as NR sidelink L3 U2N Relay UE or to *remoteUE* otherwise;

3> if *SIB12* includes *sl-L2-U2U-Relay* and if configured by upper layers to transmit NR sidelink L2 U2U relay communication and the UE is acting as L2 U2U Relay UE:

4> include *sl-TxResourceReqL2-U2U* and set its fields (if needed) as follows for each destination for which it requests network to assign NR sidelink L2 U2U relay communication resource:

5> set *sl-DestinationIdentityL2-U2U* to the destination identity configured by upper layer for NR sidelink L2 U2U relay communication transmission to the target L2 U2U Remote UE;

5> set *sl-TxInterestedFreqListL2-U2U* to indicate the frequency of the associated destination for NR sidelink L2 U2U relay communication transmission;

5> set *sl-TypeTxSyncListL2-U2U* to the current synchronization reference type used on the associated *sl-InterestedFreqListL2-U2U* for NR sidelink L2 U2U relay communication transmission;

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from the target L2 U2U Remote UE;

5> include *sl-U2U-InfoList* and set its fields (if needed) for each entry as follows, to report the related information of the connected L2 U2U Remote UEs:

6> include the source L2 U2U Remote UE's L2 ID in *sl-SourceUE-Identity*;

6> include *sl-PerSLRB-QoS-InfoList*, with each entry including the per-SLRB second-hop QoS profile and the corresponding *sl-RemoteUE-SLRB-Identity* which is set to the same value as the *sl-E2E-SLRB-Index* received in *UEInformationRequestSidelink* message from the L2 U2U Remote UE for the same end-to-end SLRB;

5> set *sl-RLC-ModeIndicationListL2-U2U* to include the RLC mode(s), if the associated bi-directional PC5 Relay RLC channel(s) has been established due to the configurationby *RRCReconfigurationSidelink*;

3> if *SIB12* includes *sl-L2-U2U-Relay* and if configured by upper layers to transmit NR sidelink L2 U2U relay communication and the UE has a selected L2 U2U Relay UE:

4> include *sl-TxResourceReqL2-U2U* and set its fields (if needed) as follows to request network to assign NR sidelink L2 U2U relay communication resource:

5> set *sl-DestinationIdentityL2-U2U* to the destination identity configured by upper layer for NR sidelink L2 U2U relay communication transmission to L2 U2U Relay UE;

5> set *sl-TxInterestedFreqListL2-U2U* to indicate the frequency of the associated destination for NR sidelink L2 U2U relay communication transmission;

5> set *sl-TypeTxSyncListL2-U2U* to the current synchronization reference type used on the associated *sl-InterestedFreqListL2-U2U* for NR sidelink L2 U2U relay communication transmission;

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message received from L2 U2U Relay UE, if any;

5> include *sl-U2U-InfoList* and set its fields (if needed) for each entry as follows to report the related end-to-end and the first hop information for the end-to-end PC5 connection with each target L2 U2U Remote UE:

6> set *sl-TargetUE-Identity* to the destination identity configured by upper layer for NR sidelink L2 U2U relay communication transmission to the target L2 U2U Remote UE;

6> set *sl-E2E-QoS-InfoList* to include end-to-end QoS profile(s) of the sidelink QoS flow(s) of the associated destination configured by the upper layer for the NR sidelink L2 U2U relay communication transmission to the target L2 U2U Remote UE;

6> set *sl-PerHop-QoS-InfoList* to include the first-hop split PDB of the sidelink QoS flow(s) received from the *sl-SplitQoS-InfoListPC5* in *UEInformationResponseSidelink* message for the associated destination in accordance with the received *sl-TargetUE-Identity*;

6> set *sl-CapabilityInformationTargetRemoteUE* to include the related UE capability information received from the target L2 U2U Remote UE, if any;

3> if *sl-DRX-ConfigCommonGC-BC* is included in *SIB12-IEs*:

4> if configured by upper layers to perform NR sidelink reception:

5> include *sl-RxDRX-ReportList* and set its fields (if needed) as follows for each destination for which it reports to network:

6> set *sl-DRX-ConfigFromTx* to include the accepted sidelink DRX configuration of the associated destination for NR sidelink unicast communication, if received from the associated peer UE;

5> include *sl-RxInterestedGC-BC-DestList* and set its fields (if needed) as follows for each Destination Layer-2 ID for which it reports to network:

6> set *sl-RxInterestedQoS-InfoList* to include the QoS profile of its interested service(s) that sidelink DRX is applied for the associated destination for NR sidelink groupcast or broadcast reception;

NOTE 1: It is up to UE implementation to set the QoS profile in *sl-RxInterestedQoS-InfoList* for reception of NR sidelink discovery message or ProSe Direct Link Establishment Request message as described in TS 24.554 [72], or for reception of Direct Link Establishment Request message as described in TS 24.587 [57].

6> set *sl-DestinationIdentity* to the associated destination identity configured by upper layer for NR sidelink groupcast or broadcast reception;

4> if configured by upper layers to perform NR sidelink transmission and configured with *sl-ScheduledConfig*:

5> include *sl-TxResourceReqList* and/or *sl-TxResourceReqListCommRelay* and/or *sl-FailureList* and set its fields (if needed) as follows for each destination for which it reports to network:

6> set *sl-DRX-InfoFromRxList* to include the sidelink DRX assistance information of the associated destination, if any, received from the associated peer UE;

6> if the *RRCReconfigurationCompleteSidelink* message includes the *sl-DRX-ConfigReject*:

7> set *sl-Failure* as *drxReject-v1710* for the associated destination for the NR sidelink communication transmission;

6> set *sl-DRX-Indication* to include the sidelink DRX on/off indication for the associated destination for NR sidelink groupcast transmission;

3> if *SIB12* includes *sl-PRS-ResourcesSharedSL-PRS-RP*:

4> if configured to perform SL-PRS measurements:

5> include *sl-PosRxInterestedFreqList2* and set it to the frequency configured with *sl-PRS-ResourcesSharedSL-PRS-RP* for SL-PRS reception;

4> if configured to transmit SL-PRS:

5> include *sl-PosTxResourceReqList* and set its fields (if needed) as follows for each destination for which it requests network to assign SL-PRS resource:

6> set *sl-PosDestinationIdentity* to the destination identity configured by upper layer for SL-PRS transmission;

6> set *sl-PosCastType* to the cast type of the associated destination identity configured by the upper layer for SL-PRS transmission;

6> set *sl-PosTxInterestedFreqList2* to indicate the frequency configured with *sl-PRS-ResourcesSharedSL-PRS-RP* of the associated destination for SL-PRS transmission;

6> set *sl-PosTypeTxSyncList* to the current synchronization reference type used on the associated *sl-PosRxInterestedFreqLis*t for SL-PRS transmission;

6> set *sl-PosQoS-InfoList* to include the SL-PRS transmission QoS profile;

5> include *sl-TxResourceReqList* and set its fields (if needed) as follows for each destination for which it requests network to assign SL-PRS resource:

6> set *sl-PosDestinationIdentity* to the destination identity configured by upper layer for NR sidelink positioning transmission;

6> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from the associated peer UE;

2> if *SIB23* including *sl-PosConfigCommonNR* is provided by the PCell;

3> if configured to transmit SL-PRS:

4> include *sl-PosTxResourceReqList* and set its fields (if needed) as follows for each destination for which it requests network to assign SL-PRS resource:

5> set *sl-PosDestinationIdentity* to the destination identity configured by upper layer for SL-PRS transmission;

5> set *sl-PosCastType* to the cast type of the associated destination identity configured by the upper layer for the SL-PRS transmission;

5> set *sl-PosTxInterestedFreqList* to indicate the frequency of the associated destination for SL-PRS transmission;

5> set *sl-PosTypeTxSyncList* to the current synchronization reference type used on the associated *sl-PosRxInterestedFreqList* for SL-PRS transmission;

5> set *sl-PosQoS-InfoList* to include the SL-PRS transmission QoS profile;

5> set *sl-CapabilityInformationSidelink* to include *UECapabilityInformationSidelink* message, if any, received from the associated peer UE;

3> if configured to perform SL-PRS measurements;

4> include *sl-PosRxInterestedFreqList* and set it to the frequency for SL-PRS reception;

1> if the UE initiates the procedure while connected to an E-UTRA PCell:

2> submit the *SidelinkUEInformationNR* to lower layers via SRB1, embedded in E-UTRA RRC message *ULInformationTransferIRAT* as specified in TS 36.331 [10], clause 5.6.28;

1> else:

2> submit the *SidelinkUEInformationNR* message to lower layers for transmission.

NOTE 2: When multiple lists are reported in *SidelinkUEInformationNR*, a UE can report up to *maxNrofSL-Dest-r16* SL destinations in *sl-TxResourceReqList*, *sl-TxResourceReqListDisc* and *sl-TxResourceReqListCommRela*y in total.

=================================NEXT CHANGE=======================================

### 5.8.9 Sidelink RRC procedure

#### 5.8.9.1 Sidelink RRC reconfiguration

##### 5.8.9.1.1 General



Figure 5.8.9.1.1-1: Sidelink RRC reconfiguration, successful



Figure 5.8.9.1.1-2: Sidelink RRC reconfiguration, failure

The purpose of this procedure is to modify a PC5-RRC connection, e.g. to establish/modify/release sidelink DRBs or additional sidelink RLC bearer or PC5 Relay RLC channels, to add/release sidelink carrier, to (re-)configure NR sidelink measurement and reporting, to (re-)configure sidelink CSI reference signal resources, to (re)configure CSI reporting latency bound, to (re)configure sidelink DRX, to (re-)configure the latency bound of SL Inter-UE coordination report, and to indicate the SFN-DFN offset in case of single hop.

The UE may initiate the sidelink RRC reconfiguration procedure and perform the operation in clause 5.8.9.1.2 on the corresponding PC5-RRC connection in following cases:

- the release of sidelink DRBs associated with the peer UE, or peer L2 U2U Remote UE in case of L2 U2U Relay operation, as specified in clause 5.8.9.1a.1;

- the establishment of sidelink DRBs associated with the peer UE, or peer L2 U2U Remote UE in case of L2 U2U Relay operation, as specified in clause 5.8.9.1a.2;

- the modification for the parameters included in *SLRB-Config* of sidelink DRBs associated with the peer UE, or peer L2 U2U Remote UE in case of L2 U2U Relay operation, as specified in clause 5.8.9.1a.2;

- the release of additional sidelink RLC bearer associated with the peer UE, as specified in clause 5.8.9.1a.5;

- the establishment of additional sidelink RLC bearer associated with the peer UE, as specified in clause 5.8.9.1a.6;

- the modification for the parameters included in *SL-RLC-BearerConfig* of additional sidelink RLC bearer associated with the peer UE, as specified in clause 5.8.9.1a.6;

- the release of PC5 Relay RLC channels for L2 U2N/U2U Relay UE and Remote UE, as specified in clause 5.8.9.7.1;

- the establishment of PC5 Relay RLC channels for L2 U2N/U2U Relay UE and Remote UE, as specified in clause 5.8.9.7.2;

- the modification for the parameters included in *SL-RLC-ChannelConfigPC5* of PC5 Relay RLC channels for L2 U2N/U2U Relay UE and Remote UE, as specified in clause 5.8.9.7.2;

- the release of sidelink carrier associated with the peer UE, as specified in clause 5.8.9.1b.1;

- the addition of sidelink carrier associated with the peer UE, as specified in clause 5.8.9.1b.2;

- the (re-)configuration of the peer UE to perform NR sidelink measurement and report.

- the (re-)configuration of the sidelink CSI reference signal resources and CSI reporting latency bound;

- the (re-)configuration of the peer UE to perform sidelink DRX;

- the (re-)configuration of the latency bound of SL Inter-UE coordination report;

- the (re-)configuration of the local UE ID pair for L2 U2U Remote UE and its peer L2 U2U Remote UE by L2 U2U Relay UE.

- the response to the request in a *RemoteUEInformationSidelink* message for the SFN-DFN offset from the L2 U2N Remote UE in case of single hop;

- the change in the value of the SFN-DFN offset at the L2 U2N Relay UE.

NOTE: It is up to L2 U2N Relay UE implementation to determine when the SFN-DFN offset has changed in value to a degree requiring an update to be sent to the L2 U2N Remote UE.

In RRC\_CONNECTED, the UE applies the NR sidelink communications parameters provided in *RRCReconfiguration* (if any). In RRC\_IDLE or RRC\_INACTIVE, the UE applies the NR sidelink communications parameters provided in system information (if any). For other cases, UEs apply the NR sidelink communications parameters provided in *SidelinkPreconfigNR* (if any). When UE performs state transition between above three cases, the UE applies the NR sidelink communications parameters provided in the new state, after acquisition of the new configurations. Before acquisition of the new configurations, UE continues applying the NR sidelink communications parameters provided in the old state.

##### 5.8.9.1.2 Actions related to transmission of *RRCReconfigurationSidelink* message

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

1> for each sidelink DRB that is to be released, according to clause 5.8.9.1a.1.1, due to configuration by *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, by upper layers, or due to end-to-end sidelink DRB release:

2> set the entryincluded in the *slrb-ConfigToReleaseList* corresponding to the sidelink DRB;

1> for each sidelink DRB that is to be established or modified, according to clause 5.8.9.1a.2.1, due to receiving *sl-ConfigDedicatedNR,* *SIB12* or *SidelinkPreconfigNR*:

2> if the sidelink DRB is a per-hop sidelink DRB (i.e. the UE is performing NR sidelink communication with a peer UE without via a L2 U2U Relay UE):

3> if a sidelink DRB is to be established:

4> assign a new logical channel identity for the logical channel to be associated with the sidelink DRB and set *sl-MAC-LogicalChannelConfigPC5* in the *SLRB-Config* to include the new logical channel identity;

3> set the *SLRB-Config* included in the *slrb-ConfigToAddModList*, according to the received *sl-RadioBearerConfig* and *sl-RLC-BearerConfig* corresponding to the sidelink DRB;

2> else if the sidelink DRB is an end-to-end sidelink DRB (i.e. the UE is acting as a L2 U2U Remote UE, and configure peer L2 U2U Remote UE with end-to-end SDAP and PDCP):

3> set the *SLRB-Config* (excluding *sl-RLC-ConfigPC5* and *sl-MAC-LogicalChannelConfigPC5*) included in the *slrb-ConfigToAddModList*, according to the received *sl-RadioBearerConfig* corresponding to the sidelink DRB;

1> for each additional sidelink RLC bearer that is to be released, according to clause 5.8.9.1a.5.1, due to configuration by *sl-ConfigDedicatedNR*, *SIB12*, *SidelinkPreconfigNR* or by upper layers:

2> set the entry included in the *sl-RLC-BearerToReleaseList* corresponding to the additional sidelink RLC bearer;

1> for each additional sidelink RLC bearer that is to be established or modified, according to clause 5.8.9.1a.6.1, due to receiving *sl-ConfigDedicatedNR*, *SIB12* or *SidelinkPreconfigNR*:

2> if an additional sidelink RLC bearer is to be established:

3> assign a new logical channel identity for the logical channel to be associated with the additional sidelink RLC bearer and set *sl-MAC-LogicalChannelConfigPC5* in the *SL-RLC-BearerConfig* to include the new logical channel identity;

2> set the *SL-RLC-BearerConfig* included in the *sl-RLC-BearerToAddModList*, according to the received *sl-RadioBearerConfig* and *sl-RLC-BearerConfig* corresponding to the additional sidelink RLC bearer;

1> for each carrier that is to be released, according to clause 5.8.9.1b.1.1:

2> include the corresponding sidelink carrier in the *sl-CarrierToReleaseList*;

1> for each carrier that is to be added, according to clause 5.8.9.1b.2.1:

2> include the corresponding sidelink carrier in the *sl-CarrierToAddModList*;

1> set the *sl-MeasConfig* as follows:

2> If the frequency used for NR sidelink communication is included in *sl-FreqInfoToAddModList*/*sl-FreqInfoToAddModListExt* in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message or included in *sl-ConfigCommonNR* within SIB12:

3> if UE is in RRC\_CONNECTED:

4> set the *sl-MeasConfig* according to stored NR sidelink measurement configuration information for this destination;

3> if UE is in RRC\_IDLE or RRC\_INACTIVE:

4> set the *sl-MeasConfig* according to stored NR sidelink measurement configuration received from *SIB12*;

2> else:

3> set the *sl-MeasConfig* according to the *sl-MeasPreConfig* in *SidelinkPreconfigNR*;

1> set the *sl-LatencyBoundIUC-Report;*

1> start timer T400 for the destination;

1> set the *sl-CSI-RS-Config*;

1> set the *sl-LatencyBoundCSI-Report*;

1> set the *sl-ResetConfig*;

NOTE 1: Whether/how to set the parameters included in *sl-LatencyBoundIUC-Report*, *sl-CSI-RS-Config*, *sl-LatencyBoundCSI-Report* and *sl-ResetConfig* is up to UE implementation.

1> set the *sl-DRX-ConfigUC-PC5* as follows:

2> If the frequency used for NR sidelink communication is included in *sl-FreqInfoToAddModList*/*sl-FreqInfoToAddModListExt* in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message or included in *sl-ConfigCommonNR* within *SIB12*:

3> if UE is in RRC\_CONNECTED and if *sl-ScheduledConfig* is included in *sl-ConfigDedicatedNR* within *RRCReconfiguration*:

4> set the *sl-DRX-ConfigUC-PC5* according to stored NR sidelink DRX configuration information for this destination;

NOTE 2: If UE is in RRC\_IDLE or in RRC\_INACTIVE or out of coverage, or in RRC\_CONNECTED and *sl-UE-SelectedConfig* is included in *sl-ConfigDedicatedNR* within *RRCReconfiguration*, it is up to UE implementation to set the *sl-DRX-ConfigUC-PC5*.

1> for each PC5 Relay RLC channel that is to be released due to configuration by *sl-ConfigDedicatedNR*:

2> set the *SL-RLC-ChannelID* corresponding to the PC5 Relay RLC channel in the *sl-RLC-ChannelToReleaseListPC5*;

1> for each PC5 Relay RLC channel that is to be established or modified due to receiving *sl-ConfigDedicatedNR*:

2> if a PC5 Relay RLC channel is to be established:

3> assign a new logical channel identity for the logical channel to be associated with the PC5 Relay RLC channel and set *sl-MAC-LogicalChannelConfigPC5* in the *SL-RLC-ChannelConfigPC5* to include the new logical channel identity;

2> set the *SL-RLC-ChannelConfigPC5* included in the *sl-RLC-ChannelToAddModListPC5* according to the received *SL-RLC-ChannelConfig* corresponding to the PC5 Relay RLC channel, including setting *sl-RLC-ChannelID-PC5* to the same value of *sl-RLC-ChannelID* received in *SL-RLC-ChannelConfig*;

1> if the UE is operating as a L2 U2N Relay UE:

2> if the destination UE is a L2 U2N Remote UEthat requested the SFN-DFN offset in a previous *RemoteUEInformationSidelink* message:

3> if the SFN-DFN offset has changed since a previous transmission of the *RRCReconfigurationSidelink* message, or no previous transmission of the *RRCReconfigurationSidelink* message has occurred since the reception of the *RemoteUEInformationSidelink* message:

4> set the *sl-SFN-DFN-Offset* according to the relation between the SFN timeline of the PCell and the DFN timeline;

1> if the UE is acting as L2 U2U Relay UE, and if the procedure is initiated to configure local ID pair to a connected L2 U2U Remote UE:

2> if the local ID pair is to be assigned or modified for an end-to-end PC5 connection, and if the per-hop PC5-RRC connection with this L2 U2U Remote UE and the per-hop PC5-RRC connection with its peer L2 U2U Remote UE are successfully established:

3> include an entry in *sl-LocalID-PairList*, and set the fields as below:

4> set *sl-RemoteUE-L2Identity* to the source L2 ID of this L2 U2U Remote UE, and set *sl-RemoteUE-LocalIdentity* to include the new local UE ID assigned to this L2 U2U Remote UE, in the *SL-SRAP-ConfigPC5*;

4> set *sl-PeerRemoteUE-L2Identity* to the source L2 ID of the peer L2 U2U Remote UE, and set *sl-PeerRemoteUE-LocalIdentity* to include the new local UE ID assigned to the peer L2 U2U Remote UE, in the *SL-SRAP-ConfigPC5*;

1> if the UE is acting as L2 U2U Remote UE (i.e. Tx UE) and is in RRC\_IDLE or in RRC\_INACTIVE or out of coverage, and the procedure is initiated to release the first hop PC5 Relay RLC channel of an end-to-end sidelink DRB to the connected L2 U2U Relay UE (i.e. Rx UE) according to clause 5.8.9.7.1; or

1> if the UE is acting as L2 U2U Relay UE (i.e. Tx UE) and is in RRC\_IDLE or in RRC\_INACTIVE or out of coverage, and the procedure is initiated to release the second hop PC5 Relay RLC channel of an end-to-end sidelink DRB to the connected L2 U2U Remote UE (i.e. Rx UE) according to clause 5.8.9.7.1:

2> set the *SL-RLC-ChannelID* corresponding to the PC5 Relay RLC channel in the *sl-RLC-ChannelToReleaseListPC5*; [RIL]: K001, SLReply

1> if the UE is acting as L2 U2U Remote UE (i.e. Tx UE) and is in RRC\_IDLE or in RRC\_INACTIVE or out of coverage, and if the procedure is initiated to add/modify the first hop PC5 Relay RLC channel of an end-to-end sidelink DRB to the connected L2 U2U Relay UE (i.e. Rx UE), based on configuration in *SIB12* or *SidelinkPreconfigNR*; or

1> if the UE is acting as L2 U2U Relay UE (i.e. Tx UE) and is in RRC\_IDLE or in RRC\_INACTIVE or out of coverage, and if the procedure is initiated to add/modify the second hop PC5 Relay RLC channel to the connected L2 U2U Remote UE (i.e. Rx UE) based on configuration in *SIB12* or *SidelinkPreconfigNR*:

2> if a PC5 Relay RLC channel is to be established:

3> assign a new RLC channel ID and set *sl-RLC-ChannelID-PC5* in the *SL-RLC-ChannelConfigPC5* to include the new RLC channel ID;

3> assign a new logical channel identity for the logical channel to be associated with the PC5 Relay RLC channel and set *sl-MAC-LogicalChannelConfigPC5* in the *SL-RLC-ChannelConfigPC5* to include the new logical channel identity;

2> if the UE is in RRC\_IDLE or in RRC\_INACTIVE:

3> set the *SL-RLC-ChannelConfigPC5* included in the *sl-RLC-ChannelToAddModListPC5* according to the *SL-RLC-BearerConfig* derived based on the per-hop QoS of the end-to-end SLRB according to *sl-RLC-BearerConfigList* in *SIB12*;

2> else if the UE is out of coverage:

3> set the *SL-RLC-ChannelConfigPC5* included in the *sl-RLC-ChannelToAddModListPC5* according to the *SL-RLC-BearerConfig* derived based on the per-hop QoS of the end-to-end SLRB according to *sl-RLC-BearerPreConfigList* in *SidelinkPreconfigNR*.

NOTE 3: Void.

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

##### 5.8.9.1.3 Reception of an *RRCReconfigurationSidelink* by the UE

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

1> if the *RRCReconfigurationSidelink* includes the *sl-ResetConfig*:

2> perform the sidelink reset configuration procedure as specified in 5.8.9.1.10;

1> if the *RRCReconfigurationSidelink* includes the *slrb-ConfigToReleaseList*:

2> for each entryvalue included in the *slrb-ConfigToReleaseList* that is part of the current UE sidelink configuration;

3> perform the sidelink DRB release procedure, according to clause 5.8.9.1a.1;

1> if the *RRCReconfigurationSidelink* includes the *slrb-ConfigToAddModList*:

2> for each *slrb-PC5-ConfigIndex* value included in the *slrb-ConfigToAddModList* that is not part of the current UE sidelink configuration:

3> if *sl-MappedQoS-FlowsToAddList* is included:

4> apply the *SL-PQFI* included in *sl-MappedQoS-FlowsToAddList*;

3> perform the sidelink DRB addition procedure, according to clause 5.8.9.1a.2;

2> for each *slrb-PC5-ConfigIndex* value included in the *slrb-ConfigToAddModList* that is part of the current UE sidelink configuration:

3> if *sl-MappedQoS-FlowsToAddList* is included:

4> add the *SL-PQFI* included in *sl-MappedQoS-FlowsToAddList* to the corresponding sidelink DRB;

3> if *sl-MappedQoS-FlowsToReleaseList* is included:

4> remove the *SL-PQFI* included in *sl-MappedQoS-FlowsToReleaseList* from the corresponding sidelink DRB;

3> if the sidelink DRB release conditions as described in clause 5.8.9.1a.1.1 are met:

4> perform the sidelink DRB release procedure according to clause 5.8.9.1a.1.2;

3> else if the sidelink DRB modification conditions as described in clause 5.8.9.1a.2.1 are met:

4> perform the sidelink DRB modification procedure according to clause 5.8.9.1a.2.2;

1> if the *RRCReconfigurationSidelink* includes the *sl-RLC-BearerToReleaseList*:

2> for each entry value included in the *sl-RLC-BearerToReleaseList* that is part of the current UE sidelink configuration;

3> perform the additional sidelink RLC bearer release procedure, according to clause 5.8.9.1a.5;

1> if the *RRCReconfigurationSidelink* includes the *sl-RLC-BearerToAddModList*:

2> for each *SL-RLC-BearerConfigIndex* value included in the *sl-RLC-BearerToAddModList* that is not part of the current UE sidelink configuration:

3> perform the additional sidelink RLC bearer addition procedure, according to clause 5.8.9.1a.6;

2> for each *SL-RLC-BearerConfigIndex* value included in the *sl-RLC-BearerToAddModList* that is part of the current UE sidelink configuration:

3> perform the additional sidelink RLC bearer modification procedure, according to clause 5.8.9.1a.6;

1> if the *RRCReconfigurationSidelink* includes the *sl-CarrierToReleaseList*:

2> for each entry value included in the *sl-CarrierToReleaseList* that is part of the current UE sidelink configuration;

3> perform the sidelink carrier release procedure, according to clause 5.8.9.1b.1;

1> if the *RRCReconfigurationSidelink* includes the *sl-CarrierToAddModList*:

2> for each *sl-CarrierId* value included in the *sl-CarrierToAddModList* that is not part of the current UE sidelink configuration:

3> perform the sidelink carrier addition procedure, according to clause 5.8.9.1b.2;

1> if the *RRCReconfigurationSidelink* message includes the *sl-MeasConfig*:

2> perform the sidelink measurement configuration procedure as specified in 5.8.10;

1> if the *RRCReconfigurationSidelink* message includes the *sl-CSI-RS-Config*:

2> apply the sidelink CSI-RS configuration;

1> if the *RRCReconfigurationSidelink* message includes the *sl-LatencyBoundCSI-Report*:

2> apply the configured sidelink CSI report latency bound;

1> if the *RRCReconfigurationSidelink* includes the *sl-RLC-ChannelToReleaseListPC5*:

2> for each *SL-RLC-ChannelID* value included in the *sl-RLC-ChannelToReleaseListPC5* that is part of the current UE sidelink configuration;

3> perform the PC5 Relay RLC channel release procedure, according to clause 5.8.9.7.1;

1> if the *RRCReconfigurationSidelink* includes the *sl-RLC-ChannelToAddModListPC5*:

2> for each *sl-RLC-ChannelID-PC5* value included in the *sl-RLC-ChannelToAddModListPC5* that is not part of the current UE sidelink configuration:

3> perform the PC5 Relay RLC channel addition procedure, according to clause 5.8.9.7.2;

2> for each *sl-RLC-ChannelID-PC5* value included in the *sl-RLC-ChannelToAddModListPC5* that is part of the current UE sidelink configuration:

3> perform the PC5 Relay RLC channel modification procedure according to clause 5.8.9.7.2;

1> if the *RRCReconfigurationSidelink* message includes the *sl-DRX-ConfigUC-PC5*; and

1> if the UE accepts the *sl-DRX-ConfigUC-PC5*:

2> configure lower layers to perform sidelink DRX operation according to *sl-DRX-ConfigUC-PC5* for the associated destination as defined in TS 38.321 [3];

1> if the *RRCReconfigurationSidelink* message includes the *sl-LatencyBoundIUC-Report*:

2> apply the configured sidelink IUC report latency bound;

1> if the *RRCReconfigurationSidelink* message includes the *sl-LocalID-PairList*:

2> configure SRAP entity to perform NR sidelink L2 U2U relay operation accordingly for the end-to-end PC5 connection with the peer L2 U2U Remote UE as defined in TS 38.351 [65];

1> if the UE is unable to comply with (part of) the configuration included in the *RRCReconfigurationSidelink* (i.e. sidelink RRC reconfiguration failure):

2> continue using the configuration used prior to the reception of the *RRCReconfigurationSidelink* message;

2> set the content of the *RRCReconfigurationFailureSidelink* message;

3> submit the *RRCReconfigurationFailureSidelink* message to lower layers for transmission;

1> if the *RRCReconfigurationSidelink* message includes the *sl-SFN-DFN-Offset*:

2> if the *sl-SFN-DFN-Offset* is set to *setup*:

3> apply the configured SFN-DFN time offset;

2> if the *sl-SFN-DFN-Offset* is set to *release*:

3> release the received *sl-SFN-DFN-Offset*;

1> else:

2> set the content of the *RRCReconfigurationCompleteSidelink* message;

3> if the UE rejects the sidelink DRX configuration *sl-DRX-ConfigUC-PC5* received from the peer UE:

4> include the *sl-DRX-ConfigReject* in the *RRCReconfigurationCompleteSidelink* message;

4> consider no sidelink DRX to be applied for the corresponding sidelink unicast communication;

3> submit the *RRCReconfigurationCompleteSidelink* message to lower layers for transmission;

NOTE 1: When the same logical channel is configured with different RLC mode by another UE, the UE handles the case as sidelink RRC reconfiguration failure.

NOTE 2: It is up to the UE implementation whether or not to indicate the rejection to the peer UE for a received sidelink DRX configuration.

NOTE 3: When UE transmits SL-PRS in dedicated SL-PRS resource pool, the sidelink DRX configuration is not applied.

=================================NEXT CHANGE=======================================

#### 5.8.9.8 Remote UE information

##### 5.8.9.8.1 General



Figure 5.8.9.8.1-1: Remote UE information

This procedure is used by the L2 U2N Remote UE or L2 Intermediate U2N Relay UE in RRC\_IDLE/RRC\_INACTIVE to inform about the required SIB(s) /posSIB(s), provide Paging related information to the connected parent L2 U2N Relay UE, request the SFN-DFN offset from the connected L2 U2N Relay UE in case of single hop, and trigger L2 U2N Relay UE in RRC\_IDLE/RRC\_INACTIVE to enter RRC\_CONNECTED during indirect path addition/change in MP operation. This procedure is also used by the L2 U2U Remote UE to send end-to-end PC5 connection release/failure related information to L2 U2U Relay UE.

This procedure is used by the L2 U2N Remote UE in RRC\_CONNECTED to request the SFN-DFN offset from the connected L2 U2N Relay UE in case of single hop.

NOTE: MIB is not required by a L2 U2N Remote UE.

##### 5.8.9.8.2 Actions related to transmission of *RemoteUEInformationSidelink* message

When entering RRC\_IDLE or RRC\_INACTIVE, or upon change in any of the information in the *RemoteUEInformationSidelink* while in RRC\_IDLE or RRC\_INACTIVE, the L2 U2N Remote UE or L2 Intermediate U2N Relay UE shall:

1> if the UE has SIB request information to provide (e.g. the UE has not stored a valid version of a SIB, in accordance with clause 5.2.2.2.1, of one or several required SIB(s) in accordance with clause 5.2.2.1 and the requested SIB has not been indicated in *RemoteUEInformationSidelink* message to the parent L2 U2N Relay UE before) [RIL]: X501, SLRelay:

2> include *sl-RequestedSIB-List* in the *RemoteUEInformationSidelink* to indicate the requested SIB(s);

1> if the UE has not stored a valid version, in accordance with clause 5.2.2.2.1, of one or several posSIB(s) that the UE requires for a positioning operation, and the requested posSIB has not been indicated in *RemoteUEInformationSidelink* message to the parent L2 U2N Relay UE before, and the connected parent L2 U2N relay UE set*posSIB-ForwardingSupported* to *supported*:

2> include *sl-RequestedPosSIB-List* in the *RemoteUEInformationSidelink* to indicate the requested posSIB(s);

1> if the UE needs the SFN-DFN offset based on the request from upper layers and the connected L2 U2N relay UE set *sfn-DFN-OffsetSupported* to *supported*:

2> set *sl-SFN-DFN-OffsetRequested* to *true*;

1> if the UE has paging related information to provide (e.g. the UE has not sent *sl-PagingInfo-RemoteUE* in the *RemoteUEInformationSidelink* message to the parent L2 U2N Relay UE before),set *sl-PagingInfo-RemoteUE/ sl-PagingInfo-RemoteUE-List* as follows:

2> if the L2 U2N Remote UE is in RRC\_IDLE:

3> include *ng-5G-S-TMSI* in the *sl-PagingIdentityRemoteUE*;

3> if the UE specific DRX cycle is configured by upper layer, set *sl-PagingCycleRemoteUE* to the value of UE specific Uu DRX cycle configured by upper layer*;*

2> else if the L2 U2N Remote UE is in RRC\_INACTIVE:

3> include *ng-5G-S-TMSI* and *fullI-RNTI* in the *sl-PagingIdentityRemoteUE*;

3> if the UE specific DRX cycle is configured by upper layer,

4> set *sl-PagingCycleRemoteUE* to the minimum value of UE specific Uu DRX cycles (configured by upper layer and configured by RRC)*;*

3> else:

4> set *sl-PagingCycleRemoteUE* to the value of UE specific DRX cycle configured by RRC;

2> if any paging information [RIL]: X502, SLRelay is received from the Child UE:

3> include the received paging information in the *sl-PagingInfo-RemoteUE-List*;

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

When entering RRC\_CONNECTED, if L2 U2N remote UE or L2 Intermediate U2N Relay UE had sent *sl-RequestedSIB-List*, *sl-RequestedPosSIB-List*, and/or *sl-PagingInfo-RemoteUE,* the L2 U2N Remote UE or L2 Intermediate U2N Relay UE shall: [RIL]: K003, SLReply

1> set the *sl-RequestedSIB-List* to the value *release* if requested before;

1> set the *sl-RequestedPosSIB-List* to the value *release* if requested before;

1> set the *sl-PagingInfo-RemoteUE* to the value *release* if sent before;

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

Upon any change in the need of SFN-DFN offset while in RRC\_CONNECTED, the L2 U2N Remote UE shall:

1> if the UE needs the SFN-DFN offset based on the request from upper layers and the connected L2 U2N relay UE set *sfn-DFN-OffsetSupported* to *supported*:

2> set *sl-SFN-DFN-OffsetRequeste*d to *true*;

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

The L2 U2N Remote UE in RRC\_CONNECTED shall:

1> if the UE is configured with *sl-IndirectPathAddChange* set to *setup*, and not configured with split SRB1 with duplication:

2> include *connectionForMP*;

2> submit the *RemoteUEInformationSidelink* message to lower layers for transmission;

The L2 U2U Remote UE shall:

1> upon end-to-end PC5-RRC connection release; or

1> upon end-to-end PC5-RRC connection failure due to T400 expiry or integrity check failure of SL-SRB2 or SL-SRB3:

2> include *sl-DestinationIdentityRemoteUE*;

2> submit the *RemoteUEInformationSidelink* message to lower layers for transmission;

##### 5.8.9.8.3 Reception of *RemoteUEInformationSidelink* message by the L2 U2N /U2U Relay UE

The L2 U2N Relay UE shall: [RIL]: K004, SLReply

1> if the *RemoteUEInformationSidelink* includes the *sl-PagingInfo-RemoteUE*:

2> if the UE is in RRC\_CONNECTED on an active BWP with common search space configured including *pagingSearchSpace*; or

2> if the UE is in RRC\_IDLE or RRC\_INACTIVE:

3> if the *sl-PagingInfo-RemoteUE*[RIL]: Z457, SLRelay is set to *setup*:

4> monitor the *Paging* message at the L2 U2N Remote UE's paging occasion calculated according to *sl-PagingIdentityRemoteUE* and *sl-PagingCycleRemoteUE* included in *sl-PagingInfo-RemoteUE*;

3> else (the *sl-PagingInfo-RemoteUE* is set to *release*):

4> stop monitoring the *Paging* message at the L2 U2N Remote UE's paging occasion;

4> release the received paging information in *sl-PagingInfo-RemoteUE*;

2> else:

3> if the *sl-PagingInfo-RemoteUE* is set to *setup*:

4> include the received *sl-PagingIdentityRemoteUE* in *SidelinkUEInformationNR* message and perform Sidelink UE information transmission in accordance with 5.8.3;

3> else (the *sl-PagingInfo-RemoteUE* is set to *release*):

4> initiate transmission of the *SidelinkUEInformationNR* message to release the *sl-PagingIdentityRemoteUE* in *SidelinkUEInformationNR* message in accordance with 5.8.3;

4> release the received paging information in *sl-PagingInfo-RemoteUE*;

1> if the *RemoteUEInformationSidelink* includes the *sl-RequestedSIB-List*:

2> if the *sl-RequestedSIB-List* is set to *setup*:

3> if the L2 U2N Relay UE has not stored a valid version of SIB(s) indicated in *sl-RequestedSIB-List*:

4> perform acquisition of the system information indicated in *sl-RequestedSIB-List* in accordance with 5.2.2 or 5.8.9.8.2;

3> perform the Uu message transfer procedure in accordance with 5.8.9.9;

2> if the *sl-RequestedSIB-List* is set to *release*:

3> release received SIB request in *sl-RequestedSIB-List*;

1> if the *RemoteUEInformationSidelink* includes the *sl-RequestedPosSIB-List*:

2> if the *sl-RequestedPosSIB-List* is set to setup:

3> if the L2 U2N Relay UE has not stored a valid version of posSIB(s) indicated in *sl-RequestedPosSIB-List*:

4> perform acquisition of the positioning system information indicated in *sl-RequestedPosSIB-List* in accordance with 5.2.2 or 5.8.9.8.2;

3> perform the Uu message transfer procedure in accordance with 5.8.9.9;

2> if the *sl-RequestedPosSIB-List* is set to *release*:

3> release received posSIB request in *sl-RequestedPosSIB-List*.

1> if the *RemoteUEInformationSidelink* includes the *connectionForMP*:

2> if the L2 U2N Relay UE is in RRC\_IDLE:

3> initiate an RRC connection establishment as specified in 5.3.3;

2> else if the L2 U2N Relay UE is in RRC\_INACTIVE:

3> initiate an RRC connection resume as specified in 5.3.13;

The L2 U2U Relay UE shall:

1> if the *RemoteUEInformationSidelink* includes the *sl-DestinationIdentityRemoteUE*:

2> consider the end-to-end PC5 connection release for the end-to-end PC5 connection between the L2 U2U Remote UE and the peer L2 U2U Remote UE identified by *sl-DestinationIdentityRemoteUE*;

2> initiate the end-to-end PC5 connection failure/release related actions as specified in 5.8.9.3b; [RIL]: H451, SLRelay

#### 5.8.9.9 Uu message transfer in sidelink

##### 5.8.9.9.1 General



Figure 5.8.9.9.1-1: Uu message transfer in sidelink

The purpose of this procedure is to transfer *Paging* message and System Information from the L2 U2N Relay UE to the L2 U2N Remote UE (in case of single hop) or to the Child UE (in case of multi hop) in RRC\_IDLE/RRC\_INACTIVE.

##### 5.8.9.9.2 Actions related to transmission of *UuMessageTransferSidelink* message

The L2 U2N Relay UE initiates the Uu message transfer procedure when at least one of the following conditions is met:

1> upon receiving *Paging* message related to the connected L2 U2N Remote UE or the Child UE from network [RIL]: O504, SLRelay (including *Paging* message within *RRCReconfiguration* message);

1> upon acquisition of the SIB(s) requested by the connected L2 U2N Remote UE or by the Child UE (as indicated in *sl-RequestedSIB-List* in the *RemoteUEInformationSidelink*) or upon receiving the updated SIB(s) from network [RIL]: O504, SLRelay which has been requested by the connected L2 U2N Remote UE or by the Child UE;

1> upon acquisition of the posSIB(s) requested by the connected L2 U2N Remote UE or by the Child UE (as indicated in *sl-RequestedPosSIB-List* in the *RemoteUEInformationSidelink*) or upon receiving the updated posSIB(s) from network [RIL]: O504, SLRelay which have been requested by the connected L2 U2N Remote UE or by the Child UE;

1> upon unsolicited SIB1 forwarding to the connected L2 U2N Remote UE or by the Child UE or upon receiving the updated *SIB1* from network [RIL]: O504, SLRelay;

For each associated L2 U2N Remote UE or for each associated Child UE, the L2 U2N Relay UE shall set the contents of *UuMessageTransferSidelink* message as follows:

1> include *sl-PagingDelivery* [RIL]: O505, SLRelay if the *Paging* message received from network [RIL]: O504, SLRelay containing the *ue-Identity* of the L2 U2N Remote UE;

1> include *sl-SIB1-Delivery* if any of the conditions for initiating Uu message transfer procedure related to SIB1 are met;

1> include *sl-SystemInformationDelivery* if any of the conditions for initiating Uu message transfer procedure related to System Information are met;

1> submit the *UuMessageTransferSidelink* message to lower layers for transmission.

NOTE: The L2 U2N Relay UE may perform unsolicited forwarding of SIB1 to the L2 U2N Remote UE or to the Child UE based on UE implementation. A L2 U2N Remote UE configured with MP does not apply the *SIB1* received from the L2 U2N Relay UE on the indirect path, if any.

##### 5.8.9.9.3 Reception of the *UuMessageTransferSidelink by the L2 U2N Remote UE*

Upon receiving the *UuMessageTransferSidelink* message, the L2 U2N Remote UE shall:

1> if *sl-PagingDelivery* is included:

2> perform the paging reception procedure as specified in clause 5.3.2.3;

1> if *sl-SystemInformationDelivery* and/or *sl-SIB1-Delivery* is included:

2> perform the actions specified in clause 5.2.2.4.

##### 5.8.9.9.X Reception of the *UuMessageTransferSidelink* by the L2 Intermediate U2N Relay UE

Upon receiving the *UuMessageTransferSidelink* message from the connected L2 U2N Parent Relay UE, the L2 Intermediate U2N Relay UE shall:

1> if *sl-PagingDelivery* contains the *ue-Identity* of the child UEs:

2> consider the paging message of the child UE is acquired;

1> if *sl-SystemInformationDelivery* requested by the child UEs and/or *sl-SIB1-Delivery* is included:

2> consider the SIB requested by the child UE is acquired; [RIL]: E029, SLRelay

#### 5.8.9.10 Notification Message

##### 5.8.9.10.1 General



Figure 5.8.9.8.1-1: Notification message in sidelink[RIL]: X503, SLRelay

This procedure is used by a U2N Relay UE to send notification to the connected U2N Remote UE or to the connected child UE, or used by a L2 U2U Relay UE to send notification to the L2 U2U Remote UE for an end-to-end PC5 connection when condition(s) as specified in 5.8.9.10.2 is met for the hop between the L2 U2U Relay UE and the peer L2 U2U Remote UE.

##### 5.8.9.10.2 Initiation

The Relay UE may initiate the procedure when one of the following conditions is met:

1> if the UE is acting as U2N Relay UE or [RIL]: O506, SLRelay Last U2N Relay UE:

2> upon Uu RLF as specified in 5.3.10;

2> upon reception of an *RRCReconfiguration* including the *reconfigurationWithSync*;

2> upon cell reselection;

2> upon L2 U2N Relay UE's or Last U2N Relay UE’s RRC connection failure including RRC connection reject as specified in 5.3.3.5 and 5.3.13.10, and T300 expiry as specified in 5.3.3.7, and RRC resume failure as specified in 5.3.13.5;

1> if the UE is acting as Intermediate U2N Relay UE: [RIL]: B100, SLRelay, [RIL]: B101, SLRelay， [RIL]: B102, SLRelay

2> upon relay reselection;

2> upon cell selection;

2> upon PC5 RLF [RIL]: O507, SLRelay with its parent relay UE;

2> upon reception of an *RRCReconfiguration* including the *reconfigurationWithSync*;

2> upon reception of an *NotificationMessageSidelink* from the parent [RIL]: X504, SLRelay [RIL]: O507, SLRelay while in RRC\_CONNECTED;

1> if the UE is acting as L2 U2U Relay UE:

2> upon detection of PC5 RLF for the hop between the L2 U2U Relay UE and L2 U2U Remote UE as specified in 5.8.9.3;

2> upon PC5-RRC connection release for the per-hop link between the L2 U2U Relay UE and L2 U2U Remote UE as specified in 5.8.9.5;

Note 1: The Notification Message may not be sent by an Intermediate U2N relay UE in RRC\_IDLE or RRC\_INACTIVE to its child UEs if the relay reselection or cell selection does not cause the change of the serving cell [RIL]: H454, SLRelay.

##### 5.8.9.10.3 Actions related to transmission of *NotificationMessageSidelink* message

The Relay UE shall set the indication type as follows:

1> if the UE is acting as U2N Relay UE [RIL]: O506, SLRelay or Last U2N Relay UE:

2> if the UE initiates transmission of the *NotificationMessageSidelink* message due to Uu RLF:

3> set the *indicationType* as *relayUE-Uu-RLF*;

2> else if the UE initiates transmission of the *NotificationMessageSidelink* message due to reconfiguration with sync:

3> set the *indicationType* as *relayUE-HO*;

2> else if the UE initiates transmission of the *NotificationMessageSidelink* message due to cell reselection:

3> set the *indicationType* as *relayUE-CellReselection*;

2> if the UE initiates transmission of the *NotificationMessageSidelink* message due to Uu RRC connection establishment/Resume failure:

3> set the *indicationType* as *relayUE-Uu-RRC-Failure*;

1> if the UE is acting as Intermediate U2N Relay UE: [RIL]: B100, SLRelay, [RIL]: B101, SLRelay， [RIL]: B102, SLRelay

2> if the UE initiates transmission of the *NotificationMessageSidelink* message due to relay reselection:

3> set the *indicationType* as *relayUE-RelayReselection*;

2> else if the UE initiates transmission of the *NotificationMessageSidelink* message due to cell selection:

3> set the *indicationType* as *relayUE-CellSelection*;

2> else if the UE initiates transmission of the *NotificationMessageSidelink* message due to PC5 RLF [RIL]: O507, SLRelay with its parent Relay UE:

3> set the *indicationType* as *relayUE-PC5-RLF*;

2> else if the UE initiates transmission of the *NotificationMessageSidelink* message due to reconfiguration with sync:

3> set the *indicationType* as *relayUE-HO*;

2> else if the UE initiates transmission of the *NotificationMessageSidelink* message upon reception of the *NotificationMessageSidelink* message from the parent relay UE:

3> set the *indicationType* as received from the parent relay UE;

2> submit the *NotificationMessageSidelink* message to lower layers for transmission.

1> if the UE is acting as L2 U2U Relay UE:

2> if the UE initiates transmission of the *NotificationMessageSidelink* message due to PC5 RLF with L2 U2U Remote UE; or

2> if the UE initiates transmission of the *NotificationMessageSidelink* message due to PC5-RRC connection release for the per-hop link between the L2 U2U Relay UE and L2 U2U Remote UE:

3> set the *sl-IndicationType* as *relayUE-PC5-RLF*;

3> set the *sl-DestinationIdentityRemoteUE* as the associated destination for L2 U2U Remote UE;

3> submit the *NotificationMessageSidelink* message to lower layers for transmission;

##### 5.8.9.10.4 Actions related to reception of *NotificationMessageSidelink* message

Upon receiving the *NotificationMessageSidelink* [RIL]: K005, SLReply, the Remote UE shall:

1> if the UE is acting as U2N Remote UE:

2> if the *indicationType* is included:

3> if the UE is L2 U2N Remote UE in RRC\_CONNECTED:

4> if MP is configured and MCG transmission (i.e. direct path) is not suspended;

5> if the *indicationType* is *relayUE-HO*;

6> suspend indirect path transmission;

5> else:

6> initiate the indirect path failure information procedure as specified in 5.7.3c to report indirect path failure;

4> else if T301 is not running, initiate the RRC connection re-establishment procedure as specified in 5.3.7;

3> else (the UE is L3 U2N Remote UE, or L2 U2N Remote UE or child UE in RRC\_IDLE or RRC\_INACTIVE):

4> if the PC5-RRC connection with the U2N Relay UE or with the U2N Parent Relay UE is determined to be released:

5> indicate upper layers to trigger PC5 unicast link release;

4> else (i.e., maintain the PC5 RRC connection):

5> if the UE is L2 U2N Remote UE or child UE and the *indicationType* is *relayUE-HO* or *relayUE-CellReselection*:

6> consider cell re-selection occurs;

NOTE 1: For L3 U2N Remote UE, or L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE, it is up to Remote UE implementation whether to release or keep the PC5 unicast link.

NOTE 2: The L2 U2N Remote UE may ignore the *NotificationMessageSidelink* if it does not release the PC5 unicast link in source side yet during an indirect-to-direct path switch, i.e. T304 is running.

1> if the UE is acting as L2 U2U Remote UE:

2> if *sl-IndicationType* is *relayUE-PC5-RLF*:

3> indicate PC5 RLF received from L2 U2U Relay UE to the upper layers for the indicated L2 U2U Remote UE based on the received *sl-DestinationIdentityRemoteUE*;

3> consider the end-to-end PC5 connection failure for the end-to-end PC5 connection(s) over the per-hop PC5 link between the L2 U2U Relay UE and the L2 U2U Remote UE identified by *sl-DestinationIdentityRemoteUE*;

3> perform the end-to-end PC5 connection failure related actions as specified in 5.8.9.3a;

NOTE 3: It is up to the upper layers on whether to trigger U2U Relay reselection and whether to keep or release the PC5 link with the U2U Relay UE after the PC5 RLF indication received from U2U Relay UE.

=================================NEXT CHANGE=======================================

### 5.8.13 NR sidelink discovery

#### 5.8.13.1 General

The purpose of this procedure is to perform NR sidelink discovery as specified in TS 23.304 [65].

#### 5.8.13.2 NR sidelink discovery monitoring

A UE capable of NR sidelink discovery that is configured by upper layers to monitor NR sidelink discovery messages shall:

1> if the frequency used for NR sidelink discovery is included in *sl-FreqInfoToAddModList* in *RRCReconfiguration* message and *sl-DiscConfig* is included in *RRCReconfiguration*; or if the frequency used for NR sidelink discovery is includedin *sl-FreqInfoList* included in *SIB12* and *sl-DiscConfigCommon* is included in *SIB12*:

2> if the UE is configured with *sl-DiscRxPool* for NR sidelink discovery reception included in *RRCReconfiguration* message with *reconfigurationWithSync* (i.e. handover):

3> configure lower layers to monitor sidelink control information and the corresponding data using the resource pool indicated by *sl-DiscRxPool* for NR sidelink discovery reception in *RRCReconfiguration*;

2> else if the UE is configured with *sl-RxPool* for NR sidelink discovery reception included in *RRCReconfiguration* message with *reconfigurationWithSync* (i.e. handover):

3> configure lower layers to monitor sidelink control information and the corresponding data using the resource pool indicated by *sl-RxPool* for NR sidelink discovery reception in *RRCReconfiguration*;

2> else if the cell chosen for NR sidelink discovery reception provides *SIB12*:

3> if *sl-DiscRxPool* for NR sidelink discovery reception is included in *SIB12*:

4> configure lower layers to monitor sidelink control information and the corresponding data using the resource pool indicated by *sl-DiscRxPool* for NR sidelink discovery reception *in SIB12*;

3> else if *sl-RxPool* for NR sidelink discovery reception is included in *SIB12*:

4> configure lower layers to monitor sidelink control information and the corresponding data using the resource pool indicated by *sl-RxPool* for NR sidelink discovery reception *in SIB12*;

1> else:

2> if out of coverage on the concerned frequency for NR sidelink discovery:

3> if *sl-DiscRxPool* was preconfigured:

4> configure lower layers to monitor sidelink control information and the corresponding data using the resource pool that was preconfigured by *sl-DiscRxPool* for NR sidelink discovery reception in *SL-PreconfigurationNR*, asdefined in clause 9.3;

3> else:

4> configure lower layers to monitor sidelink control information and the corresponding data using the resource pool that was preconfigured by *sl-RxPool* for NR sidelink discovery reception in *SL-PreconfigurationNR*, asdefined in clause 9.3;

NOTE: If *sl-DiscRxPool* and *sl-RxPool* are both included in SIB12 or preconfigured, it is up to UE implementation whether to monitor sidelink control information and the corresponding data using the resource pool indicated by *sl-RxPool* for NR sidelink discovery reception.

#### 5.8.13.3 NR sidelink discovery transmission

A UE capable of NR sidelink discovery that is configured by upper layer to transmit NR sidelink discovery message shall [RIL]: O508, SLRelay:

1> if the frequency used for NR sidelink discovery is included in *sl-FreqInfoToAddModList* in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message; or if the frequency used for NR sidelink discovery is includedin *sl-FreqInfoList* within *SIB12*:

2> if the UE is in RRC\_CONNECTED and uses the frequency included in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message:

3> if the UE is acting as NR sidelink U2N Relay UE or Last U2N Relay UE[RIL]: Z459, SLRelay and *sl-DiscConfig* is included in *RRCReconfiguration*, and if the NR sidelink U2N Relay UE or Last U2N Relay UE threshold conditions as specified in 5.8.14.2 are met based on *sl-RelayUE-Config*; or3> if the UE is selecting NR sidelink U2N Relay UE / has a selected NR sidelink U2N Relay UE/ configured with measurement object associated to L2 U2N Relay UEs in both single hop or multi hop case and *sl-DiscConfig* is included in *RRCReconfiguration*, and if the NR sidelink U2N Remote UE threshold conditions as specified in 5.8.15.2 are met based on *sl-RemoteUE-Config*; or

3> if the UE acting as Last U2N Relay UE is sending Discovery Response message with Model B as specified in TS 23.304 [65] and if the NR sidelink multi-hop relay threshold conditions as specified in 5.8.x.2 are met based on *sl-RelayUE-ConfigMH* [RIL]: H452, SLRelay; or

3> if the UE acting as Intermediate U2N Relay UE is sending Discovery Solicitation message with Model B as specified in TS 23.304 [65] and if the NR sidelink multi-hop relay threshold conditions as specified in 5.8.x.2 are met based on *sl-RelayUE-ConfigMH* [RIL]: H452, SLRelay; or [RIL]: H452, SLRelay

3> if the UE is selecting NR sidelink U2U Relay UE / has a selected NR sidelink U2U Relay UE and *sl-DiscConfig* is included in *RRCReconfiguration*, and if the NR sidelink U2U Remote UE threshold conditions associated with the peer NR Sidelink U2U Remote UE as specified in 5.8.17.2 are met based on *sl-RemoteUE-ConfigU2U*; or

3> if the UE acting as Target Remote UE is performing U2U Relay Discovery with Model B and *sl-DiscConfig* is included in *RRCReconfiguration*, and if the NR sidelink U2U Remote UE threshold conditions associated with the NR sidelink U2U Relay UE as specified in 5.8.17.2 are met based on *sl-RemoteUE-ConfigU2U*; or

3> if the UE acting as U2U Relay UE is performing U2U Relay Discovery with Model A as specified in TS 23.304[65], and neighbour UEs in discovery message to be transmitted meet the threshold conditions as specified in 5.8.16.3; or

3> if the UE acting as U2U Relay UE is sending Discovery Response message with Model B as specified in TS 23.304[65]; or

3> if the UE acting as U2U Relay UE is sending Discovery Solicitation message with Model B as specified in TS 23.304[65] and *sl-DiscConfig* is included in *RRCReconfiguration*, and if the NR sidelink U2U Relay UE threshold conditions as specified in 5.8.16.2 are met based on *sl-RelayUE-ConfigU2U*; or

NOTE 1: For U2U Relay UE and Target Remote UE, it can be up to UE implementation on cross-layer interaction for the AS layer condition check for discovery message forwarding.

3> if the UE is performing NR sidelink non-relay discovery:

4> if the UE is configured with *sl-ScheduledConfig*:

5> if T310 for MCG or T311 is running; and if *sl-TxPoolExceptional* is included in *sl-FreqInfoList* for the concerned frequency in *SIB12* or included in *sl-ConfigDedicatedNR* in *RRCReconfiguration*; or

5> if T301 is running and the cell on which the UE initiated RRC connection re-establishment provides *SIB12* including *sl-TxPoolExceptional* for the concerned frequency; or

5> if T304 for MCG is running and the UE is configured with *sl-TxPoolExceptional* included in *sl-ConfigDedicatedNR* for the concerned frequency in *RRCReconfiguration*:

6> configure lower layers to perform the sidelink resource allocation mode 2 based on random selection using the resource pool indicated by *sl-TxPoolExceptional* as defined in TS 38.321 [3] for NR sidelink discovery transmission;

5> else:

6> configure lower layers to perform the sidelink resource allocation mode 1 using the resource pool indicated by *sl-DiscTxPoolScheduling* or *sl-TxPoolScheduling* for NR sidelink discovery transmission on the concerned frequency in *RRCReconfiguration*;

5> if T311 is running, configure the lower layers to release the resources indicated by *rrc-ConfiguredSidelinkGrant* (if any);

4> if the UE is configured with *sl-UE-SelectedConfig*:

5> if the *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency is included in the *sl-ConfigDedicatedNR* within *RRCReconfiguration*, and if a result of full/partial sensing, if selected and is allowed by *sl-AllowedResourceSelectionConfig*, on the resources configured in *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency included in *sl-ConfigDedicatedNR* within *RRCReconfiguration* is not available in accordance with TS 38.214 [19]; or

5> if the *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency is not included in the *sl-ConfigDedicatedNR* within *RRCReconfiguration*, and a result of full/partial sensing, if selected and is allowed by *sl-AllowedResourceSelectionConfig*, on the resources configured in *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission on the concerned frequency included in *sl-ConfigDedicatedNR* within *RRCReconfiguration* is not available in accordance with TS 38.214 [19];

6> if *sl-TxPoolExceptional* for the concerned frequency is included in *RRCReconfiguration*; or

6> if the PCell provides *SIB12* including *sl-TxPoolExceptional* in *sl-FreqInfoList* for the concerned frequency:

7> configure lower layers to perform the sidelink resource allocation mode 2 based on random selection using the resource pool indicated by *sl-TxPoolExceptional* as defined in TS 38.321 [3] for NR sidelink discovery transmission;

5> else, if the *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency is included in the *sl-ConfigDedicatedNR* within *RRCReconfiguration*:

6> configure lower layers to perform the sidelink resource allocation mode 2 based on resource selection operation according to *sl-AllowedResourceSelectionConfig* (as defined in TS 38.321 [3] and TS 38.214 [19]) using the pools of resources indicated by *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency in *RRCReconfiguration*;

5> else, if the *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission on the concerned frequency is included in the *sl-ConfigDedicatedNR* within *RRCReconfiguration*:

6> configure lower layers to perform the sidelink resource allocation mode 2 based on resource selection operation according to *sl-AllowedResourceSelectionConfig* (as defined in TS 38.321 [3] and TS 38.214 [19]) using the pools of resources indicated by *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission on the concerned frequency in *RRCReconfiguration*;

2> else if the cell chosen for NR sidelink discovery transmission provides *SIB12*:

3> if the UE is acting as NR sidelink U2N Relay UE or Last U2N Relay UE and *sl-DiscConfigCommon* is included in *SIB12*, and if the NR sidelink U2N Relay UE or Last U2N Relay UE threshold conditions as specified in 5.8.14.2 are met based on *sl-RelayUE-ConfigCommon* in *SIB12*; or

3> if the UE is selecting NR sidelink U2N Relay UE / has a selected NR sidelink U2N Relay UE in both single hop or multi hop case and *sl-DiscConfigCommon* is included in *SIB12*, and if the NR sidelink U2N Remote UE threshold conditions as specified in 5.8.15.2 are met based on *sl-RemoteUE-ConfigCommon* in *SIB12*; or

3> if the UE acting as Intermediate U2N Relay UE has an established PC5 link with the selected parent U2N Relay UE, and if the NR sidelink U2N Remote UE threshold conditions as specified in 5.8.15.2 are met based on *sl-RemoteUE-ConfigCommon* in *SIB12*; or

3> if the UE acting as Intermediate U2N Relay UE is sending Discovery Solicitation message with Model B as specified in TS 23.304 [65] and *sl-DiscConfigCommon* is included in *SIB12*, and if the NR sidelink multi-hop relay threshold conditions as specified in 5.8.x.2 are met based on *sl-RelayUE-ConfigCommonMH* RIL]: H452, SLRelay; or

3> if the UE acting as Last U2N Relay UE is sending Discovery Response message with Model B as specified in TS 23.304 [65] and *sl-DiscConfigCommon* is included in *SIB12*, and if the NR sidelink multi-hop relay threshold conditions as specified in 5.8.x.2 are met based on *sl-RelayUE-ConfigCommonMH* RIL]: H452, SLRelay; or RIL]: H452, SLRelay

3> if the UE is selecting NR sidelink U2U Relay UE / has a selected NR sidelink U2U Relay UE and *sl-DiscConfigCommon* is included in *SIB12*, and if the NR sidelink U2U Remote UE threshold conditions associated with the peer NR Sidelink U2U Remote UE as specified in 5.8.17.2 are met based on *sl-RemoteUE-ConfigCommonU2U* in *SIB12*; or

3> if the UE acting as Target Remote UE is performing U2U Relay Discovery with Model B and if the NR sidelink U2U Remote UE threshold conditions associated with the NR sidelink U2U Relay UE as specified in 5.8.17.2 are met based on *sl-RemoteUE-ConfigCommonU2U* in *SIB12*; or

3> if the UE acting as U2U Relay UE is performing U2U Relay Discovery with Model A as specified in TS 23.304[65], and neighbor UEs in discovery message to be transmitted meet the threshold conditions as specified in 5.8.16.3; or

3> if the UE acting as U2U Relay UE is sending Discovery Response message with Model B as specified in TS 23.304[65]; or

3> if the UE acting as U2U Relay UE is sending Discovery Solicitation message with Model B as specified in TS 23.304[65] and if the NR sidelink U2U Relay UE threshold conditions as specified in 5.8.16.2 are met based on *sl-RelayUE-ConfigCommonU2U* in *SIB12*; or

3> if the UE is performing NR sidelink non-relay discovery:

4> if *SIB12* includes *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency,and a result of full/partial sensing, if selected and is allowed by *sl-AllowedResourceSelectionConfig*, on the resources configured in the *sl-DiscTxPoolSelected* for NR sidelink discovery transmission is available in accordance with TS 38.214 [19] or random selection, if allowed by *sl-AllowedResourceSelectionConfig*, is selected:

5> configure lower layers to perform the sidelink resource allocation mode 2 based on resource selection operation according to *sl-AllowedResourceSelectionConfig* using the pools of resources indicated by *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency in *SIB12* as defined in TS 38.321 [3];

4> else if *SIB12* includes *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission on the concerned frequency,and a result of full/partial sensing, if selected and is allowed by *sl-AllowedResourceSelectionConfig*, on the resources configured in the *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission is available in accordance with TS 38.214 [19] or random selection, if allowed by *sl-AllowedResourceSelectionConfig*, is selected:

5> configure lower layers to perform the sidelink resource allocation mode 2 based on resource selection operation according to *sl-AllowedResourceSelectionConfig* using the pools of resources indicated by *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission on the concerned frequency in *SIB12* as defined in TS 38.321 [3];

4> else if *SIB12* includes *sl-TxPoolExceptional* for the concerned frequency:

5> from the moment the UE initiates RRC connection establishment or RRC connection resume, until receiving an *RRCReconfiguration* including *sl-ConfigDedicatedNR*, or receiving an *RRCRelease* or an *RRCReject*; or

5> if a result of full/partial sensing, if selected and is allowed by *sl-AllowedResourceSelectionConfig*, on the resources configured in *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency in *SIB12* is not available in accordance with TS 38.214 [19]; or

5> if *sl-DiscTxPoolSelected* for NR sidelink discovery transmission on the concerned frequency is not included in *SIB12* andif a result of full/partial sensing, if selected and is allowed by *sl-AllowedResourceSelectionConfig*, on the resources configured in *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission on the concerned frequency in *SIB12* is not available in accordance with TS 38.214 [19]:

6> configure lower layers to perform the sidelink resource allocation mode 2 based on random selection (as defined in TS 38.321 [3]) using one of the pools of resources indicated by *sl-TxPoolExceptional* for NR sidelink discovery transmission on the concerned frequency;

1> else if out of coverage on the concerned frequency for NR sidelink discovery:

2> if the UE is acting as L3 U2N Relay UE; or

2> if the UE is selecting NR sidelink U2N Relay UE / has a selected NR sidelink U2N Relay UE in both single hop or multi hop case and if the NR sidelink U2N Remote UE threshold conditions as specified in 5.8.15.2 are met based on *sl-PreconfigDiscConfig* in *SidelinkPreconfigNR*; or

2> if the UE acting as Intermediate U2N Relay UE has an established PC5 link with the selected parent U2N Relay UE; or

2> if the UE acting as Intermediate U2N Relay UE is sending Discovery Solicitation message with Model B as specified in TS 23.304 [65] and if the NR sidelink multi-hop relay threshold conditions as specified in 5.8.x.2 are met based on *sl-PreconfigDiscConfig* in *SidelinkPreconfigNR*; or

2> if the UE is selecting NR sidelink U2U Relay UE / has a selected NR sidelink U2U Relay UE and if the NR sidelink U2U Remote UE threshold conditions associated with the peer NR sidelink U2U Remote UE as specified in 5.8.17.2 are met based on *sl-RemoteUE-PreconfigU2U* in *SidelinkPreconfigNR*; or

2> if the UE acting as Target Remote UE is performing U2U Relay Discovery with Model B and if the NR sidelink U2U Remote UE threshold conditions associated with the NR sidelink U2U Relay UE as specified in 5.8.17.2 are met based on *sl-RemoteUE-PreconfigU2U* in *SidelinkPreconfigNR*; or

2> if the UE acting as U2U Relay UE is performing U2U Relay Discovery with Model A as specified in TS 23.304[65], and neighbor UEs in discovery message to be transmitted meet the threshold conditions as specified in 5.8.16.3; or

2> if the UE acting as U2U Relay UE is sending Discovery Response message with Model B as specified in TS 23.304[65]; or

2> if the UE acting as U2U Relay UE is sending Discovery Solicitation message with Model B as specified in TS 23.304[65] and if the NR sidelink U2U Relay UE threshold conditions as specified in 5.8.16.2 are met based on *sl-RelayUE-PreconfigU2U* in *SidelinkPreconfigNR*; or

2> if the UE is performing NR sidelink non-relay discovery:

3> configure lower layers to perform the sidelink resource allocation mode 2 based on resource selection operation according to *sl-AllowedResourceSelectionConfig* (as defined in TS 38.321 [3] and TS 38.214 [19]) using the pools of resources indicated in *sl-DiscTxPoolSelected* or *sl-TxPoolSelectedNormal* for NR sidelink discovery transmission on the concerned frequency in *SidelinkPreconfigNR*.

NOTE 2: It is up to UE implementation to determine, in accordance with TS 38.321[3], which resource pool to use if multiple resource pools are configured, and which resource allocation scheme is used in the AS based on UE capability (for a UE in RRC\_IDLE/RRC\_INACTIVE) and the allowed resource schemes *sl-AllowedResourceSelectionConfig* in the resource pool configuration.

### 5.8.14 NR sidelink U2N Relay UE operation

#### 5.8.14.1 General

This procedure is used by a UE supporting NR sidelink U2N Relay UE operation in case of single hop or by a UE supporting NR sidelink Last U2N Relay UE operation in case of multi hop configured by upper layers to transmit NR sidelink discovery messages to evaluate AS layer conditions.

5.8.14.2 NR sidelink U2N Relay UE threshold conditions

A UE capable of NR sidelink U2N Relay UE [RIL]: O502, SLRelay or Last U2N Relay UE operation shall:

1> if the threshold conditions specified in this clause were previously not met:

2> if *threshHighRelay* is not configured; or the RSRP measurement of the PCell, or the cell on which the UE camps, is below *threshHighRelay* by *hystMaxRelay* if configured; and

2> if *threshLowRelay* is not configured; or the RSRP measurement of the PCell, or the cell on which the UE camps, is above *threshLowRelay* by *hystMinRelay* if configured:

3> consider the threshold conditions to be met (entry);

1> else:

2> if the RSRP measurement of the PCell, or the cell on which the UE camps, is above *threshHighRelay* if configured; or

2> if the RSRP measurement of the PCell, or the cell on which the UE camps, is below *threshLowRelay* if configured;

3> consider the threshold conditions not to be met (leave);

### 5.8.15 NR sidelink U2N Remote UE operation

#### 5.8.15.1 General

This procedure is used by a UE supporting NR sidelink U2N Remote UE operation configured by upper layers to transmit NR sidelink discovery message to evaluate AS layer conditions. The procedure is also used to perform selection and reselection of NR sidelink U2N Relay UE.

#### 5.8.15.2 NR Sidelink U2N Remote UE threshold conditions

A UE capable of NR sidelink U2N Remote UE operation shall:

1> if the threshold conditions specified in this clause were previously not met:

2> if *threshHighRemote* is not configured; or the RSRP measurement of the PCell, or the cell on which the UE camps, is below *threshHighRemote* by *hystMaxRemote* if configured, or

2> if the UE has no serving cell:

3> consider the threshold conditions to be met (entry);

1> else:

2> if the RSRP measurement of the PCell, or the cell on which the UE camps, is above *threshHighRemote* if configured:

3> consider the threshold conditions not to be met (leave);

The L2 U2N Remote UE not configured with MP considers the cell indicated by *sl-ServingCellInfo* in the *SL-AccessInfo-L2U2N-r17* received from the connected L2 U2N Relay UE as the PCell/camping cell.

NOTE X First U2N Relay UE and Intermediate U2N Relay UE first connects to the network via the parent U2N Relay UE(s) acting as a U2N Remote UE after checking the Remote UE threshold conditions above

#### 5.8.15.3 Selection and reselection of NR sidelink U2N Relay UE

A UE capable of NR sidelink U2N Remote UE operation that is configured by upper layers to search for a NR sidelink U2N Relay UE shall:

1> if the UE has no serving cell; or

1> if the RSRP measurement of the cell on which the UE camps (for L2 and L3 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE)/ the PCell (for L3 U2N Remote UE in RRC\_CONNECTED) is below *threshHighRemote* within *sl-RemoteUE-ConfigCommon*/*sl-RemoteUE-Config*:

2> if the UE does not have a selected NR sidelink U2N Relay UE; or

2> if the UE has a selected NR sidelink U2N Relay UE, and SL-RSRP of the currently selected NR sidelink U2N Relay UE is available and is below *sl-RSRP-Thresh*; or

2> if the UE has a selected NR sidelink U2N Relay UE, and SL-RSRP of the currently selected NR sidelink U2N Relay UE is not available, and SD-RSRP of the currently selected U2N Relay UE is below *sl-RSRP-Thresh*; or

NOTE 1: U2N Remote UE uses SL-RSRP measurements for relay reselection trigger evaluation when there is data transmission from U2N Relay UE to U2N Remote UE, and it is left to UE implementation whether to use SL-RSRP or SD-RSRP for relay reselection trigger evaluation in case of no data transmission from U2N Relay UE to U2N Remote UE. If SD-RSRP is used, the discovery procedure will be performed between the U2N Remote UE and the selected U2N Relay UE.

2> if the UE has a selected NR sidelink U2N Relay UE, and upper layers indicate not to use the currently selected NR sidelink U2N Relay UE; or

2> if the UE has a selected NR sidelink U2N Relay UE, and upper layers request the release of the PC5-RRC connection; or

2> if the UE has a selected NR sidelink U2N Relay UE, and sidelink radio link failure is detected on the PC5-RRC connection with the current U2N Relay UE as specified in clause 5.8.9.3:

3> perform NR sidelink discovery procedure as specified in clause 5.8.13 in order to search for candidate NR sidelink U2N Relay UEs:

4> when evaluating the one or more detected NR sidelink U2N Relay UEs, apply layer 3 filtering as specified in 5.5.3.2 across measurements that concern the same U2N Relay UE ID and using the *sl-FilterCoefficientRSRP* in *SIB12* (if in RRC\_IDLE/INACTIVE), the *sl-FilterCoefficientRSRP* in *sl-ConfigDedicatedNR* (if in RRC\_CONNECTED) or the *sl-FilterCoefficientRSRP* in *SidelinkPreconfigNR* (out of coverage), before using the SD-RSRP measurement results;

4> consider a candidate NR sidelink U2N Relay UE for which SD-RSRP exceeds *sl-RSRP-Thresh* by *sl-HystMin* has met the AS criteria;

3> if the UE detects any suitable NR sidelink U2N Relay UE(s):

4> consider one of the available suitable NR sidelink U2N relay UE(s) can be selected;

NOTE 2: A candidate NR sidelink U2N Relay UE which meets all AS layer criteria defined in 5.8.15.3 and higher layer criteria defined in TS 23.304 [65] can be regarded as suitable NR sidelink U2N Relay UE by the NR sidelink U2N Remote UE. If multiple suitable NR sidelink U2N Relay UEs are available, it is up to Remote UE implementation to choose one NR sidelink U2N Relay UE. The details of the interaction with upper layers are up to UE implementation.

NOTE 3: For L2 U2N Remote UEs in RRC\_IDLE/INACTIVE and L3 U2N Remote UEs, the cell (re)selection procedure and relay (re)selection procedure run independently. If both suitable cells and suitable NR sidelink U2N Relay UEs are available, it is up to NR sidelink U2N Remote UE implementation to select either a cell or a NR sidelink U2N Relay UE. Furthermore, L3 U2N Remote UE's selection on both cell and NR sidelink U2N Relay UE is also based on UE implementation.

NOTE X[RIL]: E044, SLRelay: The L2 U2N Remote UE may prioritize the selection or reselection of suitable NR sidelink U2N Relay UE based on any information available in the discovery message including the RRC State information[RIL]: E046, SLRelay . The RRC State information in the discovery message RRC container reflects the state of the UE that sends the discovery message.

3> else:

4> consider no NR sidelink U2N Relay UE to be selected.

When evaluating the currently selected NR sidelink U2N Relay UE, the U2N Remote UE should apply layer 3 filtering as specified in 5.5.3.2 using the *sl-FilterCoefficientRSRP* in *SIB12* (if in RRC\_IDLE/INACTIVE), the *sl-FilterCoefficientRSRP* in *sl-ConfigDedicatedNR* (if in RRC\_CONNECTED) or the *sl-FilterCoefficientRSRP* in *SidelinkPreconfigNR* (out of coverage), before using the SL-RSRP or SD-RSRP measurement results.

### 5.8.16 NR sidelink U2U Relay UE operation

#### 5.8.16.1 General

This procedure is used by a UE supporting NR sidelink U2U Relay UE operation configured by upper layers to forward NR sidelink integrated discovery messages or Model B Discovery messages to evaluate AS layer conditions. The procedure is also used to determine whether a NR sidelink UE is in proximity to NR sidelink U2U Relay UE in Model A Discovery messages.

#### 5.8.16.2 NR sidelink U2U Relay UE threshold conditions

A UE capable of NR sidelink U2U Relay UE operation shall:

1> if the threshold conditions for sending Direct Communication Request message with integrated Discovery specified in this clause were previously not met:

2> if the *sd-RSRP-ThreshDiscConfig* is not configured, or if the SL-RSRP of the Direct Communication Request message with integrated Discovery received from the Source NR sidelink U2U Remote UE is available and is above *sd-RSRP-ThreshDiscConfig* if configured:

3> consider the threshold conditions to be met (entry);

1> else:

2> if the SL-RSRP of the Direct Communication Request message with integrated Discovery received from the Source NR sidelink U2U Remote UE is available and is below *sd-RSRP-ThreshDiscConfig* by *sd-hystMaxRelay* if configured:

3> consider the threshold conditions not to be met (leave);

1> if the threshold conditions for sending Relay Discovery Solicitation message with Model B Discovery specified in this clause were previously not met:

2> if the *sd-RSRP-ThreshDiscConfig* is not configured, or if the SD-RSRP of the Model B Discovery message received from the Source NR sidelink U2U Remote UE is available and is above *sd-RSRP-ThreshDiscConfig* if configured:

3> consider the threshold conditions to be met (entry);

1> else:

2> if the SD-RSRP of the Model B Discovery message received from the Source NR sidelink U2U Remote UE is available and is below *sd-RSRP-ThreshDiscConfig* by *sd-hystMaxRelay* if configured:

3> consider the threshold conditions not to be met (leave);

When evaluating the Source NR sidelink U2U Remote UE, the U2U Relay UE shall apply layer 3 filtering as specified in 5.5.3.2 using the *sd-FilterCoefficientU2U* in *SL-RelayUE-ConfigU2U* if provided, before using the SL-RSRP or SD-RSRP measurement results.

#### 5.8.16.3 Neighbor UE(s) in proximity conditions

A UE capable of NR sidelink U2U Relay UE operation and is performing U2U Relay Discovery with Model A as specified in TS 23.304[65] shall:

1> for each of potential neighbor UE(s):

2> if the SL-RSRP of the UE is available and is above *sl-RSRP-Thresh-DiscConfig* if configured; or

2> if the SD-RSRP of the UE is available and is above *sd-RSRP-ThreshDiscConfig* if configured:

3> consider the UE as neighbor UE in discovery message to be transmitted as defined in TS 23.304 [65].

NOTE: The interaction with upper layers is left to UE implementation.

When evaluating the potential neighbor UE(s), the U2U Relay UE shall apply layer 3 filtering as specified in 5.5.3.2 using the *sl-FilterCoefficientU2U* or *sd-FilterCoefficientU2U* in *SL-RelayUE-ConfigU2U* if provided, before using the SL-RSRP or SD-RSRP measurement results respectively.

### 5.8.17 NR sidelink U2U Remote UE operation

#### 5.8.17.1 General

This procedure is used by a UE supporting NR sidelink U2U Remote UE operation configured by upper layers to transmit NR sidelink discovery messages to evaluate AS layer conditions. The procedure is also used to perform selection and reselection of NR sidelink U2U Relay UE.

#### 5.8.17.2 NR Sidelink U2U Remote UE threshold conditions

A UE capable of NR sidelink U2U Remote UE operation shall:

1> if the threshold conditions for sending Relay Discovery Solicitation message with Model B or sending Direct Communication Request message with integrated Discovery specified in this clause were previously not met:

2> if the SL-RSRP measurement of the peer NR sidelink U2U Remote UE is to be used, and if *sl-RSRP-ThreshU2U* is not configured, or the SL-RSRP measurement of the peer NR sidelink U2U Remote UE is below *sl-RSRP-ThreshU2U* by *sl-HystMinU2U* if configured; or

2> if the SD-RSRP measurement of the peer NR sidelink U2U Remote UE is to be used, and if *sd-RSRP-ThreshU2U* is not configured, or the SD-RSRP measurement of the peer NR sidelink U2U Remote UE is below *sd-RSRP-ThreshU2U* by *sd-HystMinU2U* if configured; or

2> if the peer NR sidelink U2U Remote UE is not reachable, i.e. SL-RSRP/SD-RSRP measurement of the peer sidelink U2U Remote UE is not available:

3> consider the threshold conditions to be met (entry);

1> else:

2> if the SL-RSRP measurement of the peer NR sidelink U2U Remote UE is available and is above *sl-RSRP-ThreshU2U* if configured; or

2> if the SD-RSRP measurement of the peer NR sidelink U2U Remote UE is available and is above *sd-RSRP-ThreshU2U* if configured:

3> consider the threshold conditions not to be met (leave);

1> if the threshold conditions for sending Relay Discovery Response message with Model B specified in this clause were previously not met:

2> if the *sd-RSRP-ThreshU2U* is not configured, or if the SD-RSRP of the NR sidelink U2U Relay UE is available and is above *sd-RSRP-ThreshU2U* if configured:

3> consider the threshold conditions to be met (entry);

1> else:

2> if the SD-RSRP of the NR sidelink U2U Relay UE is available and is below *sd-RSRP-ThreshU2U* by *sd-HystMinU2U* if configured:

3> consider the threshold conditions not to be met (leave);

When evaluating the peer NR sidelink U2U Remote UE, the U2U Remote UE shall apply layer 3 filtering as specified in 5.5.3.2 using the *sl-FilterCoefficientU2U* or *sd-FilterCoefficientU2U* in *SL-RemoteUE-ConfigU2U* if provided, before using the SL-RSRP or SD-RSRP measurement results respectively.

#### 5.8.17.3 Conditions for selection and reselection of NR sidelink U2U Relay UE

A UE capable of NR sidelink U2U Remote UE operation initiates NR sidelink U2U Relay (re)selection procedure as specified in 5.8.17.4 when one of the following conditions is met:

1> if the UE does not have a selected NR sidelink U2U Relay UE:

2> if configured by upper layers to search for or select a NR sidelink U2U Relay UE; or

2> if *sl-RSRP-ThreshU2U* is not configured, or if the SL-RSRP measurement of the peer NR sidelink U2U Remote UE is available and is below *sl-RSRP-ThreshU2U* by *sl-HystMinU2U* if configured; or

2> if *sd-RSRP-ThreshU2U* is not configured, or if the SD-RSRP measurement of the peer NR sidelink U2U Remote UE is available and is below *sd-RSRP-ThreshU2U* by *sd-HystMinU2U* if configured;

1> else if the UE has a selected NR sidelink U2U Relay UE:

2> if the SL-RSRP of the currently selected NR sidelink U2U Relay UE is available and is below *sl-RSRP-ThreshU2U* by *sl-HystMinU2U* within *sl-RemoteUE-ConfigU2U* if configured; or

2> if the SD-RSRP of the currently selected NR sidelink U2U Relay UE is available, and is below *sd-RSRP-ThreshU2U* by *sd-HystMinU2U* within *sl-RemoteUE-ConfigU2U* if configured; or

NOTE: For relay selection, U2U Remote UE uses SL-RSRP measurements for relay selection trigger evaluation when there is data transmission from peer U2U Remote UE to U2U Remote UE. For relay reselection, U2U Remote UE uses SL-RSRP measurements for relay reselection trigger evaluation when there is data transmission from U2U Relay UE to U2U Remote UE. And in both cases, it is left to UE implementation whether to use SL-RSRP or SD-RSRP for relay (re)selection trigger evaluation in case of no data transmission.

2> if the upper layers indicate to (re)select another NR sidelink U2U Relay UE; or

2> if the sidelink radio link failure is detected on the PC5-RRC connection with the current NR sidelink U2U Relay UE as specified in clause 5.8.9.3.

When evaluating the currently selected NR sidelink U2U Relay UE, the U2U Remote UE shall apply layer 3 filtering as specified in 5.5.3.2 using the *sl-FilterCoefficientU2U* or *sd-FilterCoefficientU2U* in *SL-RemoteUE-ConfigU2U* if provided, before using the SL-RSRP or SD-RSRP measurement results respectively.

#### 5.8.17.4 Actions related to selection and reselection of NR sidelink U2U Relay UE

Upon initiation of the NR sidelink U2U Relay (re)selection procedure, the UE shall:

1> perform NR sidelink discovery procedure as specified in clause 5.8.13 or U2U Relay Communication with integrated Discovery as specified in clause 5.8.8, in order to search for candidate NR sidelink U2U Relay UEs:

2> if the UE is performing NR sidelink discovery procedure as specified in clause 5.8.13:

3> when evaluating the one or more detected NR sidelink U2U Relay UEs, apply layer 3 filtering as specified in 5.5.3.2 across measurements that concern the same U2U Relay UE ID and using the *sd-FilterCoefficientU2U* in *SIB12* (if in RRC\_IDLE/INACTIVE), the *sd-FilterCoefficientU2U* in *sl-ConfigDedicatedNR* (if in RRC\_CONNECTED) or the preconfigured *sd-FilterCoefficientU2U* as defined in 9.3 (out of coverage), before using the SD-RSRP measurement results;

3> consider a candidate NR sidelink U2U Relay UE for which SD-RSRP exceeds *sd-RSRP-ThreshU2U* has met the AS criteria;

2> if the UE is performing U2U Relay Communication with integrated Discovery as specified in TS 23.304 [65] and has received Direct Communication Request message(s) from one or multiple NR sidelink U2U Relay UEs:

3> when evaluating the NR sidelink U2U Relay UE(s), apply layer 3 filtering as specified in 5.5.3.2 across measurements that concern the same U2U Relay UE ID and using the *sd-FilterCoefficientU2U* in *SIB12* (if in RRC\_IDLE/INACTIVE), the *sd-FilterCoefficientU2U* in *sl-ConfigDedicatedNR* (if in RRC\_CONNECTED) or the preconfigured *sd-FilterCoefficientU2U* as defined in 9.3 (out of coverage), before using the SL-RSRP measurement results;

3> consider a candidate NR sidelink U2U Relay UE for which SL-RSRP exceeds *sd-RSRP-ThreshU2U* has met the AS criteria;

1> if the UE detects any suitable NR sidelink U2U Relay UE(s):

2> consider one of the available suitable NR sidelink U2U Relay UE(s) can be selected;

1> else:

2> consider no NR sidelink U2U Relay UE to be selected.

NOTE: A candidate NR sidelink U2U Relay UE which meets all AS layer criteria defined in 5.8.17.4 and higher layer criteria defined in TS 23.304 [65] can be regarded as suitable NR sidelink U2U Relay UE by the NR sidelink U2U Remote UE. If multiple suitable NR sidelink U2U Relay UEs are available, it is up to Remote UE implementation to choose one NR sidelink U2U Relay UE. The details of the interaction with upper layers are up to UE implementation.

### 5.8.18 NR sidelink positioning

#### 5.8.18.1 General

The purpose of this procedure is to perform NR sidelink positioning as specified in TS 38.305 [73].

#### 5.8.18.2 NR sidelink positioning measurement

A UE capable of NR sidelink positioning that is configured by upper layers for performing SL-PRS measurement:

1> if the conditions for NR sidelink positioning operation as defined in 5.8.2 are met:

2> if the frequency used for NR sidelink positioning is included in *sl-FreqInfoToAddModList/sl-FreqInfoToAddModListExt* in *RRCReconfiguration* message or *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* included in *SIB12* and/or *sl-PosFreqInfoList* included in *SIB23*:

3> if the UE is configured with *sl-RxPool* and/or *sl-PRS-RxPool* included in *RRCReconfiguration* message with *reconfigurationWithSync* (i.e. handover):

4> configure lower layers to monitor sidelink control information and the corresponding SL-PRS using the pool(s) of resources indicated by *sl-RxPool* and/or *sl-PRS-RxPool*;

3> else if the cell chosen for NR sidelink positioning provides *SIB12* and/or *SIB23*:

4> configure lower layers to monitor sidelink control information and the corresponding SL-PRS using the pool(s) of resources indicated by *sl-RxPool* in *SIB12* and/or *sl-PRS-RxPool in SIB23*;

2> else:

3> configure lower layers to monitor sidelink control information and the corresponding SL-PRS using the pool(s) of resources that were preconfigured by *sl-RxPool* and/or *sl-PRS-RxPool* in *SL-PreconfigurationNR*, asdefined in clause 9.3.

#### 5.8.18.3 NR sidelink positioning transmission

A UE capable of NR sidelink positioning that is configured by upper layers to transmit SL-PRS shall:

1> if the conditions for NR sidelink positioning operation as defined in 5.8.2 are met:

2> if the frequency used for NR sidelink positioning is included in *sl-FreqInfoToAddModList/sl-FreqInfoToAddModListExt* in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message or includedin *sl-PosConfigCommonNR* within *SIB23* or includedin *sl-ConfigCommonNR* *or sl-FreqInfoListSizeExt* within *SIB12*:

3> if the UE is in RRC\_CONNECTED and uses the frequency included in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message:

4> if the UE is configured with *sl-ScheduledConfig*:

5> if T310 for MCG or T311 is running; and if *sl-PRS-TxPoolExceptional* or *sl-TxPoolExceptional* is included in *sl-PosFreqInfoList* or *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* for the concerned frequency in *SIB23* or *SIB12* or included in *sl-ConfigDedicatedNR* in *RRCReconfiguration*; or

5> if T301 is running and the cell on which the UE initiated RRC connection re-establishment provides *SIB23* or *SIB12* including *sl-PRS-TxPoolExceptional* or *sl-TxPoolExceptional* for the concerned frequency; or

5> if T304 for MCG is running and the UE is configured with *sl-PRS-TxPoolExceptional* or *sl-TxPoolExceptional* included in *sl-ConfigDedicatedNR* for the concerned frequency in *RRCReconfiguration*:

6> configure lower layers to perform the sidelink resource allocation scheme 2 based on random selection using the resource pool indicated by *sl-PRS-TxPoolExceptional* or *sl-TxPoolExceptional* as defined in TS 38.321 [3];

5> else:

6> configure lower layers to perform the sidelink resource allocation scheme 1 for NR sidelink positioning;

5> if T311 is running, configure the lower layers to release the resources indicated by *rrc-ConfiguredSidelinkGrant* (if any);

4> if the UE is configured with *sl-UE-SelectedConfig*:

5> if a result of full sensing, if selected and is allowed by *sl-PosAllowedResourceSelectionConfig*, on the resources configured in *sl-PRS-TxPoolSelectedNormal* or by *sl-AllowedResourceSelectionConfig*, on the resources configured in *sl-TxPoolSelectedNormal* for the concerned frequency included in *sl-ConfigDedicatedNR* within *RRCReconfiguration* is not available in accordance with TS 38.214 [19];

6> if *sl-TxPoolExceptional* or *sl-PRS-TxPoolExceptional* for the concerned frequency is included in RRCReconfiguration; or

6> if the PCell provides *SIB12* and/or *SIB23* including *sl-TxPoolExceptional* or *sl-PRS-TxPoolExceptional* in *sl-FreqInfoList*/*sl-FreqInfoListSizeExt* or *sl-PosFreqInfoList* for the concerned frequency:

7> configure lower layers to perform the sidelink resource allocation scheme 2 based on random selection using the pool of resources indicated by *sl-TxPoolExceptional* or *sl-PRS-TxPoolExceptional* as defined in TS 38.321 [3];

5> else, if the *sl-PRS-TxPoolSelectedNormal* or *sl-TxPoolSelectedNormal* for the concerned frequency is included in the *sl-ConfigDedicatedNR* within *RRCReconfiguration*:

6> configure lower layers to perform the sidelink resource allocation scheme 2 based on resource selection operation according to *sl-PosAllowedResourceSelectionConfig* (as defined in TS 38.321 [3] and TS 38.214 [19]) using the pools of resources indicated by *sl-PRS-TxPoolSelectedNormal* for the concerned frequency, or based on resource selection operation according to *sl-AllowedResourceSelectionConfig* (as defined in TS 38.321 [3] and TS 38.214 [19]) using the pools of resources indicated by *sl-TxPoolSelectedNormal* for the concerned frequency;

3> else:

4> if the cell chosen for NR sidelink positioning transmission provides *SIB23* or *SIB12*:

5> if *SIB23* includes *sl-PRS-TxPoolSelectedNormal* for the concerned frequency,and a result of full sensing, if selected and is allowed by *sl-PosAllowedResourceSelectionConfig*, on the resources configured in the *sl-PRS-TxPoolSelectedNormal* is available in accordance with TS 38.214 [19] or random selection, if allowed by *sl-PosAllowedResourceSelectionConfig*, is selected:

6> configure lower layers to perform the sidelink resource allocation scheme 2 based on resource selection operation according to *sl-PosAllowedResourceSelectionConfig* using the pools of resources indicated by *sl-PosTxPoolSelectedNormal* for the concerned frequency as defined in TS 38.321 [3];

5> if *SIB12* includes *sl-TxPoolSelectedNormal* for the concerned frequency,and a result of full sensing, if selected and is allowed by *sl-AllowedResourceSelectionConfig*, on the resources configured in the *sl-TxPoolSelectedNormal* is available in accordance with TS 38.214 [19] or random selection, if allowed by *sl-AllowedResourceSelectionConfig*, is selected:

6> configure lower layers to perform the sidelink resource allocation scheme 2 based on resource selection operation according to *sl-AllowedResourceSelectionConfig* using the pools of resources indicated by *sl-TxPoolSelectedNormal* for the concerned frequency as defined in TS 38.321 [3];

5> else if *SIB23* includes *sl-PRS-TxPoolExceptional* or *SIB12* includes *sl-TxPoolExceptional* for the concerned frequency:

6> from the moment the UE initiates RRC connection establishment or RRC connection resume, until receiving an *RRCReconfiguration* including *sl-ConfigDedicatedNR*, or receiving an *RRCRelease* or an *RRCReject*; or

6> if a result of full sensing, if selected and is allowed by *sl-PosAllowedResourceSelectionConfig*, on the resources configured in *sl-PRS-TxPoolSelectedNormal* orif selected and is allowed by *sl-AllowedResourceSelectionConfig*, on the resources configured in *sl-TxPoolSelectedNormal* for the concerned frequency in *SIB12* and/or *SIB23* is not available in accordance with TS 38.214 [19]:

7> configure lower layers to perform the sidelink resource allocation scheme 2 based on random selection (as defined in TS 38.321 [3]) using the pool of resources indicated by *sl-PRS-TxPoolExceptional* or *sl-TxPoolExceptional* for the concerned frequency;

2> else:

3> configure lower layers to perform the sidelink resource allocation scheme 2 based on resource selection operation according to *sl-PosAllowedResourceSelectionConfig* or *sl-AllowedResourceSelectionConfig* (as defined in TS 38.321 [3] and TS 38.214 [19]) using the pools of resources indicated by *sl-PRS-TxPoolSelectedNormal or sl-TxPoolSelectedNormal* in *SL-PreconfigurationNR* for the concerned frequency.

NOTE: Void.

NOTE 1: The UE continues to use resources configured in *rrc-ConfiguredSidelinkGrant* (while T310 is running) until it is released (i.e. until T310 has expired). The UE does not use sidelink configured grant type 2 resources while T310 is running.

NOTE 2: In case of RRC reconfiguration with sync, the UE uses resources configured in *rrc-ConfiguredSidelinkGrant* (while T304 on the MCG is running) if provided by the target cell.

NOTE 3: It is up to UE implementation to determine, in accordance with TS 38.321[3], which resource pool to use if multiple resource pools are configured, and which resource allocation scheme is used in the AS based on UE capability (for a UE in RRC\_IDLE/RRC\_INACTIVE) and the allowed resource schemes *sl-PosAllowedResourceSelectionConfig* or *sl-AllowedResourceSelectionConfig* in the resource pool configuration.

=================================NEXT CHANGE=======================================

### 5.8.XX NR sidelink multi-hop U2N Relay UE operation

#### 5.8.XX.1 General

This procedure is used by a UE supporting NR sidelink U2N Relay UE operation in case of multi hop configured by upper layers to transmit NR sidelink discovery messages to evaluate AS layer conditions.

5.8.XX.2 NR sidelink U2N Relay UE threshold conditions

A UE capable of NR sidelink U2N Relay UE as an Last U2N Relay UE operation and is not having the PC5 connection with the Candidate Child UE shall:

1> if the threshold conditions for sending the Discovery Solicitation [RIL]: O509, SLRelay Response message with Model B Discovery specified in this clause were previously not met:

2> if *sd-RSRP-ThreshDiscConfigMH* is not configured; or the SD-RSRP of the Model B Discovery message received from the Candidate Child UE is available and is above the *sd-RSRP-ThreshDiscConfigMH* by *sd-hystMaxRelayMH* if configured;

3> consider the threshold conditions to be met (entry);

1> else:

2> if the SD-RSRP of the Model B Discovery message received from the Candidate Child UE is available and is below the *sd-RSRP-ThreshDiscConfigMH* by *sd-hystMaxRelayMH* if configured;

3> consider the threshold conditions not to be met (leave);

[RIL]: Z458, SLRelay

A UE capable of NR sidelink U2N Relay UE as an Intermediate U2N Relay UE operation and has not established the PC5 connection with its Parent UE shall:

1> if the threshold conditions for sending the Discovery Solicitation message with Model B Discovery specified in this clause were previously not met:

2> if *sd-RSRP-ThreshDiscConfigMH* is not configured; or the SD-RSRP of the Model B Discovery message received from the Candidate Child UE is available and is above the *sd-RSRP-ThreshDiscConfigMH* by *sd-hystMaxRelayMH* if configured;

3> consider the threshold conditions to be met (entry);

1> else:

2> if the SD-RSRP of the Model B Discovery message received from the Candidate Child UE is available and is below the *sd-RSRP-ThreshDiscConfigMH* by *sd-hystMaxRelayMH* if configured;

3> consider the threshold conditions not to be met (leave);

=================================NEXT CHANGE=======================================

### 

### 6.2.2 Message definitions

=================================NEXT CHANGE=======================================

#### – *RRCReestablishment*

The *RRCReestablishment* message is used to re-establish SRB1.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*RRCReestablishment* message

-- ASN1START

-- TAG-RRCREESTABLISHMENT-START

RRCReestablishment ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReestablishment RRCReestablishment-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReestablishment-IEs ::= SEQUENCE {

nextHopChainingCount NextHopChainingCount,

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCReestablishment-v1700-IEs OPTIONAL

}

RRCReestablishment-v1700-IEs ::= SEQUENCE {

sl-L2RemoteUE-Config-r17 SetupRelease {SL-L2RemoteUE-Config-r17} OPTIONAL, -- Cond L2RemoteUE

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-RRCREESTABLISHMENT-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReestablishment-IEs* field descriptions |
| ***sl-L2RemoteUE-Config***  Contains dedicated configurations used for single hop or multi hop L2 U2N relay related operation. The network configures only the SRAP configuration for local UE ID. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RemoteUE* | The field is mandatory present for L2 U2N Remote UE; otherwise it is absent. |

=================================NEXT CHANGE=======================================

#### – *RRCReconfiguration*

The *RRCReconfiguration* message is the command to modify an RRC connection. It may convey information for measurement configuration, mobility control, radio resource configuration (including RBs, MAC main configuration and physical channel configuration) and AS security configuration.

Signalling radio bearer: SRB1 or SRB3

RLC-SAP: AM

Logical channel: DCCH

Direction: Network to UE

*RRCReconfiguration message*

-- ASN1START

-- TAG-RRCRECONFIGURATION-START

RRCReconfiguration ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

rrcReconfiguration RRCReconfiguration-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RRCReconfiguration-IEs ::= SEQUENCE {

radioBearerConfig RadioBearerConfig OPTIONAL, -- Need M

secondaryCellGroup OCTET STRING (CONTAINING CellGroupConfig) OPTIONAL, -- Cond SCG

measConfig MeasConfig OPTIONAL, -- Need M

lateNonCriticalExtension OCTET STRING (CONTAINING RRCReconfiguration-v15t0-IEs) OPTIONAL,

nonCriticalExtension RRCReconfiguration-v1530-IEs OPTIONAL

}

-- Regular non-critical extensions:

RRCReconfiguration-v1530-IEs ::= SEQUENCE {

masterCellGroup OCTET STRING (CONTAINING CellGroupConfig) OPTIONAL, -- Need M

fullConfig ENUMERATED {true} OPTIONAL, -- Cond FullConfig

dedicatedNAS-MessageList SEQUENCE (SIZE(1..maxDRB)) OF DedicatedNAS-Message OPTIONAL, -- Cond nonHO

masterKeyUpdate MasterKeyUpdate OPTIONAL, -- Cond MasterKeyChange

dedicatedSIB1-Delivery OCTET STRING (CONTAINING SIB1) OPTIONAL, -- Need N

dedicatedSystemInformationDelivery OCTET STRING (CONTAINING SystemInformation) OPTIONAL, -- Need N

otherConfig OtherConfig OPTIONAL, -- Need M

nonCriticalExtension RRCReconfiguration-v1540-IEs OPTIONAL

}

RRCReconfiguration-v1540-IEs ::= SEQUENCE {

otherConfig-v1540 OtherConfig-v1540 OPTIONAL, -- Need M

nonCriticalExtension RRCReconfiguration-v1560-IEs OPTIONAL

}

RRCReconfiguration-v1560-IEs ::= SEQUENCE {

mrdc-SecondaryCellGroupConfig SetupRelease { MRDC-SecondaryCellGroupConfig } OPTIONAL, -- Need M

radioBearerConfig2 OCTET STRING (CONTAINING RadioBearerConfig) OPTIONAL, -- Need M

sk-Counter SK-Counter OPTIONAL, -- Need N

nonCriticalExtension RRCReconfiguration-v1610-IEs OPTIONAL

}

RRCReconfiguration-v1610-IEs ::= SEQUENCE {

otherConfig-v1610 OtherConfig-v1610 OPTIONAL, -- Need M

bap-Config-r16 SetupRelease { BAP-Config-r16 } OPTIONAL, -- Need M

iab-IP-AddressConfigurationList-r16 IAB-IP-AddressConfigurationList-r16 OPTIONAL, -- Need M

conditionalReconfiguration-r16 ConditionalReconfiguration-r16 OPTIONAL, -- Need M

daps-SourceRelease-r16 ENUMERATED{true} OPTIONAL, -- Need N

t316-r16 SetupRelease {T316-r16} OPTIONAL, -- Need M

needForGapsConfigNR-r16 SetupRelease {NeedForGapsConfigNR-r16} OPTIONAL, -- Need M

onDemandSIB-Request-r16 SetupRelease { OnDemandSIB-Request-r16 } OPTIONAL, -- Need M

dedicatedPosSysInfoDelivery-r16 OCTET STRING (CONTAINING PosSystemInformation-r16-IEs) OPTIONAL, -- Need N

sl-ConfigDedicatedNR-r16 SetupRelease {SL-ConfigDedicatedNR-r16} OPTIONAL, -- Need M

sl-ConfigDedicatedEUTRA-Info-r16 SetupRelease {SL-ConfigDedicatedEUTRA-Info-r16} OPTIONAL, -- Need M

targetCellSMTC-SCG-r16 SSB-MTC OPTIONAL, -- Need S

nonCriticalExtension RRCReconfiguration-v1700-IEs OPTIONAL

}

RRCReconfiguration-v1700-IEs ::= SEQUENCE {

otherConfig-v1700 OtherConfig-v1700 OPTIONAL, -- Need M

sl-L2RelayUE-Config-r17 SetupRelease { SL-L2RelayUE-Config-r17 } OPTIONAL, -- Need M

sl-L2RemoteUE-Config-r17 SetupRelease { SL-L2RemoteUE-Config-r17 } OPTIONAL, -- Need M

dedicatedPagingDelivery-r17 OCTET STRING (CONTAINING Paging) OPTIONAL, -- Cond PagingRelay

needForGapNCSG-ConfigNR-r17 SetupRelease {NeedForGapNCSG-ConfigNR-r17} OPTIONAL, -- Need M

needForGapNCSG-ConfigEUTRA-r17 SetupRelease {NeedForGapNCSG-ConfigEUTRA-r17} OPTIONAL, -- Need M

musim-GapConfig-r17 SetupRelease {MUSIM-GapConfig-r17} OPTIONAL, -- Need M

ul-GapFR2-Config-r17 SetupRelease { UL-GapFR2-Config-r17 } OPTIONAL, -- Need M

scg-State-r17 ENUMERATED { deactivated } OPTIONAL, -- Need S

appLayerMeasConfig-r17 AppLayerMeasConfig-r17 OPTIONAL, -- Need M

ue-TxTEG-RequestUL-TDOA-Config-r17 SetupRelease {UE-TxTEG-RequestUL-TDOA-Config-r17} OPTIONAL, -- Need M

nonCriticalExtension RRCReconfiguration-v1800-IEs OPTIONAL

}

RRCReconfiguration-v1800-IEs ::= SEQUENCE {

needForInterruptionConfigNR-r18 ENUMERATED { disabled, enabled } OPTIONAL, -- Need M

aerial-Config-r18 SetupRelease { Aerial-Config-r18 } OPTIONAL, -- Need M

sl-IndirectPathAddChange-r18 SetupRelease { SL-IndirectPathAddChange-r18 } OPTIONAL, -- Need M

n3c-IndirectPathAddChange-r18 SetupRelease { N3C-IndirectPathAddChange-r18 } OPTIONAL, -- Need M

n3c-IndirectPathConfigRelay-r18 SetupRelease { N3C-IndirectPathConfigRelay-r18 } OPTIONAL, -- Need M

otherConfig-v1800 OtherConfig-v1800 OPTIONAL, -- Need M

srs-PosResourceSetAggBW-CombinationList-r18 SetupRelease { SRS-PosResourceSetAggBW-CombinationList-r18 } OPTIONAL, -- Need M

ltm-Config-r18 SetupRelease {LTM-Config-r18} OPTIONAL, -- Need M

nonCriticalExtension RRCReconfiguration-v1830-IEs OPTIONAL

}

RRCReconfiguration-v1830-IEs ::= SEQUENCE {

otherConfig-v1830 OtherConfig-v1830 OPTIONAL, -- Need M

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Late non-critical Rel-15 extensions:

RRCReconfiguration-v15t0-IEs ::= SEQUENCE {

-- Following field is only to be used for late REL-15 extensions

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RRCReconfiguration-v16k0-IEs OPTIONAL

}

RRCReconfiguration-v16k0-IEs ::= SEQUENCE {

sl-ConfigDedicatedNR-v16k0 SetupRelease {SL-ConfigDedicatedNR-v16k0} OPTIONAL, -- Need M

nonCriticalExtension SEQUENCE{} OPTIONAL

}

MRDC-SecondaryCellGroupConfig ::= SEQUENCE {

mrdc-ReleaseAndAdd ENUMERATED {true} OPTIONAL, -- Need N

mrdc-SecondaryCellGroup CHOICE {

nr-SCG OCTET STRING (CONTAINING RRCReconfiguration),

eutra-SCG OCTET STRING

}

}

BAP-Config-r16 ::= SEQUENCE {

bap-Address-r16 BIT STRING (SIZE (10)) OPTIONAL, -- Need M

defaultUL-BAP-RoutingID-r16 BAP-RoutingID-r16 OPTIONAL, -- Need M

defaultUL-BH-RLC-Channel-r16 BH-RLC-ChannelID-r16 OPTIONAL, -- Need M

flowControlFeedbackType-r16 ENUMERATED {perBH-RLC-Channel, perRoutingID, both} OPTIONAL, -- Need R

...

}

MasterKeyUpdate ::= SEQUENCE {

keySetChangeIndicator BOOLEAN,

nextHopChainingCount NextHopChainingCount,

nas-Container OCTET STRING OPTIONAL, -- Cond securityNASC

...

}

OnDemandSIB-Request-r16 ::= SEQUENCE {

onDemandSIB-RequestProhibitTimer-r16 ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20, s30}

}

T316-r16 ::= ENUMERATED {ms50, ms100, ms200, ms300, ms400, ms500, ms600, ms1000, ms1500, ms2000}

IAB-IP-AddressConfigurationList-r16 ::= SEQUENCE {

iab-IP-AddressToAddModList-r16 SEQUENCE (SIZE(1..maxIAB-IP-Address-r16)) OF IAB-IP-AddressConfiguration-r16 OPTIONAL, -- Need N

iab-IP-AddressToReleaseList-r16 SEQUENCE (SIZE(1..maxIAB-IP-Address-r16)) OF IAB-IP-AddressIndex-r16 OPTIONAL, -- Need N

...

}

IAB-IP-AddressConfiguration-r16 ::= SEQUENCE {

iab-IP-AddressIndex-r16 IAB-IP-AddressIndex-r16,

iab-IP-Address-r16 IAB-IP-Address-r16 OPTIONAL, -- Need M

iab-IP-Usage-r16 IAB-IP-Usage-r16 OPTIONAL, -- Need M

iab-donor-DU-BAP-Address-r16 BIT STRING (SIZE(10)) OPTIONAL, -- Need M

...

}

SL-ConfigDedicatedEUTRA-Info-r16 ::= SEQUENCE {

sl-ConfigDedicatedEUTRA-r16 OCTET STRING OPTIONAL, -- Need M

sl-TimeOffsetEUTRA-List-r16 SEQUENCE (SIZE (8)) OF SL-TimeOffsetEUTRA-r16 OPTIONAL -- Need M

}

SL-TimeOffsetEUTRA-r16 ::= ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot625, ms0dot75, ms1, ms1dot25, ms1dot5, ms1dot75,

ms2, ms2dot5, ms3, ms4, ms5, ms6, ms8, ms10, ms20}

UE-TxTEG-RequestUL-TDOA-Config-r17 ::= CHOICE {

oneShot-r17 NULL,

periodicReporting-r17 ENUMERATED { ms160, ms320, ms1280, ms2560, ms61440, ms81920, ms368640, ms737280 }

}

SRS-PosResourceSetAggBW-CombinationList-r18 ::= SEQUENCE (SIZE(1.. maxNrOfLinkedSRS-PosResSetComb-r18)) OF SRS-PosResourceSetLinkedForAggBW-List-r18

SRS-PosResourceSetLinkedForAggBW-List-r18 ::= SEQUENCE (SIZE(2..maxNrOfLinkedSRS-PosResourceSet-r18)) OF SRS-PosResourceSetLinkedForAggBW-r18

-- TAG-RRCRECONFIGURATION-STOP

-- ASN1STOP

|  |
| --- |
| *RRCReconfiguration-IEs* field descriptions |
| ***appLayerMeasConfig***  This field is used to configure application layer measurements. This field is absent when the UE is configured to operate with shared spectrum channel access or if *sl-L2RemoteUE-Config-r17* is configured or not released. |
| ***bap-Config***  This field is used to configure the BAP entity for IAB nodes. |
| ***bap-Address***  Indicates the BAP address of an IAB-node. The BAP address of an IAB-node cannot be changed once configured for the cell group to the BAP entity. |
| ***conditionalReconfiguration***  Configuration of candidate target SpCell(s) and execution condition(s) for conditional handover, conditional PSCell addition or conditional PSCell change. The field is absent if any DAPS bearer is configured, if the *sl-L2RemoteUE-Config* or *sl-L2RelayUE-Config* is configured, or if the *RRCReconfiguration* message is contained within *condRRCReconfig*. When the *masterCellGroup* and/or *secondaryCellGroup* includes *ReconfigurationWithSync*, if this field is present, it only includes configurations/fields specific to subsequent CPAC. The *RRCReconfiguration* message contained in *DLInformationTransferMRDC* cannot contain the field *conditionalReconfiguration* for conditional PSCell change or for conditional PSCell addition. The network does not include this field in an *RRCReconfiguration* message contained within a *LTM-Config* IE*.* |
| ***daps-SourceRelease***  Indicates to UE that the source cell part of DAPS operation is to be stopped and the source cell part of DAPS configuration is to be released. |
| ***dedicatedNAS-MessageList***  This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for each PDU in the list. |
| ***dedicatedPagingDelivery***  This field is used to transfer *Paging* message for the [RIL]: O510, SLRelay associated L2 U2N Remote UE or for the associated child UE to the L2 U2N Relay UE [RIL]: O502, SLRelay or to L2 Last U2N Relay UE in RRC\_CONNECTED. |
| ***dedicatedPosSysInfoDelivery***  This field is used to transfer *SIBPos* to the UE in RRC\_CONNECTED. |
| ***dedicatedSIB1-Delivery***  This field is used to transfer *SIB1* to the UE (including L2 U2N Remote UE). The field has the same values as the corresponding configuration in *servingCellConfigCommon*. |
| ***dedicatedSystemInformationDelivery***  This field is used to transfer *SIB6*, *SIB7*, *SIB8, SIB19, SIB20, SIB21, SIB25* to the UE with an active BWP with no common search space configured or the L2 U2N Remote UE in RRC\_CONNECTED. For UEs in RRC\_CONNECTED (including L2 U2N Remote UE), this field is also used to transfer the SIBs requested on-demand. |
| ***defaultUL-BAP-RoutingID***  This field is used for IAB-node to configure the default uplink Routing ID, which is used by IAB-node during IAB-node bootstrapping*,* migration, IAB-MT RRC resume and IAB-MT RRC re-establishment for *F1-C* and *non-F1* traffic. The *defaultUL-BAP-RoutingID* can be (re-)configured when IAB-node IP address for *F1-C* related traffic changes. This field is mandatory only for IAB-node bootstrapping. |
| ***defaultUL-BH-RLC-Channel***  This field is used for IAB-nodes to configure the default uplink BH RLC channel*,* which is used by IAB-nodeduring IAB-node bootstrapping*,* migration, IAB-MT RRC resume and IAB-MT RRC re-establishment *for F1-C and non-F1 traffic*. The *defaultUL-BH-RLC-Channel* can be (re-)configured when IAB-node IP address for *F1-C* related traffic changes, and the new IP address is anchored at a different IAB-donor-DU. This field is mandatory for IAB-node bootstrapping. If the IAB-MT is operating in EN-DC, the default uplink BH RLC channel is referring to an RLC channel on the SCG; Otherwise, it is referring to an RLC channel either on the MCG or on the SCG depending on whether the MN or the SN configures this field. |
| ***flowControlFeedbackType***  This field is only used for IAB-node that support hop-by-hop flow control to configure the type of flow control feedback. Value *perBH-RLC-Channel* indicates that the IAB-node shall provide flow control feedback per BH RLC channel, value *perRoutingID* indicates that the IAB-node shall provide flow control feedback per routing ID, and value *both* indicates that the IAB-node shall provide flow control feedback both per BH RLC channel and per routing ID. |
| ***fullConfig***  Indicates that the full configuration option is applicable for the *RRCReconfiguration* message for intra-system intra-RAT HO. For inter-RAT HO from E-UTRA to NR, *fullConfig* indicates whether or not delta signalling of SDAP/PDCP from source RAT is applicable. This field is absent if any DAPS bearer is configured or when the *RRCReconfiguration* message is transmitted on SRB3, and in an *RRCReconfiguration* message for SCG contained in another *RRCReconfiguration* message (or *RRCConnectionReconfiguration* message, see TS 36.331 [10]) transmitted on SRB1. |
| ***iab-IP-Address***  This field is used to provide the IP address information for IAB-node. |
| ***iab-IP-AddressIndex***  This field is used to identify a configuration of an IP address. |
| ***iab-IP-AddressToAddModList***  List of IP addresses allocated for IAB-node to be added and modified. |
| ***iab-IP-AddressToReleaseList***  List of IP address allocated for IAB-node to be released. |
| ***iab-IP-Usage***  This field is used to indicate the usage of the assigned IP address. If this field is not configured, the assigned IP address is used for all traffic. |
| ***iab-donor-DU-BAP-Address***  This field is used to indicate the BAP address of the IAB-donor-DU where the IP address is anchored. |
| ***keySetChangeIndicator***  Indicates whether UE shall derive a new KgNB. If *reconfigurationWithSync* is included, value *true* indicates that a KgNB key is derived from a KAMF key taken into use through the latest successful NAS SMC procedure, or N2 handover procedure with KAMF change, as described in TS 33.501 [11] for KgNB re-keying. Value *false* indicates that the new KgNB key is obtained from the current KgNB key or from the NH as described in TS 33.501 [11]. |
| ***ltm-Config***  The network does not configure this field in an *RRCReconfiguration* message within an *LTM-Config* IE and *ConditionalReconfiguration* IE. |
| ***masterCellGroup***  Configuration of master cell group. |
| ***mrdc-ReleaseAndAdd***  This field indicates that the current SCG configuration is released and a new SCG is added at the same time. |
| ***mrdc-SecondaryCellGroup***  Includes an RRC message for SCG configuration in NR-DC or NE-DC. For NR-DC (nr-SCG), *mrdc-SecondaryCellGroup* contains the *RRCReconfiguration* message as generated (entirely) by SN gNB. In this version of the specification, the RRC message can only include fields *secondaryCellGroup, otherConfig, conditionalReconfiguration,* *ltm-Config,* *measConfig,* *bap-Config,* *IAB-IP-AddressConfigurationList* and *appLayerMeasConfig*.  For NE-DC (eutra-SCG), *mrdc-SecondaryCellGroup* includes the E-UTRA *RRCConnectionReconfiguration* message as specified in TS 36.331 [10]. In this version of the specification, the E-UTRA RRC message can only include the field *scg-Configuration*. |
| ***mrdc-SecondaryCellGroupConfig***  This field is used to configure and release an SCG in NR-DC and NE-DC. In an *RRCReconfiguration* message within an *LTM-Config* IE associated with the MCG, if this field is present its value can only be set to *release*. |
| ***musim-GapConfig***  Indicates the MUSIM gap configuration and controls setup/release of MUSIM gaps. In this version of the specification, the network does not configure MUSIM gap together preconfigured measurement gap for positioning. For the UE supporting *musim-GapPriorityPreference*, the network can configure MUSIM gap together with concurrent measurement gap. Otherwise, the network does not configure MUSIM gap together with concurrent measurement gap. |
| ***nas-Container***  This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this field, although it affects activation of AS security after inter-system handover to NR. The content is defined in TS 24.501 [23]. |
| ***needForGapsConfigNR***  Configuration for the UE to report measurement gap requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigEUTRA***  Configuration for the UE to report measurement gap and NCSG requirement information of E‑UTRA target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForGapNCSG-ConfigNR***  Configuration for the UE to report measurement gap and NCSG requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. |
| ***needForInterruptionConfigNR***  Indicates whether the UE shall report interruption requirement information of NR target bands in the *RRCReconfigurationComplete* and *RRCResumeComplete* message. The network sets this field to *enabled* only if the *needForGapsConfigNR* is configured. The network sets this field to *disabled* if the *needForGapsConfigNR* is released. |
| ***nextHopChainingCount***  Parameter NCC: See TS 33.501 [11] |
| ***onDemandSIB-Request***  Indicates that the UE is allowed to request SIB(s) on-demand while in RRC\_CONNECTED according to clause 5.2.2.3.5. |
| ***onDemandSIB-RequestProhibitTimer***  Prohibit timer for requesting SIB(s) on-demand while in RRC\_CONNECTED according to clause 5.2.2.3.5. Value in seconds. Value s0 means prohibit timer is set to 0 seconds, value s0dot5 means prohibit timer is set to 0.5 seconds, value s1 means prohibit timer is set to 1 second and so on. |
| ***otherConfig***  Contains configuration related to other configurations. When configured for the SCG, only fields *drx-PreferenceConfig, maxBW-PreferenceConfig, maxBW-PreferenceConfigFR2-2, maxCC-PreferenceConfig, maxMIMO-LayerPreferenceConfig*, *maxMIMO-LayerPreferenceConfigFR2-2*, *minSchedulingOffsetPreferenceConfig, minSchedulingOffsetPreferenceConfigExt, rlm-RelaxationReportingConfig, bfd-RelaxationReportingConfig, btNameList, wlanNameList, sensorNameList*, *obtainCommonLocation*, *idc-AssistanceConfig*, *multiRx-PreferenceReportingConfigFR2*, *ul-TrafficInfoReportingConfig*, *n3c-RelayUE-InfoReportConfig, successPSCell-Config* and *sn-InitiatedPSCellChange* can be included. |
| ***radioBearerConfig***  Configuration of Radio Bearers (DRBs, SRBs, multicast MRBs) including SDAP/PDCP. In (NG)EN-DC this field may only be present if the *RRCReconfiguration* is transmitted over SRB3. SRB4 should not be configured if *sl-L2RemoteUE-Config-r17* is configured or not released. |
| ***radioBearerConfig2***  Configuration of Radio Bearers (DRBs, SRBs) including SDAP/PDCP. This field can only be used if the UE supports NR-DC or NE-DC. |
| ***scg-State***  Indicates that the SCG is in deactivated state.  This field is not used  - in an *RRCReconfiguration* message received:  - within *mrdc-SecondaryCellGroup*, or  - in an E-UTRA *RRCConnectionReconfiguration* message, or  - in an E-UTRA *RRCConnectionResume* message or  - in an *RRCReconfiguration* message received via SRB3, except if the *RRCReconfiguration* message is included in *DLInformationTransferMRDC*.  The field is absent if CPA, CPC, or subsequent CPAC is configured for the UE, or if the *RRCReconfiguration* message is contained in *CondRRCReconfig,* or PSCell is configured with *tag2*, or if the *RRCReconfiguration* message is included within an *LTM-Config* IE. |
| ***sl-L2RelayUE-Config***  Contains L2 U2N relay operation related configurations used by a UE acting as or to be acting as a L2 U2N Relay UE or L2 U2U relay operation related configuration used by a UE acting as a L2 U2U Relay UE. In case of L2 U2N relay operation, the field is absent if *conditionalReconfiguration* is configured for CHO. |
| ***sl-L2RemoteUE-Config***  Contains L2 U2N relay operation related configurations used by a UE acting as or to be acting as a L2 U2N Remote UE or L2 U2U relay operation related configuration used by a UE acting as a L2 U2U Remote UE. In case of L2 U2N relay operation, the field is absent if *conditionalReconfiguration* is configured for CHO, or if *appLayerMeasConfig* or SRB4 is configured/not released. |
| ***secondaryCellGroup***  Configuration of secondary cell group ((NG)EN-DC or NR-DC). |
| ***sk-Counter***  A counter used upon initial configuration of S-KgNB or S-KeNB, as well as upon refresh of S-KgNB or S-KeNB. This field is always included either upon initial configuration of an NR SCG or upon configuration of the first RB with *keyToUse* set to *secondary*, whichever happens first. This field is absent if there is neither any NR SCG nor any RB with *keyToUse* set to *secondary*, or if the *RRCReconfiguration* message is contained in *condRRCReconfig* for subsequent CPAC. |
| ***sl-ConfigDedicatedNR***  This field is used to provide the dedicated configurations for NR sidelink communication/discovery/positioning. |
| ***sl-ConfigDedicatedEUTRA-Info***  This field includes the E-UTRA *RRCConnectionReconfiguration* as specified in TS 36.331 [10]. In this version of the specification, the E-UTRA *RRCConnectionReconfiguration* can only includes sidelink related fields for V2X sidelink communication, i.e. *sl-V2X-ConfigDedicated*, *sl-V2X-SPS-Config*, *measConfig* and/or *otherConfig*. |
| ***srs-PosResourceSetLinkedForAggBWList***  This field indicates the SRS resource sets across two or three carriers which are linked for SRS bandwidth aggregation in RRC\_CONNECTED state as defined in clause 6.2.1.4 of TS 38.214 [19]. |
| ***sl-TimeOffsetEUTRA***  This field indicates the possible time offset to (de)activation of V2X sidelink transmission after receiving DCI format 3\_1 used for scheduling V2X sidelink communication. Value *ms0dpt75* corresponds to 0.75ms, *ms1* corresponds to 1ms and so on. The network includes this field only when *sl-ConfigDedicatedEUTRA* is configured. |
| ***targetCellSMTC-SCG***  The SSB periodicity/offset/duration configuration of target cell for NR PSCell addition and SN change. When UE receives this field, UE applies the configuration based on the timing reference of NR PCell for PSCell addition and PSCell change for the case of no reconfiguration with sync of MCG, and UE applies the configuration based on the timing reference of target NR PCell for the case of reconfiguration with sync of MCG. If both this field and the *smtc* in *secondaryCellGroup* -> *SpCellConfig* -> *reconfigurationWithSync* are absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. |
| ***t316***  Indicates the value for timer T316 as described in clause 7.1. Value *ms50* corresponds to 50 ms, value *ms100* corresponds to 100 ms and so on. This field can be configured only if the UE is configured with split SRB1 or SRB3. |
| ***ue-TxTEG-RequestUL-TDOA-Config***  Configures the periodicity of UE reporting for the association between Tx TEG and SRS Positioning resources. When configured with *oneShot* UE reports the association only one time. When configured with *periodicReporting* UE reports the association periodically and the *periodicReporting* indicates the periodicity. Value *ms160* corresponds to 160ms, value *ms320* corresponds to 320ms and so on. |
| ***ul-GapFR2-Config***  Indicates the FR2 UL gap configuration to UE. In EN-DC and NGEN-DC, the SN decides and configures the FR2 UL gap pattern. In NE-DC, the MN decides and configures the FR2 UL gap pattern. In NR-DC without FR2-FR2 band combination, the network entity which is configured with FR2 serving cell(s) decides and configures the FR2 UL gap pattern. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *nonHO* | The field is absent in case of reconfiguration with sync within NR or to NR; otherwise it is optionally present, need N. |
| *securityNASC* | This field is mandatory present in case of inter system handover. Otherwise the field is optionally present, need N. |
| *MasterKeyChange* | This field is mandatory present in case *masterCellGroup* includes *ReconfigurationWithSync* and *RadioBearerConfig* includes *SecurityConfig* with *SecurityAlgorithmConfig*, indicating a change of the AS security algorithms associated to the master key. If *ReconfigurationWithSync* is included for other cases, this field is optionally present, need N. If *ReconfigurationWithSync* is part of an *RRCReconfiguration* message within an *LTM-Config* IE associated with the MCG, the field is absent. Otherwise the field is absent. |
| *FullConfig* | The field is mandatory present in case of inter-system handover from E-UTRA/EPC to NR. It is optionally present, Need N, during a reconfiguration with sync which is not related to an LTM cell switch or subsequent CPAC, and also in first reconfiguration after reestablishment; or for intra-system handover from E-UTRA/5GC to NR. It is absent otherwise. |
| *SCG* | The field is mandatory present in:  - an *RRCReconfiguration* message contained in an *RRCResume* message (or in an *RRCConnectionResume* message, see TS 36.331 [10]),  - an *RRCReconfiguration* message contained in an *RRCConnectionReconfiguration* message, see TS 36.331 [10], which is contained in *DLInformationTransferMRDC* transmitted on SRB3 (as a response to *ULInformationTransferMRDC* including an *MCGFailureInformation*).  The field is optional present, Need M, in:  - an *RRCReconfiguration* message transmitted on SRB3,  - an *RRCReconfiguration* message contained in another *RRCReconfiguration* message (or in an *RRCConnectionReconfiguration* message, see TS 36.331 [10]) transmitted on SRB1  - an *RRCReconfiguration* message contained in another *RRCReconfiguration* message which is contained in *DLInformationTransferMRDC* transmitted on SRB3 (as a response to *ULInformationTransferMRDC* including an *MCGFailureInformation*).  Otherwise, the field is absent. |
| *PagingRelay* | For L2 U2N Relay UE, the field is optionally present, Need N. Otherwise, it is absent. |

=================================NEXT CHANGE=======================================

## 6.3 RRC information elements

### 6.3.0 Parameterized types

#### – *SetupRelease*

*SetupRelease* allows the *ElementTypeParam* to be used as the referenced data type for the setup and release entries. See A.3.8 for guidelines.

-- ASN1START

-- TAG-SETUPRELEASE-START

SetupRelease { ElementTypeParam } ::= CHOICE {

release NULL,

setup ElementTypeParam

}

-- TAG-SETUPRELEASE-STOP

-- ASN1STOP

### 6.3.1 System information blocks

=================================NEXT CHANGE=======================================

#### – *SIB12*

SIB12 contains NR sidelink communication/discovery configuration.

*SIB12* information element

-- ASN1START

-- TAG-SIB12-START

SIB12-r16 ::= SEQUENCE {

segmentNumber-r16 INTEGER (0..63),

segmentType-r16 ENUMERATED {notLastSegment, lastSegment},

segmentContainer-r16 OCTET STRING

}

SIB12-IEs-r16 ::= SEQUENCE {

sl-ConfigCommonNR-r16 SL-ConfigCommonNR-r16,

lateNonCriticalExtension OCTET STRING (CONTAINING SIB12-IEs-v16k0) OPTIONAL,

...,

[[

sl-DRX-ConfigCommonGC-BC-r17 SL-DRX-ConfigGC-BC-r17 OPTIONAL, -- Need R

sl-DiscConfigCommon-r17 SL-DiscConfigCommon-r17 OPTIONAL, -- Need R

sl-L2U2N-Relay-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-NonRelayDiscovery-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-L3U2N-RelayDiscovery-r17 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-TimersAndConstantsRemoteUE-r17 UE-TimersAndConstantsRemoteUE-r17 OPTIONAL -- Need R

]],

[[

sl-FreqInfoListSizeExt-v1800 SEQUENCE (SIZE (1..maxNrofFreqSL-1-r18)) OF SL-FreqConfigCommon-r16 OPTIONAL, -- Need R

sl-RLC-BearerConfigListSizeExt-v1800 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL, -- Need R

sl-SyncFreqList-r18 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-Freq-Id-r16 OPTIONAL, -- Need R

sl-SyncTxMultiFreq-r18 ENUMERATED {true} OPTIONAL, -- Need S

sl-MaxTransPowerCA-r18 P-Max OPTIONAL, -- Need R

sl-DiscConfigCommon-v1800 SL-DiscConfigCommon-v1800 OPTIONAL, -- Need R

sl-L2-U2U-Relay-r18 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-L3-U2U-RelayDiscovery-r18 ENUMERATED {enabled} OPTIONAL, -- Need R

t400-U2U-r18 ENUMERATED {ms200, ms400, ms600, ms800, ms1200, ms2000, ms3000, ms4000} OPTIONAL -- Need R

]],

[[

sl-DiscConfigCommon-v1840 SL-DiscConfigCommon-v1840 OPTIONAL -- Need R

]],

[[

sl-L2U2N-MH-Relay-r19 ENUMERATED {enabled} OPTIONAL, -- Cond SH-Relay

sl-DiscConfigCommon-v19xy SL-DiscConfigCommon-v19xy OPTIONAL -- Need R

]]

}

-- Late non-critical Rel-16 extensions:

SIB12-IEs-v16k0 ::= SEQUENCE {

sl-ConfigCommonNR-v16k0 SL-ConfigCommonNR-v16k0 OPTIONAL, -- Need R

nonCriticalExtension SEQUENCE{} OPTIONAL

}

SL-ConfigCommonNR-r16 ::= SEQUENCE {

sl-FreqInfoList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigCommon-r16 OPTIONAL, -- Need R

sl-UE-SelectedConfig-r16 SL-UE-SelectedConfig-r16 OPTIONAL, -- Need R

sl-NR-AnchorCarrierFreqList-r16 SL-NR-AnchorCarrierFreqList-r16 OPTIONAL, -- Need R

sl-EUTRA-AnchorCarrierFreqList-r16 SL-EUTRA-AnchorCarrierFreqList-r16 OPTIONAL, -- Need R

sl-RadioBearerConfigList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SL-RadioBearerConfig-r16 OPTIONAL, -- Need R

sl-RLC-BearerConfigList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL, -- Need R

sl-MeasConfigCommon-r16 SL-MeasConfigCommon-r16 OPTIONAL, -- Need R

sl-CSI-Acquisition-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-OffsetDFN-r16 INTEGER (1..1000) OPTIONAL, -- Need R

t400-r16 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need R

sl-MaxNumConsecutiveDTX-r16 ENUMERATED {n1, n2, n3, n4, n6, n8, n16, n32} OPTIONAL, -- Need R

sl-SSB-PriorityNR-r16 INTEGER (1..8) OPTIONAL -- Need R

}

SL-ConfigCommonNR-v16k0 ::= SEQUENCE {

sl-FreqInfoListExt-v16k0 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigCommonExt-v16k0 OPTIONAL -- Need R

}

SL-NR-AnchorCarrierFreqList-r16 ::= SEQUENCE (SIZE (1..maxFreqSL-NR-r16)) OF ARFCN-ValueNR

SL-EUTRA-AnchorCarrierFreqList-r16 ::= SEQUENCE (SIZE (1..maxFreqSL-EUTRA-r16)) OF ARFCN-ValueEUTRA

SL-DiscConfigCommon-r17 ::= SEQUENCE {

sl-RelayUE-ConfigCommon-r17 SL-RelayUE-Config-r17,

sl-RemoteUE-ConfigCommon-r17 SL-RemoteUE-Config-r17

}

SL-DiscConfigCommon-v1800 ::= SEQUENCE {

sl-RelayUE-ConfigCommonU2U-r18 SL-RelayUE-ConfigU2U-r18,

sl-RemoteUE-ConfigCommonU2U-r18 SL-RemoteUE-ConfigU2U-r18

}

SL-DiscConfigCommon-v1840 ::= SEQUENCE {

sl-RelayUE-ConfigCommonU2U-v1840 SL-RelayUE-ConfigU2U-v1840,

sl-RemoteUE-ConfigCommonU2U-v1840 SL-RemoteUE-ConfigU2U-v1830

}

SL-DiscConfigCommon-v19xy ::= SEQUENCE {

sl-RelayUE-ConfigCommonMH-r19 SL-RelayUE-ConfigMH-r19

}

-- TAG-SIB12-STOP

-- ASN1STOP

| *SIB12* field descriptions |
| --- |
| ***segmentContainer***  This field includes a segment of the encoded *SIB12-IEs*. The size of the included segment in this container should be small enough that the SIB message size is less than or equal to the maximum size of a NR SI, i.e. 2976 bits when SIB12 is broadcast. |
| ***segmentNumber***  This field identifies the sequence number of a segment of *SIB12-IEs*. A segment number of zero corresponds to the first segment, A segment number of one corresponds to the second segment, and so on. |
| ***segmentType***  This field indicates whether the included segment is the last segment or not. |
| ***sl-CSI-Acquisition***  This field indicates whether CSI reporting is enabled in sidelink unicast. If not set, SL CSI reporting is disabled. |
| ***sl-DRX-ConfigCommonGC-BC***  This field indicates the sidelink DRX configuration for groupcast and broadcast communication, as specified in TS 38.321 [3]. This field, if present, also indicates the gNB is capable of sidelink DRX. |
| ***sl-EUTRA-AnchorCarrierFreqList***  This field indicates the EUTRA anchor carrier frequency list, which can provide the NR sidelink communication configurations. |
| ***sl-FreqInfoList, sl-FreqInfoListSizeExt, sl-FreqInfoListExt***  This field indicates the NR sidelink communication/discovery configuration on some carrier frequency (ies). In this release, only one entry can be configured in *sl-FreqInfoList*. More entries can be configured in *sl-FreqInfoListSizeExt*. If network includes *sl-FreqInfoListExt*, it includes the same number of entries, and listed in the same order, as in *sl-FreqInfoList* together with *sl-FreqInfoListSizeExt*. The first entry corresponds to the AdditionalSpectrumEmission of the frequency of first entry in *sl-FreqInfoList* broadcast in *SIB12*, the second entry corresponds to the AdditionalSpectrumEmission of the frequency of first entry in *sl-FreqInfoListSizeExt* broadcast in *SIB12*, the third entry corresponds to the AdditionalSpectrumEmission of the frequency of second entry in *sl-FreqInfoListSizeExt* broadcast in *SIB12* and so on. |
| ***sl-L2U2N-Relay***  This field indicates the support of NR sidelink Layer-2 single hop U2N relay operation. |
| ***sl-L2U2N-MH-Relay***  This field indicates the support of NR sidelink Layer-2 multi hop U2N relay operation. |
| ***sl-L2-U2U-Relay***  This field indicates the support of NR sidelink Layer-2 U2U relay operation. |
| ***sl-L3U2N-RelayDiscovery***  This field indicates the support of L3 U2N relay AS-layer capability, i.e. NR sidelink L3 U2N relay discovery. |
| ***sl-L3-U2U-RelayDiscovery***  This field indicates the support of L3 U2U relay AS-layer capability, i.e. NR sidelink L3 U2U relay discovery. |
| ***sl-MaxNumConsecutiveDTX***  This field indicates the maximum number of consecutive HARQ DTX before triggering sidelink RLF. Value n1 corresponds to 1, value n2 corresponds to 2, and so on. |
| ***sl-MaxTransPowerCA***  The maximum total transmit power to be used by the UE across all sidelink carriers. |
| ***sl-MeasConfigCommon***  This field indicates the measurement configurations (e.g. RSRP) for NR sidelink communication. |
| ***sl-NonRelayDiscovery***  This field indicates the support of NR sidelink non-relay discovery. |
| ***sl-NR-AnchorCarrierFreqList***  This field indicates the NR anchor carrier frequency list, which can provide the NR sidelink communication/discovery configurations. |
| ***sl-OffsetDFN***  Indicates the timing offset for the UE to determine DFN timing when GNSS is used for timing reference. Value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002 milliseconds, and so on. |
| ***sl-RadioBearerConfigList***  This field indicates one or multiple sidelink radio bearer configurations. |
| ***sl-RLC-BearerConfigList, sl-RLC-BearerConfigListSizeExt***  This field indicates one or multiple sidelink RLC bearer configurations. For L2 U2U operation, *sl-RLC-BearerConfigList* also indicates the PC5 Relay RLC Channel configurations. |
| ***sl-SSB-PriorityNR***  This field indicates the priority of NR sidelink SSB transmission and reception. |
| ***sl-SyncFreqList***  Indicates a list of candidate carrier frequencies that can be used for the synchronisation of NR sidelink communication. For *SL-Freq-Id-r16*, the value 1 corresponds to the frequency of first entry in *sl-FreqInfoList* broadcast in *SIB12*, the value 2 corresponds to the frequency of first entry in *sl-FreqInfoListSizeExt* broadcast in *SIB12*, the value 3 corresponds to the frequency of second entry in *sl-FreqInfoListSizeExt* broadcast in *SIB12* and so on. |
| ***sl-SyncTxMultiFreq***  Indicates that the UE transmits S-SSB on multiple carrier frequencies for NR sidelink communication. If this field is absent, the UE transmits S-SSB only on the synchronisation carrier frequency. |
| ***t400***  Indicates the value for timer T400 as described in clause 7.1. Value *ms100* corresponds to 100 ms, value *ms200* corresponds to 200 ms and so on. |
| ***t400-U2U***  Indicates the value for timer T400 to be applied for end-to-end PC5 connection in sidelink U2U relay operation as described in clause 7.1. Value *ms200* corresponds to 200 ms, value *ms400* corresponds to 400 ms and so on. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SH-Relay* | The field is optionally present, Need R, if *sl-L2U2N-Relay* is configured; otherwise it is absent, Need R. |

=================================NEXT CHANGE=======================================

### 6.3.2 Radio resource control information elements

=================================NEXT CHANGE=======================================

#### – *CellGroupConfig*

The *CellGroupConfig* IE is used to configure a master cell group (MCG) or secondary cell group (SCG). A cell group comprises of one MAC entity, a set of logical channels with associated RLC entities and of a primary cell (SpCell) and one or more secondary cells (SCells). For an NCR-MT, the *CellGroupConfig* IE is also used to provide the configuration of side control information for the NCR-Fwd access link.

*CellGroupConfig* information element

-- ASN1START

-- TAG-CELLGROUPCONFIG-START

-- Configuration of one Cell-Group:

CellGroupConfig ::= SEQUENCE {

cellGroupId CellGroupId,

rlc-BearerToAddModList SEQUENCE (SIZE(1..maxLC-ID)) OF RLC-BearerConfig OPTIONAL, -- Need N

rlc-BearerToReleaseList SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentity OPTIONAL, -- Need N

mac-CellGroupConfig MAC-CellGroupConfig OPTIONAL, -- Need M

physicalCellGroupConfig PhysicalCellGroupConfig OPTIONAL, -- Need M

spCellConfig SpCellConfig OPTIONAL, -- Need M

sCellToAddModList SEQUENCE (SIZE (1..maxNrofSCells)) OF SCellConfig OPTIONAL, -- Need N

sCellToReleaseList SEQUENCE (SIZE (1..maxNrofSCells)) OF SCellIndex OPTIONAL, -- Need N

...,

[[

reportUplinkTxDirectCurrent ENUMERATED {true} OPTIONAL -- Cond BWP-Reconfig

]],

[[

bap-Address-r16 BIT STRING (SIZE (10)) OPTIONAL, -- Need M

bh-RLC-ChannelToAddModList-r16 SEQUENCE (SIZE(1..maxBH-RLC-ChannelID-r16)) OF BH-RLC-ChannelConfig-r16 OPTIONAL, -- Need N

bh-RLC-ChannelToReleaseList-r16 SEQUENCE (SIZE(1..maxBH-RLC-ChannelID-r16)) OF BH-RLC-ChannelID-r16 OPTIONAL, -- Need N

f1c-TransferPath-r16 ENUMERATED {lte, nr, both} OPTIONAL, -- Need M

simultaneousTCI-UpdateList1-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousTCI-UpdateList2-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousSpatial-UpdatedList1-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousSpatial-UpdatedList2-r16 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

uplinkTxSwitchingOption-r16 ENUMERATED {switchedUL, dualUL} OPTIONAL, -- Need R

uplinkTxSwitchingPowerBoosting-r16 ENUMERATED {enabled} OPTIONAL -- Need R

]],

[[

reportUplinkTxDirectCurrentTwoCarrier-r16 ENUMERATED {true} OPTIONAL -- Need N

]],

[[

f1c-TransferPathNRDC-r17 ENUMERATED {mcg, scg, both} OPTIONAL, -- Need M

uplinkTxSwitching-2T-Mode-r17 ENUMERATED {enabled} OPTIONAL, -- Cond 2Tx

uplinkTxSwitching-DualUL-TxState-r17 ENUMERATED {oneT, twoT} OPTIONAL, -- Cond 2Tx

uu-RelayRLC-ChannelToAddModList-r17 SEQUENCE (SIZE(1..maxUu-RelayRLC-ChannelID-r17)) OF Uu-RelayRLC-ChannelConfig-r17

OPTIONAL, -- Need N

uu-RelayRLC-ChannelToReleaseList-r17 SEQUENCE (SIZE(1..maxUu-RelayRLC-ChannelID-r17)) OF Uu-RelayRLC-ChannelID-r17

OPTIONAL, -- Need N

simultaneousU-TCI-UpdateList1-r17 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousU-TCI-UpdateList2-r17 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousU-TCI-UpdateList3-r17 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

simultaneousU-TCI-UpdateList4-r17 SEQUENCE (SIZE (1..maxNrofServingCellsTCI-r16)) OF ServCellIndex OPTIONAL, -- Need R

rlc-BearerToReleaseListExt-r17 SEQUENCE (SIZE(1..maxLC-ID)) OF LogicalChannelIdentityExt-r17 OPTIONAL, -- Need N

iab-ResourceConfigToAddModList-r17 SEQUENCE (SIZE(1..maxNrofIABResourceConfig-r17)) OF IAB-ResourceConfig-r17 OPTIONAL, -- Need N

iab-ResourceConfigToReleaseList-r17 SEQUENCE (SIZE(1..maxNrofIABResourceConfig-r17)) OF IAB-ResourceConfigID-r17 OPTIONAL -- Need N

]],

[[

reportUplinkTxDirectCurrentMoreCarrier-r17 ReportUplinkTxDirectCurrentMoreCarrier-r17 OPTIONAL -- Need N

]],

[[

prioSCellPRACH-OverSP-PeriodicSRS-r17 ENUMERATED {enabled} OPTIONAL -- Need R

]],

[[

ncr-FwdConfig-r18 SetupRelease { NCR-FwdConfig-r18 } OPTIONAL, -- Cond NCR

autonomousDenialParameters-r18 SetupRelease {AutonomousDenialParameters-r18} OPTIONAL, -- Need M

nonCollocatedTypeMRDC-r18 ENUMERATED { true } OPTIONAL, -- Need R

nonCollocatedTypeNR-CA-r18 ENUMERATED { true } OPTIONAL, -- Need R

uplinkTxSwitchingMoreBands-r18 SetupRelease { UplinkTxSwitchingMoreBands-r18 } OPTIONAL -- Need M

]]

}

-- Serving cell specific MAC and PHY parameters for a SpCell:

SpCellConfig ::= SEQUENCE {

servCellIndex ServCellIndex OPTIONAL, -- Cond SCG

reconfigurationWithSync ReconfigurationWithSync OPTIONAL, -- Cond ReconfWithSync

rlf-TimersAndConstants SetupRelease { RLF-TimersAndConstants } OPTIONAL, -- Need M

rlmInSyncOutOfSyncThreshold ENUMERATED {n1} OPTIONAL, -- Need S

spCellConfigDedicated ServingCellConfig OPTIONAL, -- Need M

...,

[[

lowMobilityEvaluationConnected-r17 SEQUENCE {

s-SearchDeltaP-Connected-r17 ENUMERATED {dB3, dB6, dB9, dB12, dB15, spare3, spare2, spare1},

t-SearchDeltaP-Connected-r17 ENUMERATED {s5, s10, s20, s30, s60, s120, s180, s240, s300, spare7, spare6, spare5,

spare4, spare3, spare2, spare1}

} OPTIONAL, -- Need R

goodServingCellEvaluationRLM-r17 GoodServingCellEvaluation-r17 OPTIONAL, -- Need R

goodServingCellEvaluationBFD-r17 GoodServingCellEvaluation-r17 OPTIONAL, -- Need R

deactivatedSCG-Config-r17 SetupRelease { DeactivatedSCG-Config-r17 } OPTIONAL -- Cond SCG-Opt

]]

}

ReconfigurationWithSync ::= SEQUENCE {

spCellConfigCommon ServingCellConfigCommon OPTIONAL, -- Need M

newUE-Identity RNTI-Value,

t304 ENUMERATED {ms50, ms100, ms150, ms200, ms500, ms1000, ms2000, ms10000},

rach-ConfigDedicated CHOICE {

uplink RACH-ConfigDedicated,

supplementaryUplink RACH-ConfigDedicated

} OPTIONAL, -- Need N

...,

[[

smtc SSB-MTC OPTIONAL -- Need S

]],

[[

daps-UplinkPowerConfig-r16 DAPS-UplinkPowerConfig-r16 OPTIONAL -- Need N

]],

[[

sl-PathSwitchConfig-r17 SL-PathSwitchConfig-r17 OPTIONAL -- Cond DirectToIndirect-PathSwitch

]],

[[

rach-LessHO-r18 RACH-LessHO-r18 OPTIONAL, -- Need N

sl-IndirectPathMaintain-r18 ENUMERATED{true} OPTIONAL -- Cond MP

]]

}

DAPS-UplinkPowerConfig-r16 ::= SEQUENCE {

p-DAPS-Source-r16 P-Max,

p-DAPS-Target-r16 P-Max,

uplinkPowerSharingDAPS-Mode-r16 ENUMERATED {semi-static-mode1, semi-static-mode2, dynamic }

}

SCellConfig ::= SEQUENCE {

sCellIndex SCellIndex,

sCellConfigCommon ServingCellConfigCommon OPTIONAL, -- Cond SCellAdd

sCellConfigDedicated ServingCellConfig OPTIONAL, -- Cond SCellAddMod

...,

[[

smtc SSB-MTC OPTIONAL -- Need S

]],

[[

sCellState-r16 ENUMERATED {activated} OPTIONAL, -- Cond SCellAddSync

secondaryDRX-GroupConfig-r16 ENUMERATED {true} OPTIONAL -- Need S

]],

[[

preConfGapStatus-r17 BIT STRING (SIZE (maxNrofGapId-r17)) OPTIONAL, -- Cond PreConfigMG

goodServingCellEvaluationBFD-r17 GoodServingCellEvaluation-r17 OPTIONAL, -- Need R

sCellSIB20-r17 SetupRelease { SCellSIB20-r17 } OPTIONAL -- Need M

]],

[[

plmn-IdentityInfoList-r17 SetupRelease {PLMN-IdentityInfoList} OPTIONAL, -- Cond SCellSIB20-Opt

npn-IdentityInfoList-r17 SetupRelease {NPN-IdentityInfoList-r16} OPTIONAL -- Cond SCellSIB20-Opt

]]

}

SCellSIB20-r17 ::= OCTET STRING (CONTAINING SystemInformation)

DeactivatedSCG-Config-r17 ::= SEQUENCE {

bfd-and-RLM-r17 BOOLEAN,

...

}

GoodServingCellEvaluation-r17 ::= SEQUENCE {

offset-r17 ENUMERATED {db2, db4, db6, db8} OPTIONAL -- Need S

}

SL-PathSwitchConfig-r17 ::= SEQUENCE {

targetRelayUE-Identity-r17 SL-SourceIdentity-r17,

t420-r17 ENUMERATED {ms50, ms100, ms150, ms200, ms500, ms1000, ms2000, ms10000},

...

}

IAB-ResourceConfig-r17 ::= SEQUENCE {

iab-ResourceConfigID-r17 IAB-ResourceConfigID-r17,

slotList-r17 SEQUENCE (SIZE (1..5120)) OF INTEGER (0..5119) OPTIONAL, -- Need M

periodicitySlotList-r17 ENUMERATED {ms0p5, ms0p625, ms1, ms1p25, ms2, ms2p5, ms5, ms10, ms20, ms40, ms80, ms160} OPTIONAL, -- Need M

slotListSubcarrierSpacing-r17 SubcarrierSpacing OPTIONAL, -- Need M

...

}

IAB-ResourceConfigID-r17 ::= INTEGER(0..maxNrofIABResourceConfig-1-r17)

ReportUplinkTxDirectCurrentMoreCarrier-r17 ::= SEQUENCE (SIZE(1.. maxSimultaneousBands)) OF IntraBandCC-CombinationReqList-r17

IntraBandCC-CombinationReqList-r17::= SEQUENCE {

servCellIndexList-r17 SEQUENCE (SIZE(1.. maxNrofServingCells)) OF ServCellIndex,

cc-CombinationList-r17 SEQUENCE (SIZE(1.. maxNrofReqComDC-Location-r17)) OF IntraBandCC-Combination-r17

}

IntraBandCC-Combination-r17::= SEQUENCE (SIZE(1.. maxNrofServingCells)) OF CC-State-r17

CC-State-r17::= SEQUENCE {

dlCarrier-r17 CarrierState-r17 OPTIONAL, -- Need N

ulCarrier-r17 CarrierState-r17 OPTIONAL -- Need N

}

CarrierState-r17::= CHOICE {

deActivated-r17 NULL,

activeBWP-r17 INTEGER (0..maxNrofBWPs)

}

AutonomousDenialParameters-r18 ::= SEQUENCE {

autonomousDenialSlots-r18 ENUMERATED {n2, n5, n10, n15, n20, n30, spare2, spare1},

autonomousDenialValidity-r18 ENUMERATED {n200, n500, n1000, n2000}

}

RACH-LessHO-r18 ::= SEQUENCE {

targetNTA-r18 ENUMERATED {zero, source} OPTIONAL, -- Need N

beamIndication-r18 CHOICE {

tci-StateID-r18 TCI-StateId,

ssb-Index-r18 SSB-Index

} OPTIONAL, -- Need N

...

}

UplinkTxSwitchingMoreBands-r18::= SEQUENCE {

uplinkTxSwitchingBandList-r18 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF FreqBandIndicatorNR OPTIONAL, -- Need M

uplinkTxSwitchingBandPairList-r18 UplinkTxSwitchingBandPairList-r18 OPTIONAL, -- Need M

uplinkTxSwitchingAssociatedBandDualUL-List-r18 UplinkTxSwitchingAssociatedBandDualUL-List-r18 OPTIONAL, -- Need M

...

}

UplinkTxSwitchingBandPairList-r18::= SEQUENCE (SIZE (1.. maxULTxSwitchingBandPairs)) OF UplinkTxSwitchingBandPairConfig-r18

UplinkTxSwitchingBandPairConfig-r18::= SEQUENCE {

bandInfoUL1-r18 UplinkTxSwitchingBandIndex-r18,

bandInfoUL2-r18 UplinkTxSwitchingBandIndex-r18,

switchingOptionConfigForBandPair-r18 ENUMERATED {switchedUL, dualUL},

switching2T-Mode-r18 ENUMERATED {enabled} OPTIONAL, -- Need S

switchingPeriodConfigForBandPair-r18 ENUMERATED {n35us, n140us} OPTIONAL, -- Need S

...

}

UplinkTxSwitchingAssociatedBandDualUL-List-r18::= SEQUENCE (SIZE (0..maxSimultaneousBands)) OF UplinkTxSwitchingAssociatedBandDualUL-r18

UplinkTxSwitchingAssociatedBandDualUL-r18::= SEQUENCE {

transmitBand-r18 UplinkTxSwitchingBandIndex-r18,

associatedBand-r18 UplinkTxSwitchingBandIndex-r18

}

UplinkTxSwitchingBandIndex-r18::= INTEGER (1..maxSimultaneousBands)

-- TAG-CELLGROUPCONFIG-STOP

-- ASN1STOP

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| --- |
| *AutonomousDenialParamters* field descriptions |
| ***autonomousDenialSlots***  Indicates the maximum number of the UL slots for which the UE is allowed to deny any UL transmission. Value *n2* corresponds to 2 slots, value *n5* to 5 slots and so on. |
| ***autonomousDenialValidity***  Indicates the validity period over which the UL autonomous denial slots shall be counted. Value *n200* corresponds to 200 slots, value *n500* corresponds to 500 slots and so on. |

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| *CC-State* field descriptions |
| ***dlCarrier***  Indicates DL carrier activation state for this carrier and the related active BWP Index, if activated. |
| ***ulCarrier***  Indicates UL carrier activation state for this carrier and the related active BWP Index, if activated. |

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| --- |
| *CellGroupConfig* field descriptions |
| ***bap-Address***  BAP address of the parent node in cell group. |
| ***bh-RLC-ChannelToAddModList***  Configuration of the backhaul RLC entities and the corresponding MAC Logical Channels to be added and modified. |
| ***bh-RLC-ChannelToReleaseList***  List of the backhaul RLC entities and the corresponding MAC Logical Channels to be released. |
| ***f1c-TransferPath***  The F1-C transfer path that an EN-DC IAB-MT should use for transferring F1-C packets to the IAB-donor-CU. If IAB-MT is configured with *lte*, IAB-MT can only use LTE leg for F1-C transfer. If IAB-MT is configured with *nr*, IAB-MT can only use NR leg for F1-C transfer. If IAB-MT is configured with *both*, it is up to IAB-MT to select an LTE leg or a NR leg for F1-C transfer. If the field is not configured, the IAB node uses the NR leg as the default one. |
| ***f1c-TransferPathNRDC***  The F1-C transfer path that an NR-DC IAB-MT should use for transferring F1-C packets to the IAB-donor-CU. If IAB-MT is configured with *mcg*, IAB-MT can only use the MCG for F1-C transfer. If IAB-MT is configured with *scg*, IAB-MT can only use the SCG for F1-C transfer. If IAB-MT is configured with *both*, it is up to IAB-MT to select the MCG or the SCG for F1-C transfer. |
| ***mac-CellGroupConfig***  MAC parameters applicable for the entire cell group. |
| ***ncr-FwdConfig***  Configuration of side control information for the NCR-Fwd access link. |
| ***nonCollocatedTypeMRDC***  This field is only present for a UE configured with *maxMIMO-Layers* with value less than or equal to 2 for all corresponding serving cells, in case of TDD-TDD inter-band (NG) EN-DC with overlapping or partially overlapping bands. If this field is present, the UE applies (NG)EN-DC MTTD/MRTD according to clause 7.5.3/7.6.3 in TS 38.133 [14] and inter-band RF requirements (i.e. Type 1 UE requirement). If this field is absent, the UE applies (NG)EN-DC MTTD/MRTD according to clause 7.5.2/7.6.2 in TS 38.133 [14] and inter-band RF requirements (i.e. Type 2 UE requirement) when indicating support of *interBandMRDC-WithOverlapDL-Bands-r16*. |
| ***nonCollocatedTypeNR-CA***  This field is only present for a UE configured with *maxMIMO-Layers* with value less than or equal to 2 for all corresponding serving cells, in case of TDD-TDD intra-band NR-CA. If this field is present, the UE applies MRTD according to Table 7.6.4-1 in TS 38.133 [14] and UE RF requirements for intra-band NR-CA except for 7.10A in TS 38.101-1 [15] (i.e. Type 1 UE requirement). If this field is absent, the UE applies MTTD/MRTD requirements according to Table 7.5.4-1/Table 7.6.4-2 in TS 38.133 [14] and UE RF requirements for intra-band non-collocated NR-CA including 7.10A in TS 38.101-1 [15] (i.e. Type 2 UE requirement) when indicating support of *intraBandNR-CA-non-collocated-r18*. |
| ***npn-IdentityInfoList***  This field is used to transfer *npn-IdentityInfoList* in *SIB1* of the SCell. The UE uses this field to translate the *plmn-Index* in MCCH of SCell to SNPN Identity. If this field and *plmn-IdentityInfoList* are both absent, the UE uses the *npn-IdentityInfoList* in *SIB1* of the PCell. |
| ***plmn-IdentityInfoList***  This field is used to transfer *plmn-IdentityInfoList* in *SIB1* of the SCell. The UE uses this field to translate the *plmn-Index* in MCCH of SCell to PLMN Identity. If this field and *npn-IdentityInfoList* are both absent, the UE uses the *plmn-IdentityInfoList* in *SIB1* of the PCell. |
| ***prioSCellPRACH-OverSP-PeriodicSRS***  When configured, the UE applies UL power control prioritization by prioritizing PRACH transmission on SCell over semi-persistent and/or periodic SRS transmission as defined in clause 7.5 of TS 38.213 [13]. |
| ***rlc-BearerToAddModList***  Configuration of the MAC Logical Channel, the corresponding RLC entities and association with radio bearers. |
| ***reportUplinkTxDirectCurrent***  Enables reporting of uplink and supplementary uplink Direct Current location information upon BWP configuration and reconfiguration. This field is only present when the BWP configuration is modified or any serving cell is added or removed. This field is absent in the IE *CellGroupConfig* when provided as part of *RRCSetup* message. If UE is configured with SUL carrier, UE reports both UL and SUL Direct Current locations. |
| ***reportUplinkTxDirectCurrentMoreCarrier***  Enables reporting of uplink Direct Current location information when the UE is configured with intra-band CA. This field is absent in the IE *CellGroupConfig* when provided as part of *RRCSetup* message. The UE only reports the uplink Direct Current location information that are related to the indicated *cc-CombinationList*. The network does not include carriers which locate in DL only spectrum described in TS 38.101-2 [39], clause 5.3A.4 and defined by Fsd according to Table 5.3A.4-3 in FR2 in the *IntraBandCC-CombinationReqList*. I.e. DL-only carrier in FR2 frequency spectrum is not used to calculate the default DC location. |
| ***reportUplinkTxDirectCurrentTwoCarrier***  Enables reporting of uplink Direct Current location information when the UE is configured with uplink intra-band CA with two carriers. This field is absent in the IE *CellGroupConfig* when provided as part of *RRCSetup* message. |
| ***rlc-BearerToReleaseListExt***  List of the RLC entities and the corresponding MAC Logical Channels to be released for multicast MRBs. |
| ***rlmInSyncOutOfSyncThreshold***  BLER threshold pair index for IS/OOS indication generation, see TS 38.133 [14]. *n1* corresponds to the value 1. When the field is absent, the UE applies the value 0. Whenever this is reconfigured, UE resets N310 and N311, and stops T310, if running. Network does not include this field. |
| ***sCellSIB20***  This field is used to transfer *SIB20* of the SCell in order to allow the UE for MBS broadcast reception on SCell. The network configures this field only for a single SCell at a time. |
| ***sCellToAddModList***  List of secondary serving cells (SCells) to be added or modified. |
| ***sCellToReleaseList***  List of secondary serving cells (SCells) to be released. |
| ***simultaneousSpatial-UpdatedList1, simultaneousSpatial-UpdatedList2***  List of serving cells which can be updated simultaneously for spatial relation with a MAC CE. The *simultaneousSpatial-UpdatedList1* and *simultaneousSpatial-UpdatedList2* shall not contain same serving cells. Network should not configure serving cells that are configured with a BWP with two different values for the *coresetPoolIndex* in these lists. |
| ***simultaneousTCI-UpdateList1, simultaneousTCI-UpdateList2***  List of serving cells which can be updated simultaneously for TCI relation with a MAC CE. The *simultaneousTCI-UpdateList1* and *simultaneousTCI-UpdateList2* shall not contain same serving cells. Network should not configure serving cells that are configured with a BWP with two different values for the *coresetPoolIndex* in these lists. |
| ***simultaneousU-TCI-UpdateList1, simultaneousU-TCI-UpdateList2, simultaneousU-TCI-UpdateList3, simultaneousU-TCI-UpdateList4***  List of serving cells for which the Unified TCI States Activation/Deactivation MAC CE, the Enhanced Unified TCI States Activation/Deactivation MAC CE for Joint TCI States or the Enhanced Unified TCI States Activation/Deactivation MAC CE for Separate TCI States apply simultaneously, as specified in TS 38.321 [3] clauses 6.1.3.47, 6.1.3.70 and 6.1.3.71, respectively. The different lists shall not contain same serving cells. Network only configures in these lists serving cells that are configured with *unifiedTCI-StateType*. Network should not configure serving cells that are configured with a BWP with different number of *coresetPoolIndexes* in the same list. |
| ***spCellConfig***  Parameters for the SpCell of this cell group (PCell of MCG or PSCell of SCG). |
| ***uplinkTxSwitchingOption***  Indicates which option is configured for dynamic UL Tx switching for inter-band UL CA or (NG)EN-DC. The field is set to *switchedUL* if network configures option 1 as specified in TS 38.214 [19], or *dualUL* if network configures option 2 as specified in TS 38.214 [19]. Network always configures UE with a value for this field in inter-band UL CA case and (NG)EN-DC case where UE supports dynamic UL Tx switching. |
| ***uplinkTxSwitchingPowerBoosting***  Indicates whether the UE is allowed to enable 3dB boosting on the maximum output power for transmission on carrier2 under the operation state in which 2-port transmission can be supported on carrier2 for inter-band UL CA case with dynamic UL Tx switching as defined in TS 38.101-1 [15]. Network can only configure this field for dynamic UL Tx switching in inter-band UL CA case with power Class 3 as defined in TS 38.101-1 [15]. |
| ***uplinkTxSwitching-2T-Mode***  Indicates 2Tx-2Tx switching mode is configured for inter-band UL CA or SUL, in which the switching gap duration for a triggered uplink switching (as specified in TS 38.214 [19]) is equal to the switching time capability value reported for the switching mode.  If this field is absent and *uplinkTxSwitching* is configured, it is interpreted that 1Tx-2Tx UL Tx switching is configured as specified in TS 38.214 [19]. In this case, there is one uplink (or one uplink band in case of intra-band) configured with *uplinkTxSwitching*, on which the maximum number of antenna ports among all configured P-SRS/A-SRS and activated SP-SRS resources should be 1 and non-codebook based UL MIMO is not configured. |
| ***uplinkTxSwitching-DualUL-TxState***  Indicates the state of Tx chains if the state of Tx chains after the UL Tx switching is not unique (as specified in TS 38.214 [19]) in case of 2Tx-2Tx switching is configured and *uplinkTxSwitchingOption* is set to *dualUL*. Value *oneT* indicates 1Tx is assumed to be supported on the carriers on each band, value *twoT* indicates 2Tx is assumed to be supported on that carrier.  This field applies for all band pairs if *uplinkTxSwitchingMoreBands* is configured. |
| ***uplinkTxSwitchingMoreBands***  Indicates UL band list, band pair list and other configurations for ULTx switching. |
| ***uu-RelayRLC-ChannelToAddModList***  List of the Uu RLC entities and the corresponding MAC Logical Channels to be added or modified. |
| ***uu-RelayRLC-ChannelToReleaseList***  List of the Uu RLC entities and the corresponding MAC Logical Channels to be released. |

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| *DeactivatedSCG-Config* field descriptions |
| ***bfd-and-RLM***  If the field is set to *true*, the UE shall perform RLM and BFD on the PSCell when the SCG is deactivated and the network ensures that *beamFailure-r17* is not configured in the *radioLinkMonitoringConfig* of the DL BWP of the PSCell in which the UE performs BFD. If set to *false*, the UE is not required to perform RLM and BFD on the PSCell when the SCG is deactivated. |

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| *DAPS-UplinkPowerConfig* field descriptions |
| ***p-DAPS-Source***  The maximum total transmit power to be used by the UE in the source cell group during DAPS handover. |
| ***p-DAPS-Target***  The maximum total transmit power to be used by the UE in the target cell group during DAPS handover. |
| ***uplinkPowerSharingDAPS-Mode***  Indicates the uplink power sharing mode that the UE uses in DAPS handover (see TS 38.213 [13]). |

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| *GoodServingCellEvaluation* field descriptions |
| ***offset***  The parameter "X" (dB) for the good serving cell quality criterion in RRC\_CONNECTED, for a cell operating in FR1 and FR2, respectively. If this field is absent, the UE applies the (default) value of 0 dB for "X". |

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| *IAB-ResourceConfig* field descriptions |
| ***iab-ResourceConfigID***  This ID is used to indicate the specific resource configuration addressed by the MAC CEs specified in TS 38.321 [3]. |
| ***periodicitySlotList***  Indicates the periodicity in ms of the list of slot indexes indicated in *slotList*. |
| ***slotList***  Indicates the list of slot indexes to which the information indicated in the specific MAC CE applies to, as specified in TS 38.321 [3]. The values of the entries in the *slotList* are strictly less than the value of the *periodicitySlotList*. |
| ***slotListSubcarrierSpacing***  Subcarrier spacing used as reference for the *slotList* configuration.  Only the following values are applicable depending on the used frequency:  FR1: 15 or 30 kHz  FR2-1: 60 or 120 kHz  FR2-2: 120 or 480 kHz |

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| *RACH-LessHO* field descriptions |
| ***ssb-Index***  This field indicates a beam that the UE should use in the target cell to monitor PDCCH for initial uplink transmission, see TS 38.321 [3]. The network configures this field when *cg-RRC-Configuration* is not configured for the initial uplink transmission in RACH-less handover in NTN or in case this cell is not a mobile IAB cell. |
| ***targetNTA***  This field refers to the timing adjustment, see TS 38.213 [13] and TS 38.321 [3], indicating the NTA value which the UE shall use for the target PTAG of handover. The value *zero* corresponds to NTA=0, while the value *source* corresponds to the NTA value of the source PTAG indicated by the *tag-Id*. Only value *source* is configured by the network in case source cell is a mobile IAB cell. In this version of the specification, the network shall always configure this field if *rach-LessHO* is part of an *RRCReconfiguration* message. |
| ***tci-StateID***  This field indicates a beam that the UE should use in the target cell to monitor PDCCH for initial uplink transmission and also indicates the TCI state information to be used in the target cell. The network configures this field in case this cell is not a NTN cell. |

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| *ReconfigurationWithSync* field descriptions |
| ***rach-ConfigDedicated***  Random access configuration to be used for the reconfiguration with sync (e.g. handover). The UE performs the RA according to these parameters in the *firstActiveUplinkBWP* (see *UplinkConfig*). |
| ***sl-IndirectPathMaintain***  Indicates that the L2 U2N Remote UE keeps the PC5 connection with its connected L2 U2N Relay UE. |
| ***smtc***  The SSB periodicity/offset/duration configuration of target cell for NR PSCell change and NR PCell change. The network sets the *periodicityAndOffset* to indicate the same periodicity as *ssb-periodicityServingCell* in *spCellConfigCommon* or sets to the same periodicity as *ssb-Periodicity-r17* in *nonCellDefiningSSB-r17* if the first active DL BWP included in this RRC message is configured with *nonCellDefiningSSB-r17*.  For case of NR PCell change, the *smtc* is based on the timing reference of (source) PCell. For case of NR PSCell change, it is based on the timing reference of source PSCell.  If both this field and *targetCellSMTC-SCG* are absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. If the first active DL BWP included in this RRC message is configured with *nonCellDefiningSSB-r17*, this field corresponds to the NCD-SSB indicated by *nonCellDefiningSSB-r17*, otherwise, this field corresponds to the CD-SSB indicated by *absoluteFrequencySSB* in *frequencyInfoDL*. |

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| *ReportUplinkTxDirectCurrentMoreCarrier* field descriptions |
| ***IntraBandCC-Combination***  Indicates the state of the carriers and BWPs indexes of the carriers in a CC combination, each carrier in this combination corresponds to an entry in *servCellIndexList* with same order. This IE shall have the same size as *servCellIndexList*. |
| ***IntraBandCC-CombinationReqList***  Indicates the list of the requested carriers/BWPs combinations for an intra-band CA component. |
| ***servCellIndexList***  indicates the list of cell index for an intra-band CA component. |

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| *SCellConfig* field descriptions |
| ***goodServingCellEvaluationBFD***  Indicates the criterion for a UE to detect the good serving cell quality for BFD relaxation in an SCell in RRC\_CONNECTED. This field is always configured when the network enables BFD relaxation for the UE in this SCell. This field is absent if *failureDetectionSetN* is present for the SCell. |
| ***preConfGapStatus***  Indicates whether the pre-configured measurement gaps (i.e. the gaps configured with *preConfigInd*) are activated or deactivated while this SCell is deactivated. If this field is configured, the UE shall apply network-controlled mechanism for activation and deactivation of the pre-configured measurement gaps, otherwise the UE shall apply the autonomous activation/deactivation mechanism, as specified in TS 38.133 [14]. The first/leftmost bit corresponds to the measurement gap with gap ID 1, the second bit corresponds to measurement gap with gap ID 2, and so on. Value 0 indicates that the corresponding pre-configured measurement gap is deactivated while value 1 indicates that the corresponding pre-configured measurement gap is activated. The UE shall ignore the bit if the corresponding measurement gap is not a pre-configured measurement gap. |
| ***sCellState***  Indicates whether the SCell shall be considered to be in activated state upon SCell configuration. If the field is included for an SCell configured with TRS for fast activation of the SCell, such TRS is not used for the corresponding SCell. |
| ***secondaryDRX-GroupConfig***  The field is used to indicate whether the SCell belongs to the secondary DRX group. All serving cells in the secondary DRX group shall belong to one Frequency Range and all serving cells in the default DRX group shall belong to another Frequency Range. If *drx-ConfigSecondaryGroup* is configured, the field is optionally present. The network always includes the field if the field was previously configured for this SCell and the SCell remains in the secondary DRX group. Removal of an individual SCell from the secondary DRX group is supported by using an SCell release and addition. Otherwise, if *drx-ConfigSecondaryGroup* is not configured, the field is absent and the UE shall release the field. The UE shall also release the field if *drx-ConfigSecondaryGroup* is released without including *sCellToAddModList*. |
| ***smtc***  The SSB periodicity/offset/duration configuration of target cell for NR SCell addition. The network sets the *periodicityAndOffset* to indicate the same periodicity as *ssb-periodicityServingCell* in *sCellConfigCommon*. The *smtc* is based on the timing of the SpCell of associated cell group. In case of inter-RAT handover to NR, the timing reference is the NR PCell. In case of intra-NR PCell change (standalone NR) or NR PSCell change (EN-DC), the timing reference is the target SpCell. If the field is absent and *absoluteFrequencySSB* is included, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message. If the SCell is an SSB-less SCell (i.e., the IE *absoluteFrequencySSB* in *ServingCellConfigCommon* is absent), this field is absent. |

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| *SpCellConfig* field descriptions |
| ***deactivatedSCG-Config***  Configuration applicable when the SCG is deactivated. The network always configures this field before or when indicating that the SCG is deactivated in an *RRCReconfiguration*, *RRCResume*, E-UTRA *RRCConnectionReconfiguration* or E-UTRA *RRCConnectionResume* message. |
| ***goodServingCellEvaluationBFD***  Indicates the criterion for a UE to detect the good serving cell quality for BFD relaxation in the SpCell in RRC\_CONNECTED. The field is always configured when the network enables BFD relaxation for the UE in this SpCell. This field is absent if *failureDetectionSetN* is present for the SpCell. |
| ***goodServingCellEvaluationRLM***  Indicates the criterion for a UE to detect the good serving cell quality for RLM relaxation in the SpCell in RRC\_CONNECTED. The field is always configured when the network enables RLM relaxation for the UE in this SpCell. |
| ***lowMobilityEvaluationConnected***  Indicates the criterion for a UE to detect low mobility in RRC\_CONNECTED in an SpCell. The *s-SearchDeltaP-Connected* is the parameter "SSearchDeltaP-connected". Value *dB*3 corresponds to 3 dB, *dB*6 corresponds to 6 dB and so on. The *t-SearchDeltaP-Connected* is the parameter "TSearchDeltaP-Connected". Value *s5* means 5 seconds, value *s10* means 10 seconds and so on. Low mobility criterion is configured in NR PCell for the case of NR SA/ NR CA/ NE-DC/NR-DC, and in the NR PSCell for the case of EN-DC. |
| ***reconfigurationWithSync***  Parameters for the synchronous reconfiguration to the target SpCell. |
| ***rlf-TimersAndConstants***  Timers and constants for detecting and triggering cell-level radio link failure. For the SCG, *rlf-TimersAndConstants* can only be set to *setup* and is always included at SCG addition. |
| ***servCellIndex***  Serving cell ID of a PSCell. The PCell of the Master Cell Group uses ID = 0. |

|  |
| --- |
| *SL-PathSwitchConfig* field descriptions |
| ***targetRelayUE-Identity***  Indicates the L2 source ID of the target L2 U2N Relay UE during path switch. |
| ***t420***  Indicates the timer value of *T420* to be used during path switch. |

|  |
| --- |
| *UplinkTxSwitchingMoreBands* field descriptions |
| ***uplinkTxSwitchingBandList***  Indicates the NR frequency band number of the UL bands for UL Tx switching. If the UE needs to determine location of switching period as specified in TS 38.101-1 [15], the UE considers that the bands are listed in decreasing order of priority, i.e. the first/leftmost entry corresponds to the band with the highest priority, the next entry corresponds to the band with the second highest priority, and so on. The last entry corresponds the band with the lowest priority. |
| ***uplinkTxSwitchingBandPairList***  Indicates the band pairs involved in UL Tx switching, as well as the per band pair configurations. |
| ***uplinkTxSwitchingAssociatedBandDualUL-List***  Indicates the associated band for the transmitting band indicated by *transmitBand* which the transmitting carrier(s) is on as specified in TS 38.214 [19], clause 6.1.6. The network ensures that each band pair of a transmitting band and an associated band supports the *dualUL* switching option. |
| ***UplinkTxSwitchingBandIndex***  The value n indicates the band included at the n-th entry of *uplinkTxSwitchingBandList*. |

|  |
| --- |
| *UplinkTxSwitchingBandPairConfig* field descriptions |
| ***bandInfoUL1, bandInfoUL2***  Indicates the band index for a band pair. The value n indicates the band included at the n-th entry of *uplinkTxSwitchingBandList*. |
| ***switching2T-Mode***  Indicates 2Tx-2Tx switching mode is configured to the band pair.  If this field is absent when uplink Tx switching is configured, it is interpreted that 1Tx-2Tx/1Tx-1Tx UL Tx switching is configured as specified in TS 38.214 [19]. |
| ***switchingOptionConfigForBandPair***  Indicates the switching option for the band pair as specified in TS 38.214 [19], clause 6.1.6. |
| ***switchingPeriodConfigForBandPair***  Indicates the value of switching period for the band pair as specified in TS 38.214 [19], clause 6.1.6. Value *n35us* represents 35 us, *n140us* represents 140us. If the field is absent, 210 us is applied. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *2Tx* | The field is optionally present, Need R, if *uplinkTxSwitching* is configured; otherwise it is absent, Need R. |
| *BWP-Reconfig* | The field is optionally present, Need N, if the BWPs are reconfigured or if serving cells are added or removed. Otherwise it is absent. |
| *DirectToIndirect-PathSwitch* | The field is mandatory present for the L2 U2N remote UE at path switch to the target L2 U2N Relay UE (including direct to indirect path switch, single-hop indirect to single-hop indirect path switch, multi-hop indirect to single-hop indirect path switch and direct/single-hop indirect to multi-hop indirect path switch). It is absent otherwise.  Note: the target L2 U2N Relay UE should not be the same as serving L2 U2N Relay UE for inter-gNB indirect to indirect path switch. |
| *MP* | This field is optionally present, Need N, if a L2 U2N remote UE is configured to perform MP direct path addition during indirect-to-direct path swith procedure, or to perform MP direct path release during direct-to-indirect path switch procedure. It is absent otherwise. |
| *NCR* | The field is optionally present, Need M, for NCR-MT. It is absent otherwise. |
| *PreConfigMG* | The field is optionally present, Need R, if there is at least one per UE gap configured with *preConfigInd* or there is at least one per FR gap of the same FR which the SCell belongs to and configured with *preConfigInd*. It is absent, Need R, otherwise. |
| *ReconfWithSync* | The field is mandatory present in the *RRCReconfiguration* message:  - in each configured *CellGroupConfig* for which the SpCell changes,  - in the *masterCellGroup:*  - at change of AS security key derived from KgNB,  - in an *RRCReconfiguration* message contained in a *DLInformationTransferMRDC* message,  - path switch of L2 U2N remote UE to the target PCell,  - path switch of L2 U2N remote UE to the target L2 U2N Relay UE,  - in the *secondaryCellGroup* at:  - PSCell addition,  - SCG resume with NR-DC or (NG)EN-DC,  - update of required SI for PSCell,  - change of AS security key derived from S-KgNB in NR-DC while the UE is configured with at least one radio bearer with *keyToUse* set to *secondary* and that is not released by this *RRCReconfiguration* message,  - MN handover in (NG)EN-DC.  Otherwise, it is optionally present, need M. The field is absent in the *masterCellGroup* in *RRCResume* and *RRCSetup* messages and is absent in the *masterCellGroup* in *RRCReconfiguration* messages if source configuration is not released during DAPS handover. |
| *SCellAdd* | The field is mandatory present upon SCell addition; otherwise it is absent, Need M. |
| *SCellAddMod* | The field is mandatory present upon SCell addition; otherwise it is optionally present, need M. |
| *SCellAddSync* | The field is optionally present, Need N:  - in the *masterCellGroup* at  - SCell addition,  - reconfiguration with sync,  - resume of an RRC connection.  - in the *secondaryCellGroup*, when the SCG is not indicated as deactivated at:  - SCG activation while the SCG was previously deactivated,  - SCell addition,  - reconfiguration with sync.  It is absent otherwise. |
| *SCG* | The field is mandatory present in an *SpCellConfig* for the PSCell. It is absent otherwise. |
| *SCellSIB20-Opt* | This field is optionally present, Need M, if the field sCellSIB20 is configured. It is absent otherwise. |
| *SCG-Opt* | The field is optionally present, Need M, in an SpCellConfig for the PSCell. It is absent otherwise. |

NOTE: In case of change of AS security key derived from S-KgNB/S-KeNB, if *reconfigurationWithSync* is not included in the *masterCellGroup*, the network releases all existing MCG RLC bearers associated with a radio bearer with *keyToUse* set to *secondary*. In case of change of AS security key derived from KgNB/KeNB, if *reconfigurationWithSync* is not included in the *secondaryCellGroup*, the network releases all existing SCG RLC bearers associated with a radio bearer with *keyToUse* set to *master*.

=================================NEXT CHANGE=======================================

#### *– ReportConfigInterRAT*

The IE *ReportConfigInterRAT* specifies criteria for triggering of an inter-RAT measurement reporting event, or an L2 U2N relay measurement reporting event. The inter-RAT measurement reporting events for E-UTRA and UTRA-FDD are labelled B*N* with *N* equal to 1, 2 and so on. The measurement reporting events for L2 U2N relay UE are labelled Y*N* with *N* equal to 1, 2 and so on, and Z1.

Event B1: Neighbour becomes better than absolute threshold;

Event B2: PCell becomes worse than absolute threshold1 AND Neighbour becomes better than another absolute threshold2;

Event Y1: PCell becomes worse than absolute threshold1 AND candidate L2 U2N Relay UE becomes better than another absolute threshold2;

Event Y2: Candidate L2 U2N Relay UE becomes better than absolute threshold;

Event Z1: Serving L2 U2N Relay UE becomes worse than absolute threshold1 AND candidate L2 U2N Relay UE becomes better than another absolute threshold2;

*ReportConfigInterRAT* information element

-- ASN1START

-- TAG-REPORTCONFIGINTERRAT-START

ReportConfigInterRAT ::= SEQUENCE {

reportType CHOICE {

periodical PeriodicalReportConfigInterRAT,

eventTriggered EventTriggerConfigInterRAT,

reportCGI ReportCGI-EUTRA,

...,

reportSFTD ReportSFTD-EUTRA

}

}

ReportCGI-EUTRA ::= SEQUENCE {

cellForWhichToReportCGI EUTRA-PhysCellId,

...,

[[

useAutonomousGaps-r16 ENUMERATED {setup} OPTIONAL -- Need R

]]

}

ReportSFTD-EUTRA ::= SEQUENCE {

reportSFTD-Meas BOOLEAN,

reportRSRP BOOLEAN,

...

}

EventTriggerConfigInterRAT ::= SEQUENCE {

eventId CHOICE {

eventB1 SEQUENCE {

b1-ThresholdEUTRA MeasTriggerQuantityEUTRA,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

...

},

eventB2 SEQUENCE {

b2-Threshold1 MeasTriggerQuantity,

b2-Threshold2EUTRA MeasTriggerQuantityEUTRA,

reportOnLeave BOOLEAN,

hysteresis Hysteresis,

timeToTrigger TimeToTrigger,

...

},

...,

[[

eventB1-UTRA-FDD-r16 SEQUENCE {

b1-ThresholdUTRA-FDD-r16 MeasTriggerQuantityUTRA-FDD-r16,

reportOnLeave-r16 BOOLEAN,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger,

...

},

eventB2-UTRA-FDD-r16 SEQUENCE {

b2-Threshold1-r16 MeasTriggerQuantity,

b2-Threshold2UTRA-FDD-r16 MeasTriggerQuantityUTRA-FDD-r16,

reportOnLeave-r16 BOOLEAN,

hysteresis-r16 Hysteresis,

timeToTrigger-r16 TimeToTrigger,

...

}

]],

[[

eventY1-Relay-r17 SEQUENCE {

y1-Threshold1-r17 MeasTriggerQuantity,

y1-Threshold2-Relay-r17 SL-MeasTriggerQuantity-r16,

reportOnLeave-r17 BOOLEAN,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger,

...

},

eventY2-Relay-r17 SEQUENCE {

y2-Threshold-Relay-r17 SL-MeasTriggerQuantity-r16,

reportOnLeave-r17 BOOLEAN,

hysteresis-r17 Hysteresis,

timeToTrigger-r17 TimeToTrigger,

...

}

]],

[[

eventZ1-Relay-r18 SEQUENCE {

z1-Threshold1-Relay-r18 SEQUENCE {

sl-RSRP-r18 SL-MeasTriggerQuantity-r16,

sd-RSRP-r18 SL-MeasTriggerQuantity-r16 OPTIONAL -- Need S

},

z1-Threshold2-Relay-r18 SL-MeasTriggerQuantity-r16,

reportOnLeave-r18 BOOLEAN,

hysteresis-r18 Hysteresis,

timeToTrigger-r18 TimeToTrigger,

...

}

]]

},

rsType NR-RS-Type,

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantity MeasReportQuantity,

maxReportCells INTEGER (1..maxCellReport),

...,

[[

reportQuantityUTRA-FDD-r16 MeasReportQuantityUTRA-FDD-r16 OPTIONAL -- Need R

]],

[[

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

includeBT-Meas-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

includeWLAN-Meas-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

includeSensor-Meas-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL -- Need M

]],

[[

reportQuantityRelay-r17 SL-MeasReportQuantity-r16 OPTIONAL -- Need R

]],

[[

cellIndividualOffsetList-r18 SEQUENCE (SIZE (1..maxCellMeasEUTRA)) OF CellIndividualOffsetList-EUTRA-r18 OPTIONAL -- Need R

]]

}

PeriodicalReportConfigInterRAT ::= SEQUENCE {

reportInterval ReportInterval,

reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity},

reportQuantity MeasReportQuantity,

maxReportCells INTEGER (1..maxCellReport),

...,

[[

reportQuantityUTRA-FDD-r16 MeasReportQuantityUTRA-FDD-r16 OPTIONAL -- Need R

]],

[[

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

includeBT-Meas-r16 SetupRelease {BT-NameList-r16} OPTIONAL, -- Need M

includeWLAN-Meas-r16 SetupRelease {WLAN-NameList-r16} OPTIONAL, -- Need M

includeSensor-Meas-r16 SetupRelease {Sensor-NameList-r16} OPTIONAL -- Need M

]],

[[

reportQuantityRelay-r17 SL-MeasReportQuantity-r16 OPTIONAL -- Need R

]]

}

MeasTriggerQuantityUTRA-FDD-r16 ::= CHOICE{

utra-FDD-RSCP-r16 INTEGER (-5..91),

utra-FDD-EcN0-r16 INTEGER (0..49)

}

MeasReportQuantityUTRA-FDD-r16 ::= SEQUENCE {

cpich-RSCP BOOLEAN,

cpich-EcN0 BOOLEAN

}

CellIndividualOffsetList-EUTRA-r18 ::= SEQUENCE {

physCellId-r18 EUTRA-PhysCellId,

cellIndividualOffset-r18 EUTRA-Q-OffsetRange,

carrierFreq-r18 ARFCN-ValueEUTRA OPTIONAL -- Need R

}

-- TAG-REPORTCONFIGINTERRAT-STOP

-- ASN1STOP

|  |
| --- |
| *ReportConfigInterRAT field descriptions* |
| ***reportType***  Type of the configured measurement report. In (NG)EN-DC, and NR-DC, network does not configure report of type *ReportCGI-EUTRA* for SCG. |

|  |
| --- |
| *ReportCGI-EUTRA field descriptions* |
| ***useAutonomousGaps***  Indicates whether or not the UE is allowed to use autonomous gaps in acquiring system information from the E-UTRAN neighbour cell. When the field is included, the UE applies the corresponding value for T321. |

|  |
| --- |
| *EventTriggerConfigInterRAT* field descriptions |
| ***b2-Threshold1***  NR threshold to be used in inter RAT measurement report triggering condition for event B2. |
| ***bN-ThresholdEUTRA***  E-UTRA threshold value associated with the selected trigger quantity (RSRP, RSRQ, SINR) to be used in inter RAT measurement report triggering condition for event number bN. In the same *eventB2*, the network configures the same CHOICE name (*rsrp*, *rsrq* or *sinr*) for the *MeasTriggerQuantity* of the *b2-Threshold1* and for the *MeasTriggerQuantityEUTRA* of the *b2-Threshold2EUTRA*. |
| ***eventId***  Choice of inter RAT event triggered reporting criteria. |
| ***maxReportCells***  Max number of non-serving cells/candidate L2 U2N Relay UEs to include in the measurement report. |
| ***reportAmount***  *Number* of measurement reports applicable for *eventTriggered* as well as for *periodical* report types |
| ***reportOnLeave***  Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a cell in *cellsTriggeredList* or for a L2 U2N Relay UE in *relaysTriggeredList*, as specified in 5.5.4.1. |
| ***reportQuantity, reportQuantityUTRA-FDD***  The cell measurement quantities to be included in the measurement report. If the field *eventB1-UTRA-FDD* or *eventB2-UTRA-FDD* is present, the UE shall ignore the value(s) provided in *reportQuantity*. |
| ***reportQuantityRelay***  The L2 U2N Relay UE measurement quantity to be included in measurement report. |
| ***timeToTrigger***  Time during which specific criteria for the event needs to be met in order to trigger a measurement report. |
| ***bN-ThresholdUTRA-FDD***  UTRA-FDD threshold value associated with the selected trigger quantity (RSCP, EcN0) to be used in inter RAT measurement report triggering condition for event number bN.  *utra-FDD-RSCP* corresponds to CPICH\_RSCP in TS 25.133 [46] for FDD. *utra-FDD-EcN0* corresponds to CPICH\_Ec/No in TS 25.133 [46] for FDD.  For *utra-FDD-RSCP*: The actual value is field value – 115 dBm.  For *utra-FDD-EcN0*: The actual value is (field value – 49)/2 dB. |
| ***y1-Threshold1***  NR threshold to be used in measurement report triggering condition for event Y1. |
| ***y1-Threshold2-Relay***  L2 U2N Relay threshold value associated with the selected trigger quantity (i.e. RSRP) to be used in measurement report triggering condition for event Y1. |
| ***y2-Threshold-Relay***  L2 U2N Relay threshold value associated with the selected trigger quantity (i.e. RSRP) to be used in measurement report triggering condition for event Y2. |
| ***z1-Threshold1-Relay***  L2 U2N Relay threshold value associated with the selected trigger quantity (i.e. SL-RSRP and/or SD-RSRP) to be used in measurement report triggering condition for serving Relay UE in event Z1. If the field sd-RSRP is not included, the UE considers it to be equal to sl-RSRP. |
| ***z1-Threshold2-Relay***  L2 U2N Relay threshold value associated with the selected trigger quantity (i.e. SD-RSRP) to be used in measurement report triggering condition for candidate Relay UE in event Z1. |

|  |
| --- |
| *PeriodicalReportConfigInterRAT* field descriptions |
| ***maxReportCells***  Max number of non-serving cells/candidate L2 U2N Relay UEs to include in the measurement report. |
| ***reportAmount***  Number of measurement reports applicable for *eventTriggered* as well as for *periodical* report types |
| ***reportQuantity, reportQuantityUTRA-FDD***  The cell measurement quantities to be included in the measurement report. If the field *reportQuantityUTRA-FDD* is present, the UE shall ignore the value(s) provided in *reportQuantity*. |

|  |
| --- |
| *CellIndividualOffsetList-EUTRA* field descriptions |
| ***carrierFreq***  Indicates the EUTRA frequency for which *cellIndividualOffset* is applicable. If the field is not configured, the EUTRA frequency indicated by *carrierFreq* within the *MeasObjectEUTRA* of the *measID* associated with this *ReportConfigInterRAT* applies. |
| ***cellIndividualOffset***  Cell individual offsets applicable to a specific measurement event. If this field is present, the UE, for the same cell, shall ignore the cell individual offset configured within the *MeasObjectEUTRA* of the *measID* associated with this *ReportConfigInterRAT*. |
| ***physCellId***  Physical cell identity of a E-UTRAN cell in the cell list. |

=================================NEXT CHANGE=======================================

#### – UE-TimersAndConstantsRemoteUE

The IE *UE-TimersAndConstantsRemoteUE* contains timers and constants used by the L2 U2N Remote UE in RRC\_CONNECTED, RRC\_INACTIVE and RRC\_IDLE.

*UE-TimersAndConstantsRemoteUE* information element

-- ASN1START

-- TAG-UE-TIMERSANDCONSTANTSREMOTEUE-START

UE-TimersAndConstantsRemoteUE-r17 ::= SEQUENCE {

t300-RemoteUE-r17 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need S

t301-RemoteUE-r17 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need S

t319-RemoteUE-r17 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need S

...

}

-- TAG-UE-TIMERSANDCONSTANTSREMOTEUE-STOP

-- ASN1STOP

|  |
| --- |
| *UE-TimersAndConstantsRemoteUE* field descriptions |
| ***t300-RemoteUE***  Indicates the timer value of T300 used by L2 U2N Remote UE. If the field is absent, the timer value indicated in t300 applies to L2 U2N Remote UE [RIL]: H453, SLRelay. The effective T300 value for the L2 U2N Remote UE, accounting for both the Uu and PC5 hop components,, is obtained by multiplying the base T300 timer value by the Hop Count. For a single-hop scenario involving one Relay UE, the Hop Count is 1. For multi-hop scenarios involving two or three Relay UEs, the Hop Count is 2 or 3, respectively. [RIL]: H453, SLRelay |
| ***t301-RemoteUE***  Indicates the timer value of T301 used by L2 U2N Remote UE. If the field is absent, the timer value indicated in t301 applies to L2 U2N Remote UE [RIL]: H453, SLRelay. The effective T301 value for the L2 U2N Remote UE, accounting for both the Uu and PC5 hop components, is obtained by multiplying the base T301 timer value by the Hop Count. For a single-hop scenario involving one Relay UE, the Hop Count is 1. For multi-hop scenarios involving two or three Relay UEs, the Hop Count is 2 or 3, respectively. [RIL]: H453, SLRelay |
| ***t319-RemoteUE***  Indicates the timer value of T319 used by L2 U2N Remote UE. If the field is absent, the timer value indicated in t319 applies to L2 U2N Remote UE [RIL]: H453, SLRelay. The effective T319 value for the L2 U2N Remote UE, accounting for both the Uu and PC5 hop components,, is obtained by multiplying the base T319 timer value by the Hop Count. For a single-hop scenario involving one Relay UE, the Hop Count is 1. For multi-hop scenarios involving two or three Relay UEs, the Hop Count is 2 or 3, respectively. [RIL]: H453, SLRelay |

=================================NEXT CHANGE=======================================

#### – *Uu-RelayRLC-ChannelConfig*

The IE *Uu-RelayRLC-ChannelConfig* is used to configure an RLC entity, a corresponding logical channel in MAC for Uu Relay RLC channel between L2 U2N Relay UE and network, or between a N3C relay UE and network in case of MP.

*Uu-RelayRLC-ChannelConfig* information element

-- ASN1START

-- TAG-UU-RELAYRLC-CHANNELCONFIG-START

Uu-RelayRLC-ChannelConfig-r17::= SEQUENCE {

uu-LogicalChannelIdentity-r17 LogicalChannelIdentity OPTIONAL, -- Cond RelayLCH-SetupOnly

uu-RelayRLC-ChannelID-r17 Uu-RelayRLC-ChannelID-r17,

reestablishRLC-r17 ENUMERATED {true} OPTIONAL, -- Need N

rlc-Config-r17 RLC-Config OPTIONAL, -- Cond RelayLCH-Setup

mac-LogicalChannelConfig-r17 LogicalChannelConfig OPTIONAL, -- Cond RelayLCH-Setup

...

}

-- TAG-UU-RELAYRLC-CHANNELCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *Uu-RelayRLC-ChannelConfig* field descriptions |
| ***uu-LogicalChannelIdentity***  Indicates the logical channel id for Uu Relay RLC channel of the L2 U2N Relay UE or of the L2 Last U2N Relay UE. |
| ***uu-RelayRLC-ChannelID***  Indicates the Uu Relay RLC channel in the link between L2 U2N Relay UE and network or between L2 Last U2N Relay UE and network. |
| ***reestablishRLC***  Indicates that RLC should be re-established. |
| ***rlc-Config***  Determines the RLC mode (UM, AM) and provides corresponding parameters. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *RelayLCH-Setup* | This field is mandatory present upon creation of a new logical channel for a Uu Relay RLC channel. It is optionally present, Need M, otherwise. |
| *RelayLCH-SetupOnly* | This field is mandatory present upon creation of a new logical channel for a Uu Relay RLC channel. It is absent otherwise. |

#### – *Uu-RelayRLC-ChannelID*

The IE *Uu-RelayRLC-ChannelID* is used to identify a Uu Relay RLC channel in the link between L2 U2N Relay UE and network or between L2 Last U2N Relay UE and network.

*Uu-RelayRLC-ChannelID* information element

-- ASN1START

-- TAG-UU-RELAYRLC-CHANNELID-START

Uu-RelayRLC-ChannelID-r17 ::= INTEGER (1..maxLC-ID)

-- TAG-UU-RELAYRLC-CHANNELID-STOP

-- ASN1STOP

=================================NEXT CHANGE=======================================

### 6.3.3 UE capability information elements

=================================NEXT CHANGE=======================================

#### – *SidelinkParameters*

The IE *SidelinkParameters* is used to convey capabilities related to NR and V2X sidelink communications/positioning.

*SidelinkParameters* information element

-- ASN1START

-- TAG-SIDELINKPARAMETERS-START

SidelinkParameters-r16 ::= SEQUENCE {

sidelinkParametersNR-r16 SidelinkParametersNR-r16 OPTIONAL,

sidelinkParametersEUTRA-r16 SidelinkParametersEUTRA-r16 OPTIONAL

}

SidelinkParametersNR-r16 ::= SEQUENCE {

rlc-ParametersSidelink-r16 RLC-ParametersSidelink-r16 OPTIONAL,

mac-ParametersSidelink-r16 MAC-ParametersSidelink-r16 OPTIONAL,

fdd-Add-UE-Sidelink-Capabilities-r16 UE-SidelinkCapabilityAddXDD-Mode-r16 OPTIONAL,

tdd-Add-UE-Sidelink-Capabilities-r16 UE-SidelinkCapabilityAddXDD-Mode-r16 OPTIONAL,

supportedBandListSidelink-r16 SEQUENCE (SIZE (1..maxBands)) OF BandSidelink-r16 OPTIONAL,

...,

[[

relayParameters-r17 RelayParameters-r17 OPTIONAL

]],

[[

-- R1 32-x: Use of new P0 parameters for open loop power control

p0-OLPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

]],

[[

pdcp-ParametersSidelink-r18 PDCP-ParametersSidelink-r18 OPTIONAL,

--R1 41-1-1a: Common SL-PRS processing capability

sl-PRS-CommonProcCapabilityPerUE-r18 SEQUENCE {

maxNumOfActiveSL-PRS-Resources-r18 SEQUENCE {

fr1-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24} OPTIONAL,

fr2-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64, n128} OPTIONAL

},

maxNumOfSlotswithActiveSL-PRS-Resources-r18 SEQUENCE {

fr1-r18 ENUMERATED {n1, n2, n3, n4, n6, n8} OPTIONAL,

fr2-r18 ENUMERATED {n1, n2, n4, n8, n12, n16, n24, n32, n48, n64} OPTIONAL

}

} OPTIONAL

]]

}

SidelinkParametersEUTRA-r16 ::= SEQUENCE {

sl-ParametersEUTRA1-r16 OCTET STRING OPTIONAL,

sl-ParametersEUTRA2-r16 OCTET STRING OPTIONAL,

sl-ParametersEUTRA3-r16 OCTET STRING OPTIONAL,

supportedBandListSidelinkEUTRA-r16 SEQUENCE (SIZE (1..maxBandsEUTRA)) OF BandSidelinkEUTRA-r16 OPTIONAL,

...

}

RLC-ParametersSidelink-r16 ::= SEQUENCE {

am-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

um-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

...

}

MAC-ParametersSidelink-r16 ::= SEQUENCE {

mac-ParametersSidelinkCommon-r16 MAC-ParametersSidelinkCommon-r16 OPTIONAL,

mac-ParametersSidelinkXDD-Diff-r16 MAC-ParametersSidelinkXDD-Diff-r16 OPTIONAL,

...

}

UE-SidelinkCapabilityAddXDD-Mode-r16 ::= SEQUENCE {

mac-ParametersSidelinkXDD-Diff-r16 MAC-ParametersSidelinkXDD-Diff-r16 OPTIONAL

}

MAC-ParametersSidelinkCommon-r16 ::= SEQUENCE {

lcp-RestrictionSidelink-r16 ENUMERATED {supported} OPTIONAL,

multipleConfiguredGrantsSidelink-r16 ENUMERATED {supported} OPTIONAL,

...,

[[

drx-OnSidelink-r17 ENUMERATED {supported} OPTIONAL

]],

[[

sl-LBT-FailureDectectionRecovery-r18 ENUMERATED {supported} OPTIONAL

]]

}

MAC-ParametersSidelinkXDD-Diff-r16 ::= SEQUENCE {

multipleSR-ConfigurationsSidelink-r16 ENUMERATED {supported} OPTIONAL,

logicalChannelSR-DelayTimerSidelink-r16 ENUMERATED {supported} OPTIONAL,

...

}

BandSidelinkEUTRA-r16 ::= SEQUENCE {

freqBandSidelinkEUTRA-r16 FreqBandIndicatorEUTRA,

-- R1 15-7: Transmitting LTE sidelink mode 3 scheduled by NR Uu

gnb-ScheduledMode3SidelinkEUTRA-r16 SEQUENCE {

gnb-ScheduledMode3DelaySidelinkEUTRA-r16 ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot625, ms0dot75, ms1,

ms1dot25, ms1dot5, ms1dot75, ms2, ms2dot5, ms3, ms4,

ms5, ms6, ms8, ms10, ms20}

} OPTIONAL,

-- R1 15-9: Transmitting LTE sidelink mode 4 configured by NR Uu

gnb-ScheduledMode4SidelinkEUTRA-r16 ENUMERATED {supported} OPTIONAL

}

BandSidelink-r16 ::= SEQUENCE {

freqBandSidelink-r16 FreqBandIndicatorNR,

--15-1

sl-Reception-r16 SEQUENCE {

harq-RxProcessSidelink-r16 ENUMERATED {n16, n24, n32, n48, n64},

pscch-RxSidelink-r16 ENUMERATED {value1, value2},

scs-CP-PatternRxSidelink-r16 CHOICE {

fr1-r16 SEQUENCE {

scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

},

fr2-r16 SEQUENCE {

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

}

} OPTIONAL,

extendedCP-RxSidelink-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-2

sl-TransmissionMode1-r16 SEQUENCE {

harq-TxProcessModeOneSidelink-r16 ENUMERATED {n8, n16},

scs-CP-PatternTxSidelinkModeOne-r16 CHOICE {

fr1-r16 SEQUENCE {

scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

},

fr2-r16 SEQUENCE {

scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

}

},

extendedCP-TxSidelink-r16 ENUMERATED {supported} OPTIONAL,

harq-ReportOnPUCCH-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-4

sync-Sidelink-r16 SEQUENCE {

gNB-Sync-r16 ENUMERATED {supported} OPTIONAL,

gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r16 ENUMERATED {supported} OPTIONAL,

gNB-GNSS-UE-SyncWithPriorityOnGNSS-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-10

sl-Tx-256QAM-r16 ENUMERATED {supported} OPTIONAL,

--15-11

psfch-FormatZeroSidelink-r16 SEQUENCE {

psfch-RxNumber ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64},

psfch-TxNumber ENUMERATED {n4, n8, n16}

} OPTIONAL,

--15-12

lowSE-64QAM-MCS-TableSidelink-r16 ENUMERATED {supported} OPTIONAL,

--15-15

enb-sync-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

...,

[[

--15-3

sl-TransmissionMode2-r16 SEQUENCE {

harq-TxProcessModeTwoSidelink-r16 ENUMERATED {n8, n16},

scs-CP-PatternTxSidelinkModeTwo-r16 ENUMERATED {supported} OPTIONAL,

dl-openLoopPC-Sidelink-r16 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--15-5

congestionControlSidelink-r16 SEQUENCE {

cbr-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

cbr-CR-TimeLimitSidelink-r16 ENUMERATED {time1, time2}

} OPTIONAL,

--15-22

fewerSymbolSlotSidelink-r16 ENUMERATED {supported} OPTIONAL,

--15-23

sl-openLoopPC-RSRP-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

--13-1

sl-Rx-256QAM-r16 ENUMERATED {supported} OPTIONAL

]],

[[

ue-PowerClassSidelink-r16 ENUMERATED {pc2, pc3, pc5-v1820, spare5, spare4, spare3, spare2, spare1}

OPTIONAL

]],

[[

--32-4a

sl-TransmissionMode2-RandomResourceSelection-r17 SEQUENCE {

harq-TxProcessModeTwoSidelink-r17 ENUMERATED {n8, n16},

scs-CP-PatternTxSidelinkModeTwo-r17 CHOICE {

fr1-r17 SEQUENCE {

scs-15kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

scs-30kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

},

fr2-r17 SEQUENCE {

scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

scs-120kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

}

} OPTIONAL,

extendedCP-Mode2Random-r17 ENUMERATED {supported} OPTIONAL,

dl-openLoopPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--32-4b

sync-Sidelink-v1710 SEQUENCE {

sync-GNSS-r17 ENUMERATED {supported} OPTIONAL,

gNB-Sync-r17 ENUMERATED {supported} OPTIONAL,

gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r17 ENUMERATED {supported} OPTIONAL,

gNB-GNSS-UE-SyncWithPriorityOnGNSS-r17 ENUMERATED {supported} OPTIONAL

} OPTIONAL,

--32-4c

enb-sync-Sidelink-v1710 ENUMERATED {supported} OPTIONAL,

--32-5a-2

rx-IUC-Scheme1-PreferredMode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

--32-5a-3

rx-IUC-Scheme1-NonPreferredMode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

--32-5b-2

rx-IUC-Scheme2-Mode2Sidelink-r17 ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64} OPTIONAL,

--32-6-1

rx-IUC-Scheme1-SCI-r17 ENUMERATED {supported} OPTIONAL,

--32-6-2

rx-IUC-Scheme1-SCI-ExplicitReq-r17 ENUMERATED {supported} OPTIONAL

]],

[[

sharedSpectrumChAccessParamsSidelinkPerBand-r18 SharedSpectrumChAccessParamsSidelinkPerBand-r18 OPTIONAL,

--R1 41-1-1 Common SL-PRS processing capability in a SL BWP

sl-PRS-CommonProcCapabilityPerBand-r18 SEQUENCE {

maxSL-PRS-Bandwidth-r18 CHOICE {

fr1-r18 ENUMERATED {mhz5, mhz10, mhz20, mhz40, mhz50, mhz80, mhz100},

fr2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

},

maxNumOfActiveSL-PRS-ResourcesInOneSlot-r18 CHOICE {

fr1-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24},

fr2-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64, n128}

},

maxNumOfSlotsWithActiveSL-PRS-Resources-r18 CHOICE {

fr1-r18 ENUMERATED {n1, n2, n3, n4, n6, n8},

fr2-r18 ENUMERATED {n1, n2, n4, n8, n12, n16, n24, n32, n48, n64}

},

minTimeAfterEndofSlotCarryActiveSL-PRS-Resources-r18 ENUMERATED {ms20, ms30, ms40, ms50, ms80, ms100, ms160}

} OPTIONAL,

-- R1 41-1-2: Receiving SL-PRS in a shared resource pool

sl-PRS-RxInSharedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

-- R1 41-1-3: Receiving SL-PRS in a dedicated resource pool

sl-PRS-RxInDedicatedResourcePool-r18 SEQUENCE {

numOfSupportedRxPSCCH-PerSlot-r18 ENUMERATED {value1, value2},

supportedCP-TypeFor60kHzSCS-r18 ENUMERATED {ncp, ncpAndECP}

} OPTIONAL,

-- R1 41-1-4a: Transmitting SL-PRS in a shared resource pool

sl-PRS-TxInSharedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

-- R1 41-1-4b: Transmitting SL-PRS scheme 1 in a dedicated resource pool

sl-PRS-TxScheme1InDedicatedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

-- R1 41-1-4c: Transmitting SL-PRS mode 2 in a dedicated resource pool

sl-PRS-TxScheme2InDedicatedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

-- R1 41-1-5: SL-PRS congestion control in a dedicated resource pool

sl-PRS-CongestionCtrl-r18 ENUMERATED {cpt1, cpt2, cpt3} OPTIONAL,

-- R1 41-1-8: Support of random selection in a dedicated resource pool

sl-PRS-TxRandomSelection-r18 ENUMERATED {supported} OPTIONAL,

-- R1 41-1-10: Support of full sensing in a dedicated resource pool

sl-PRS-TxUsingFullSensing-r18 ENUMERATED {value1, value2} OPTIONAL,

-- R1 41-1-20: Supports SL PRS Rx for a band configured with SL CA

sl-PRS-RxForBandWithSL-CA-r18 ENUMERATED {supported} OPTIONAL,

-- R1 41-1-21: Supports SL PRS Tx for a band configured with SL CA

sl-PRS-TxForBandWithSL-CA-r18 ENUMERATED {supported} OPTIONAL,

-- R1 47-s1: Transmission/Reception using dynamic resource pool sharing

sl-DynamicSharingTxRx-r18 ENUMERATED {supported} OPTIONAL,

-- R1 47-v1: NR SL communication with SL CA

sl-CA-Communication-r18 SEQUENCE {

numberOfCarriers-r18 INTEGER (2..8),

numberOfPSCCH-DecodeValueZ-r18 INTEGER (1..2),

totalBandwidth-r18 ENUMERATED {mhz20,mhz30,mhz40,mhz50,mhz60,mhz70}

} OPTIONAL,

-- R1 47-v2: Synchronization for SL CA

sl-CA-Synchronization-r18 ENUMERATED {supported} OPTIONAL,

-- R1 47-v3: PSFCH for SL CA

sl-CA-PSFCH-r18 SEQUENCE {

rx-PSFCH-Resource-r18 ENUMERATED {n5,n15,n25,n32,n35,n45,n50,n64,n100},

tx-PSFCH-Resource-r18 ENUMERATED {n4,n8,n16,n24}

} OPTIONAL,

-- R4 45-2: SL reception in intra-carrier guard band

sl-ReceptionIntraCarrierGuardBand-r18 ENUMERATED {supported} OPTIONAL

]],

[[

-- R1 41-1-17: Open loop SL pathloss based power control for SL-PRS and associated PSCCH and SL RSRP report for dedicated

-- resource pool

sl-PathlossBasedOLPC-SL-RSRP-Report-r18 ENUMERATED {supported} OPTIONAL

]]

}

RelayParameters-r17 ::= SEQUENCE {

relayUE-Operation-L2-r17 ENUMERATED {supported} OPTIONAL,

remoteUE-Operation-L2-r17 ENUMERATED {supported} OPTIONAL,

remoteUE-PathSwitchToIdleInactiveRelay-r17 ENUMERATED {supported} OPTIONAL,

...,

[[

relayUE-U2U-OperationL2-r18 ENUMERATED {supported} OPTIONAL,

remoteUE-U2U-OperationL2-r18 ENUMERATED {supported} OPTIONAL,

remoteUE-U2N-PathSwitchOperationL2-r18 ENUMERATED {supported} OPTIONAL,

multipathRemoteUE-PC5L2-r18 ENUMERATED {supported} OPTIONAL,

multipathRelayUE-N3C-r18 ENUMERATED {supported} OPTIONAL,

multipathRemoteUE-N3C-r18 ENUMERATED {supported} OPTIONAL,

remoteUE-IndirectPathAddChangeToIdleInactiveRelay-r18 ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationMoreThanOneUuRLC-r18 ENUMERATED {supported} OPTIONAL,

pdcp-CADuplicationDirectpath-DRB-r18 ENUMERATED {supported} OPTIONAL,

pdcp-CADuplicationDirectpath-SRB-r18 ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationMP-SplitDRB-r18 ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationMP-SplitSRB-r18 ENUMERATED {supported} OPTIONAL,

directpathRLF-RecoveryViaSRB1-r18 ENUMERATED {supported} OPTIONAL,

splitDRB-WithUL-BothDirectIndirect-r18 ENUMERATED {supported} OPTIONAL

]]

}

PDCP-ParametersSidelink-r18 ::= SEQUENCE {

pdcp-DuplicationSRB-sidelink-r18 ENUMERATED {supported} OPTIONAL,

pdcp-DuplicationDRB-sidelink-r18 ENUMERATED {supported} OPTIONAL,

...

}

-- TAG-SIDELINKPARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *SidelinkParametersEUTRA* field descriptions |
| ***sl-ParametersEUTRA1, sl-ParametersEUTRA2, sl-ParametersEUTRA3***  This field includes IE of *SL-Parameters-v1430* (where *v2x-eNB-Scheduled-r14* and *V2X-SupportedBandCombination-r14* shall not be included), *SL-Parameters-v1530* (where *V2X-SupportedBandCombination-r1530* shall not be included) and *SL-Parameters-v1540* respectively defined in 36.331 [10]. It is used for reporting the per-UE capability for V2X sidelink communication. |

=================================NEXT CHANGE=======================================

### 6.3.5 Sidelink information elements

=================================NEXT CHANGE=======================================

#### – *SL-ConfigDedicatedNR*

The IE *SL-ConfigDedicatedNR* specifies the dedicated configuration information for NR sidelink communication/discovery/positioning.

*SL-ConfigDedicatedNR* information element

-- ASN1START

-- TAG-SL-CONFIGDEDICATEDNR-START

SL-ConfigDedicatedNR-r16 ::= SEQUENCE {

sl-PHY-MAC-RLC-Config-r16 SL-PHY-MAC-RLC-Config-r16 OPTIONAL, -- Need M

sl-RadioBearerToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SLRB-Uu-ConfigIndex-r16 OPTIONAL, -- Need N

sl-RadioBearerToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SL-RadioBearerConfig-r16 OPTIONAL, -- Need N

sl-MeasConfigInfoToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-DestinationIndex-r16 OPTIONAL, -- Need N

sl-MeasConfigInfoToAddModList-r16 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-MeasConfigInfo-r16 OPTIONAL, -- Need N

t400-r16 ENUMERATED {ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL, -- Need M

...,

[[

sl-PHY-MAC-RLC-Config-v1700 SetupRelease { SL-PHY-MAC-RLC-Config-v1700 } OPTIONAL, -- Need M

sl-DiscConfig-r17 SetupRelease { SL-DiscConfig-r17} OPTIONAL -- Need M

]],

[[

sl-DiscConfig-v1800 SL-DiscConfig-v1800 OPTIONAL -- Need M

]],

[[

sl-DiscConfig-v1830 SL-DiscConfig-v1830 OPTIONAL -- Need M

]],

[[

sl-DiscConfig-v1840 SL-DiscConfig-v1840 OPTIONAL -- Need M

]],

[[

sl-DiscConfig-v19xy SL-DiscConfig-v19xy OPTIONAL -- Need M

]]

}

SL-ConfigDedicatedNR-v16k0 ::= SEQUENCE {

sl-PHY-MAC-RLC-Config-v16k0 SL-PHY-MAC-RLC-Config-v16k0 OPTIONAL -- Need M

}

SL-DestinationIndex-r16 ::= INTEGER (0..maxNrofSL-Dest-1-r16)

SL-PHY-MAC-RLC-Config-r16::= SEQUENCE {

sl-ScheduledConfig-r16 SetupRelease { SL-ScheduledConfig-r16 } OPTIONAL, -- Need M

sl-UE-SelectedConfig-r16 SetupRelease { SL-UE-SelectedConfig-r16 } OPTIONAL, -- Need M

sl-FreqInfoToReleaseList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-Freq-Id-r16 OPTIONAL, -- Need N

sl-FreqInfoToAddModList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfig-r16 OPTIONAL, -- Need N

sl-RLC-BearerToReleaseList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfigIndex-r16 OPTIONAL, -- Need N

sl-RLC-BearerToAddModList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL, -- Need N

sl-MaxNumConsecutiveDTX-r16 ENUMERATED {n1, n2, n3, n4, n6, n8, n16, n32} OPTIONAL, -- Need M

sl-CSI-Acquisition-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

sl-CSI-SchedulingRequestId-r16 SetupRelease {SchedulingRequestId} OPTIONAL, -- Need M

sl-SSB-PriorityNR-r16 INTEGER (1..8) OPTIONAL, -- Need R

networkControlledSyncTx-r16 ENUMERATED {on, off} OPTIONAL -- Need M

}

SL-PHY-MAC-RLC-Config-v16k0 ::= SEQUENCE {

sl-FreqInfoToAddModListExt-v16k0 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigExt-v16k0 OPTIONAL -- Need N

}

SL-PHY-MAC-RLC-Config-v1700 ::= SEQUENCE {

sl-DRX-Config-r17 SL-DRX-Config-r17 OPTIONAL, -- Need M

sl-RLC-ChannelToReleaseList-r17 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-ChannelID-r17 OPTIONAL, -- Cond L2U2N

sl-RLC-ChannelToAddModList-r17 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-ChannelConfig-r17 OPTIONAL, -- Cond L2U2N

...,

[[

sl-RLC-BearerToAddModListSizeExt-v1800 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL, -- Need N

sl-RLC-BearerToReleaseListSizeExt-v1800 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfigIndex-v1800 OPTIONAL, -- Need N

sl-FreqInfoToAddModListExt-v1800 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigExt-v1800 OPTIONAL, -- Need N

sl-LBT-SchedulingRequestId-r18 SetupRelease {SchedulingRequestId} OPTIONAL, -- Need M

sl-SyncFreqList-r18 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-Freq-Id-r16 OPTIONAL, -- Need M

sl-SyncTxMultiFreq-r18 ENUMERATED {true} OPTIONAL, -- Need R

sl-MaxTransPowerCA-r18 P-Max OPTIONAL, -- Need R

sl-SCCH-CarrierSetConfig-r18 SetupRelease {SL-SCCH-CarrierSetConfigList-r18} OPTIONAL, -- Need M

sl-PRS-SchedulingRequestId-r18 SetupRelease {SchedulingRequestId} OPTIONAL -- Need M

]]

}

SL-DiscConfig-r17::= SEQUENCE {

sl-RelayUE-Config-r17 SetupRelease { SL-RelayUE-Config-r17} OPTIONAL, -- Cond L2RelayUE

sl-RemoteUE-Config-r17 SetupRelease { SL-RemoteUE-Config-r17} OPTIONAL -- Cond L2RemoteUE

}

SL-DiscConfig-v1800 ::= SEQUENCE {

sl-RelayUE-ConfigU2U-r18 SetupRelease { SL-RelayUE-ConfigU2U-r18} OPTIONAL, -- Cond U2URelayUE

sl-RemoteUE-ConfigU2U-r18 SetupRelease { SL-RemoteUE-ConfigU2U-r18} OPTIONAL -- Cond U2URemoteUE

}

SL-SCCH-CarrierSetConfigList-r18 ::= SEQUENCE (SIZE (1..maxNrofSL-CarrierSetConfig-r18)) OF SL-SCCH-CarrierSetConfig-r18

SL-SCCH-CarrierSetConfig-r18 ::= SEQUENCE {

sl-DestinationList-r18 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-DestinationIdentity-r16,

sl-SRB-Identity-r18 SEQUENCE (SIZE (1..3)) OF SRB-Identity,

sl-AllowedCarrierFreqSet1-r18 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF INTEGER (1..maxNrofFreqSL-r16),

sl-AllowedCarrierFreqSet2-r18 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF INTEGER (1..maxNrofFreqSL-r16)

}

SL-DiscConfig-v1830 ::= SEQUENCE {

sl-RemoteUE-ConfigU2U-v1830 SetupRelease { SL-RemoteUE-ConfigU2U-v1830} OPTIONAL -- Cond U2URemoteUE

}

SL-DiscConfig-v1840 ::= SEQUENCE {

sl-RelayUE-ConfigU2U-v1840 SetupRelease { SL-RelayUE-ConfigU2U-v1840} OPTIONAL -- Cond U2URelayUE

}

SL-DiscConfig-v19xy ::= SEQUENCE {

sl-RelayUE-ConfigMH-r19 SetupRelease { SL-RelayUE-ConfigMH-r19} OPTIONAL -- Cond L2RelayUE

}

-- TAG-SL-CONFIGDEDICATEDNR-STOP

-- ASN1STOP

| *SL-ConfigDedicatedNR* field descriptions |
| --- |
| ***sl-LBT-SchedulingRequestId***  Indicates the scheduling request configuration applicable for Sidelink consistent LBT failure report, as specified in TS 38.321 [3]. |
| ***sl-MaxTransPowerCA***  The maximum total transmit power to be used by the UE across all sidelink carriers. |
| ***sl-MeasConfigInfoToAddModList***  This field indicates the RSRP measurement configurations for unicast destinations to add and/or modify. |
| ***sl-MeasConfigInfoToReleaseList***  This field indicates the RSRP measurement configurations for unicast destinations to remove. |
| ***sl-PHY-MAC-RLC-Config***  This field indicates the lower layer sidelink radio bearer configurations. |
| ***sl-RadioBearerToAddModList***  This field indicates one or multiple sidelink radio bearer configurations to add and/or modify. This field is not configured to the PC5 connection used for L2 U2N relay operation. |
| ***sl-RadioBearerToReleaseList***  This field indicates one or multiple sidelink radio bearer configurations to remove. This field is not configured to the PC5 connection used for L2 U2N relay operation. |

| *SL-PHY-MAC-RLC-Config* field descriptions |
| --- |
| ***networkControlledSyncTx***  This field indicates whether the UE shall transmit synchronisation information (i.e. become synchronisation source). Value *on* indicates the UE to transmit synchronisation information while value *off* indicates the UE to not transmit such information. |
| ***sl-DRX-Config***  This field indicates the sidelink DRX configuration(s) for unicast, groupcast and/or broadcast communication, as specified in TS 38.321 [3]. |
| ***sl-MaxNumConsecutiveDTX***  This field indicates the maximum number of consecutive HARQ DTX before triggering sidelink RLF. Value n1 corresponds to 1, value n2 corresponds to 2, and so on. |
| ***sl-FreqInfoToAddModList, sl-FreqInfoToAddModListExt-v16k0, sl-FreqInfoToAddModListExt-v1800***  This field indicates the NR sidelink communication configuration on some carrier frequency (ies) to add and/or modify. If the network includes *sl-FreqInfoToAddModListExt-v16k0*, it includes the same number of entries, and listed in the same order, as in *sl-FreqInfoToAddModList-r16*. If the network includes *sl-FreqInfoToAddModListExt-v1800*, it includes the same number of entries, and listed in the same order, as in *sl-FreqInfoToAddModList-r16*. |
| ***sl-FreqInfoToReleaseList***  This field indicates the NR sidelink communication configuration on some carrier frequency (ies) to remove. In this release, only one entry can be configured in the list. |
| ***sl-RLC-BearerToAddModList, sl-RLC-BearerToAddModListSizeExt***  This field indicates one or multiple sidelink RLC bearer configurations to add and/or modify. |
| ***sl-RLC-BearerToReleaseList, sl-RLC-BearerToReleaseListSizeExt***  This field indicates one or multiple sidelink RLC bearer configurations to remove. |
| ***sl-RLC-ChannelToAddModList***  This field indicates one or multiple PC5 Relay RLC Channel configurations to add and/or modify. Each PC5 Relay RLC channel configuration provided by network to L2 U2N Relay UE is uniquely associated with one L2 U2N Remote UE. |
| ***sl-RLC-ChannelToReleaseList***  This field indicates one or multiple PC5 Relay RLC Channel configurations to remove. |
| ***sl-ScheduledConfig***  Indicates the configuration for UE to transmit NR sidelink communication based on network scheduling. This field is not configured simultaneously with sl-UE-SelectedConfig. This field is not configured to a L2 U2N Remote UE. |
| ***sl-UE-SelectedConfig***  Indicates the configuration used for UE autonomous resource selection. This field is not configured simultaneously with *sl-ScheduledConfig*. |
| ***sl-CSI-Acquisition***  Indicates whether CSI reporting is enabled in sidelink unicast. If the field is absent, sidelink CSI reporting is disabled. |
| ***sl-CSI-SchedulingRequestId***  If present, it indicates the scheduling request configuration applicable for Sidelink CSI Reporting MAC CE and Sidelink DRX Command MAC CE, as specified in TS 38.321 [3]. |
| ***sl-PRS-SchedulingRequestId***  If present, it indicates the scheduling request configuration applicable for Sidelink PRS Request MAC CE, as specified in TS 38.321 [3]. |
| ***sl-SSB-PriorityNR***  This field indicates the priority of NR sidelink SSB transmission and reception. |
| ***sl-SyncFreqList***  Indicates a list of candidate carrier frequencies that can be used for the synchronisation of NR sidelink communication. |
| ***sl-SyncTxMultiFreq***  Indicates that the UE transmits S-SSB on multiple carrier frequencies for NR sidelink communication. If this field is absent, the UE transmits S-SSB only on the synchronisation carrier frequency. |

| *SL-SCCH-CarrierSetConfig* field descriptions |
| --- |
| ***sl-AllowedCarrierFreqSet1, sl-AllowedCarrierFreqSet2***  Indicates the set of carrier frequencies applicable for the transmission of the MAC SDUs from the sidelink SRB logical channels whose associated destination is included in sl-destinationList. If present, network ensures *sl-AllowedCarrierFreqSet1* and *sl-AllowedCarrierFreqSet2* do not include the same carrier frequency. The value 1 corresponds to the frequency of first entry in *sl-FreqInfoList* broadcast in *SIB12*, the value 2 corresponds to the frequency of first entry in *sl-FreqInfoListSizeExt* broadcast in *SIB12*, the value 3 corresponds to the frequency of second entry in *sl-FreqInfoListSizeExt* broadcast in *SIB12* and so on. |
| ***sl-DestinationList***  This field indicates the list of destination identify that the *sl-AllowedCarrierFreqSet1* and *sl-AllowedCarrierFreqSet2* apply. Only destination identity for unicast link can be included in this field. |
| ***sl-SRB-Identity***  This field indicates the list of sidelink SRB identities that the *sl-AllowedCarrierFreqSet1* and *sl-AllowedCarrierFreqSet2* apply. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RelayUE* | For L2 U2N Relay UE, the field is optionally present, Need M. Otherwise, it is absent. |
| *L2RemoteUE* | For L2 U2N Remote UE, the field is optionally present, Need M. Otherwise, it is absent. |
| *L2U2N* | The field is optional present for L2 U2N or L2 U2U Relay UE and L2 U2N or L2 U2U Remote UE, need N. Otherwise, it is absent. |
| *U2URelayUE* | For U2U Relay UE, the field is optionally present, Need M. Otherwise, it is absent. |
| *U2URemoteUE* | For U2U Remote UE, the field is optionally present, Need M. Otherwise, it is absent. |

=================================NEXT CHANGE=======================================

#### – *SL-L2RelayUE-Config*

The IE *SL*-*L2RelayUE-Config* is used to configure L2 U2N relay operation related configurations used by L2 U2N Relay UE, or L2 U2U relay operation related configurations used by L2 U2U Relay UE.

*SL-L2RelayUE-Config* information element

-- ASN1START

-- TAG-SL-L2RELAYUE-CONFIG-START

SL-L2RelayUE-Config-r17 ::= SEQUENCE {

sl-RemoteUE-ToAddModList-r17 SEQUENCE (SIZE (1..maxNrofRemoteUE-r17)) OF SL-RemoteUE-ToAddMod-r17 OPTIONAL, -- Need N

sl-RemoteUE-ToReleaseList-r17 SEQUENCE (SIZE (1..maxNrofRemoteUE-r17)) OF SL-DestinationIdentity-r16 OPTIONAL, -- Need N

...,

[[

sl-U2U-RemoteUE-ToAddModList-r18 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-U2U-RemoteUE-Config-r18 OPTIONAL, -- Need N

sl-U2U-RemoteUE-ToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-DestinationIdentity-r16 OPTIONAL -- Need N

]]

}

SL-RemoteUE-ToAddMod-r17 ::= SEQUENCE {

sl-L2IdentityRemote-r17 SL-DestinationIdentity-r16,

sl-SRAP-ConfigRelay-r17 SL-SRAP-Config-r17 OPTIONAL, -- Need M

...,

[[

sl-SRAP-ConfigRelay-ToAddModList-r19 SEQUENCE (SIZE (1..maxNrofRemoteUE-r17)) OF SL-SRAP-Config-ToAddMod-r19 OPTIONAL, -- Need R

sl-SRAP-ConfigRelay-ToReleaseList-r19 SEQUENCE (SIZE (1..maxNrofRemoteUE-r17)) OF SL-SRAP-ConfigId-r19 OPTIONAL -- Need R

]]

}

SL-U2U-RemoteUE-Config-r18 ::= SEQUENCE {

sl-L2IdentityRemoteUE-r18 SL-DestinationIdentity-r16,

sl-SourceRemoteUE-ToAddModList-r18 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-SourceRemoteUE-Config-r18 OPTIONAL, -- Need N

sl-SourceRemoteUE-ToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofSL-Dest-r16)) OF SL-SourceIdentity-r17 OPTIONAL, -- Need N

...

}

SL-SourceRemoteUE-Config-r18 ::= SEQUENCE {

sl-SourceUE-Identity-r18 SL-SourceIdentity-r17,

sl-SRAP-ConfigU2U-r18 SL-SRAP-ConfigU2U-r18,

...

}

SL-SRAP-Config-ToAddMod-r19 ::= SEQUENCE {

sl-SRAP-ConfigId-r19 SL-SRAP-ConfigId-r19,

sl-SRAP-ConfigRelay-r17 SL-SRAP-Config-r17

...

}

-- TAG-SL-L2RELAYUE-CONFIG-STOP

-- ASN1STOP

| *SL-L2RelayUE-Config* field descriptions |
| --- |
| ***sl-RemoteUE-ToAddModList***  List of L2 U2N Remote UEs to be added and modified to the L2 U2N Relay UE. |
| ***sl-RemoteUE-ToReleaseList***  List of L2 U2N Remote UEs to be released by the L2 U2N Relay UE. |
| ***sl-U2U-RemoteUE-ToAddModList***  List of target L2 U2U Remote UEs for which the related configuration is to be added and modified to the L2 U2U Relay UE. |
| ***sl-U2U-RemoteUE-ToReleaseList***  List of target L2 U2U Remote UEs for which the related configuration is to be released by the L2 U2U Relay UE. |
| ***sl-U2U-SourceRemoteUE-ToAddModList***  List of Source L2 U2U Remote UEs for which the related configuration is to be added and modified relative to the destination L2 U2U Remote UE identified by the *sl-L2IdentityRemoteUE*. |
| ***sl-U2U-SourceRemoteUE-ToReleaseList***  List of Source L2 U2U Remote UEs for which the related configuration is to be released relative to the destination L2 U2U Remote UE identified by the *sl-L2IdentityRemoteUE*. |
| ***sl-SRAP-ConfigRelay-ToAddModList***  List of SRAP configuration for each indirectly connected child UE in the multi hop case |
| ***sl-SRAP-ConfigRelay-ToReleaseList***  List of SRAP configuration be released for each indirectly connected child UE in the multi hop case |

=================================NEXT CHANGE=======================================

– *SL-RelayUE-Config*

The IE *SL-RelayUE-Config* specifies the configuration information for NR sidelink U2N Relay UE.

*SL-RelayUE-Config* information element

-- ASN1START

-- TAG-SL-RELAYUE-CONFIG-START

SL-RelayUE-Config-r17::= SEQUENCE {

threshHighRelay-r17 RSRP-Range OPTIONAL, -- Need R

threshLowRelay-r17 RSRP-Range OPTIONAL, -- Need R

hystMaxRelay-r17 Hysteresis OPTIONAL, -- Cond ThreshHighRelay

hystMinRelay-r17 Hysteresis OPTIONAL -- Cond ThreshLowRelay

}

-- TAG-SL-RELAYUE-CONFIG-STOP

-- ASN1STOP

| *SL-RelayUE-Config* field descriptions |
| --- |
| ***threshHighRelay***  Indicates the upper threshold of Uu RSRP for a UE that is in network coverage to evaluate AS layer conditions for U2N relay UE or Last U2N Relay UE operation. |
| ***threshLowRelay***  Indicates the lower threshold of Uu RSRP for a UE that is in network coverage to evaluate AS layer conditions for U2N relay UE or Last U2N Relay UE operation. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *ThreshHighRelay* | This field is mandatory present if threshHighRelay is included. Otherwise, the field is absent, Need R. |
| *ThreshLowRelay* | This field is mandatory present if threshLowRelay is included. Otherwise, the field is absent, Need R. |

#### – *SL-RelayUE-ConfigMH*

The IE *SL-RelayUE-ConfigMH* specifies the threshold configuration information for NR sidelink Last U2N Relay UE or Intermediate U2N Relay UE or First U2N Relay UE. [RIL]: J012, SLRelay

*SL-RelayUE-ConfigMH* information element

-- ASN1START

-- TAG-SL-RELAYUE-CONFIGMH-START

SL-RelayUE-ConfigMH-r19::= SEQUENCE {

sd-RSRP-ThreshDiscConfigMH-r19 SL-RSRP-Range-r16,

sd-hystMaxRelayMH-r19 Hysteresis

}

-- TAG-SL-RELAYUE-CONFIGMH-STOP

-- ASN1STOP

| *SL-RelayUE-ConfigMH* field descriptions |
| --- |
| ***sd-RSRP-ThreshDiscConfigMH***  Indicates the threshold of SD-RSRP for an Last U2N Relay UE or Intermediate U2N Relay UE to evaluate AS layer conditions for discovery. The Last U2N relay UE applies the value of this field to evaluate AS layer conditions to decide whether to respond to the discovery solicitation message when performing the multi hop U2N Relay Discovery with Model B as specified in TS 23.304 [65]. The Intermediate U2N relay UE or the First U2N relay UE applies the value of this field to evaluate AS layer conditions to decide whether to forward the discovery solicitation message when performing the multi hop U2N Relay Discovery with Model B as specified in TS 23.304 [65]. |

=================================NEXT CHANGE=======================================

#### – *SL-RLC-ChannelConfig*

The IE *SL-RLC-ChannelConfig* specifies the configuration information for PC5 Relay RLC channel between L2 U2N Relay UE and L2 U2N Remote UE, or between L2 U2U Remote UE and L2 U2U Relay UE or between L2 U2N Relay UEs (in case of multi-hop L2 U2N relay communication).

*SL-RLC-ChannelConfig* information element

-- ASN1START

-- TAG-SL-RLC-RLC-CHANNEL-CONFIG-START

SL-RLC-ChannelConfig-r17 ::= SEQUENCE {

sl-RLC-ChannelID-r17 SL-RLC-ChannelID-r17,

sl-RLC-Config-r17 SL-RLC-Config-r16 OPTIONAL, -- Need M

sl-MAC-LogicalChannelConfig-r17 SL-LogicalChannelConfig-r16 OPTIONAL, -- Need M

sl-PacketDelayBudget-r17 INTEGER (0..1023) OPTIONAL, -- Need M

...}

-- TAG-SL-RLC-CHANNEL-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *SL-RLC-ChannelConfig* field descriptions |
| ***sl-MAC-LogicalChannelConfig***  The field is used to configure MAC SL logical channel parameters. |
| ***sl-RLC-ChannelID***  Indicates the PC5 Relay RLC channel in the link between L2 U2N Relay UE and L2 U2N Remote UE, or between L2 U2U Remote UE and L2 U2U Relay UE or between L2 U2N Relay UEs (in case of multi-hop L2 U2N relay communication). |
| ***sl-RLC-Config***  Determines the RLC mode (UM, AM) and provides corresponding parameters. |
| ***sl-PacketDelayBudget***  Indicates the Packet Delay Budget for a PC5 Relay RLC channel used in L2 U2N relay operation. Upper bound value for the delay that a packet may experience expressed in unit of 0.5ms. |

=================================NEXT CHANGE=======================================

#### – *SL-SRAP-Config*

The IE *SL-SRAP-Config* is used to set the configurable SRAP parameters used by L2 U2N Relay UE and L2 U2N Remote UE as specified in TS 38.351 [66].

***SL-SRAP-Config* information element**

-- ASN1START

-- TAG-SL-SRAP-CONFIG-START

SL-SRAP-Config-r17 ::= SEQUENCE {

sl-LocalIdentity-r17 INTEGER (0..255) OPTIONAL, -- Need M

sl-MappingToAddModList-r17 SEQUENCE (SIZE (1..maxLC-ID)) OF SL-MappingToAddMod-r17 OPTIONAL, -- Need N

sl-MappingToReleaseList-r17 SEQUENCE (SIZE (1..maxLC-ID)) OF SL-RemoteUE-RB-Identity-r17 OPTIONAL, -- Need N

...

}

SL-MappingToAddMod-r17 ::= SEQUENCE {

sl-RemoteUE-RB-Identity-r17 SL-RemoteUE-RB-Identity-r17,

sl-EgressRLC-ChannelUu-r17 Uu-RelayRLC-ChannelID-r17 OPTIONAL, -- Cond L2RelayUE

sl-EgressRLC-ChannelPC5-r17 SL-RLC-ChannelID-r17 OPTIONAL, -- Need N

...,

[[

sl-EgressRLC-Channel-UL-r19 SL-RLC-ChannelID-r17 OPTIONAL, -- Need N

sl-EgressRLC-Channel-DL-r19 SL-RLC-ChannelID-r17 OPTIONAL -- Need N

]]

}

SL-RemoteUE-RB-Identity-r17 ::= CHOICE {

srb-Identity-r17 INTEGER (0..3),

drb-Identity-r17 DRB-Identity,

...

}

-- TAG-SL-SRAP-CONFIG-STOP

-- ASN1STOP

|  |
| --- |
| *SL-SRAP-Config* field descriptions |
| ***sl-LocalIdentity***  Indicates the local UE ID of the L2 U2N Remote UE (in case of single hop) or local UE ID of the directly or indirectly connected remote UE (in case of multi hop) used in SRAP as specified in TS 38.351 [66]. |
| ***sl-MappingToAddModList***  Indicates the list of mappings between the bearer identity of the L2 U2N Remote UE and the egress RLC channel as specified in TS 38.351 [66] to be added or modified. |
| ***sl-MappingToReleaseList***  Indicates the list of mappings between the bearer identity of the L2 U2N Remote UE and the egress RLC channel as specified in TS 38.351 [66] to be released. |
| ***sl-RemoteUE-RB-Identity***  Identity of the end-to-end Uu bearer identity of the L2 U2N Remote UE. The value 3 for the field *srb-identity-r17* (i.e., for configuring SRB3) is not supported in this version of the specification. |
| ***sl-EgressRLC-ChannelUu***  Indicates the egress RLC channel on Uu Hop for uplink transmissions at the L2 U2N Relay UE or L2 Last U2N Relay UE . |
| ***sl-EgressRLC-Channel-UL***  Indicates the egress RLC channel on PC5 Hop for uplink transmissions at the L2 Intermediate U2N Relay UE. |
| ***sl-EgressRLC-ChannelPC5***  Indicates the egress RLC channel on PC5 Hop for downlink transmissions at the L2 U2N Relay UE or L2 Last U2N Relay UE and for uplink transmissions at the L2 U2N Remote UE. |
| ***sl-EgressRLC-Channel-DL***  Indicates the egress RLC channel on PC5 Hop for downlink transmissions at the L2 Intermediate U2N Relay UE. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *L2RelayUE* | For L2 U2N Relay UE for single hop or for L2 Last U2N Relay UE for multi hop, the field is optionally present, Need M. Otherwise, it is absent. |

#### – *SL-SRAP-ConfigId*

The IE *SL-SRAP-ConfigId* is used to identify a SRAP configuration for a indirectly connected L2 U2N Remote UE at the L2 U2N Relay UE.

*SL-SRAP-ConfigId* information element

-- ASN1START

-- TAG-SL-SRAP-CONFIGID-START

SL-SRAP-ConfigId-r19 ::= INTEGER (1.. maxNrofRemoteUE-r17)

-- TAG-SL-SRAP-CONFIGID -STOP

-- ASN1STOP

=================================NEXT CHANGE=======================================

#### – *SL-SRAP-ConfigU2U*

The IE *SL*-*SRAP-ConfigU2U* is used to set the configurable SRAP parameters used by L2 U2U Relay UE and L2 U2U Remote UE as specified in TS 38.351 [66].

*SL-SRAP-ConfigU2U* information element

-- ASN1START

-- TAG-SL-SRAP-CONFIGU2U-START

SL-SRAP-ConfigU2U-r18 ::= SEQUENCE {

sl-MappingToAddMod-U2U-List-r18 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-MappingConfig-U2U-r18 OPTIONAL, -- Need N

sl-MappingToRelease-U2U-List-r18 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SLRB-Uu-ConfigIndex-r16 OPTIONAL -- Need N

}

SL-MappingConfig-U2U-r18 ::= SEQUENCE {

sl-RemoteUE-SLRB-Identity-r18 SLRB-Uu-ConfigIndex-r16,

sl-EgressRLC-ChannelPC5-r18 SL-RLC-ChannelID-r17,

...

}

-- TAG-SL-SRAP-CONFIGU2U-STOP

-- ASN1STOP

|  |
| --- |
| *SL-SRAP-ConfigU2U* field descriptions |
| ***sl-MappingToAddMod-U2U-List***  Indicates the list of mappings between the end-to-end sidelink DRB of a given L2 U2U Remote UE and the egress PC5 Relay RLC channel used by L2 U2U Remote UE and L2 U2U Relay UE when acting as Tx UE, as specified in TS 38.351 [66] to be added or modified. |
| ***sl-MappingToRelease-U2U-List***  Indicates the list of mappings between the end-to-end sidelink DRB of a given L2 U2U Remote UE and the egress PC5 Relay RLC channel as specified in TS 38.351 [66] to be released. |
| ***sl-EgressRLC-ChannelPC5***  Indicates the egress PC5 Relay RLC channel for sidelink transmissions at the L2 U2U Relay UE and at the L2 U2U Remote UE. |
| ***sl-RemoteUE-SLRB-Identity***  Identity of the end-to-end sidelink DRB of the L2 U2U Remote UE. |

## 6.6 PC5 RRC messages

=================================NEXT CHANGE=======================================

6.6.2 Message definitions

#### – *NotificationMessageSidelink*

The *NotificationMessageSidelink* message is used to send notification message from U2N Relay UE to the connected U2N Remote UE or from U2U Relay UE to the connected U2U Remote UE.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: U2N Relay UE to U2N Remote UE or U2N Parent UE to U2N Child UE or U2U Relay UE to U2U Remote UE

*NotificationMessageSidelink* message

-- ASN1START

-- TAG-NOTIFICATIONMESSAGESIDELINK-START

NotificationMessageSidelink-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

notificationMessageSidelink-r17 NotificationMessageSidelink-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

NotificationMessageSidelink-r17-IEs ::= SEQUENCE {

indicationType-r17 ENUMERATED {

relayUE-Uu-RLF, relayUE-HO, relayUE-CellReselection,

relayUE-Uu-RRC-Failure

} OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension NotificationMessageSidelink-v1800-IEs OPTIONAL

}

NotificationMessageSidelink-v1800-IEs ::= SEQUENCE {

sl-IndicationType-r18 ENUMERATED {relayUE-PC5-RLF, spare1} OPTIONAL, -- Need N

sl-DestinationIdentityRemoteUE-r18 SL-DestinationIdentity-r16 OPTIONAL, -- Need N

nonCriticalExtension NotificationMessageSidelink-v19xy-IEs OPTIONAL

}

NotificationMessageSidelink-v19xy-IEs ::= SEQUENCE {

mh-indicationType-r19[RIL]: X505, SLRelay ENUMERATED {[RIL]: B100, SLRelay, [RIL]: B101, SLRelay

relayUE-RelayReselection,

relayUE-CellSelection

} OPTIONAL, -- Need N

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-NOTIFICATIONMESSAGESIDELINK -STOP

-- ASN1STOP

#### – *RemoteUEInformationSidelink*

The *RemoteUEInformationSidelink* message is used to request SIB(s) or provide paging related information, or provide other remote UE information, as specified in clause 5.8.9.8.1.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: L2 U2N Remote UE to L2 U2N Relay UE, or U2N Child UE to U2N Parent UE, or L2 U2U Remote UE to L2 U2U Relay UE

*RemoteUEInformationSidelink* message

-- ASN1START

-- TAG-REMOTEUEINFORMATIONSIDELINK-START

RemoteUEInformationSidelink-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

remoteUEInformationSidelink-r17 RemoteUEInformationSidelink-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

RemoteUEInformationSidelink-r17-IEs ::= SEQUENCE {

sl-RequestedSIB-List-r17 SetupRelease { SL-RequestedSIB-List-r17} OPTIONAL, -- Need M

sl-PagingInfo-RemoteUE-r17 SetupRelease { SL-PagingInfo-RemoteUE-r17} OPTIONAL, -- Need M

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension RemoteUEInformationSidelink-v1800-IEs OPTIONAL

}

RemoteUEInformationSidelink-v1800-IEs ::= SEQUENCE {

sl-RequestedPosSIB-List-r18 SetupRelease { SL-RequestedPosSIB-List-r18 } OPTIONAL, -- Need M

sl-SFN-DFN-OffsetRequested-r18 ENUMERATED { true } OPTIONAL, -- Need R

connectionForMP-r18 ENUMERATED {true} OPTIONAL, -- Need N

sl-DestinationIdentityRemoteUE-r18 SL-DestinationIdentity-r16 OPTIONAL, -- Need N

nonCriticalExtension RemoteUEInformationSidelink-v1900-IEs OPTIONAL

}

RemoteUEInformationSidelink-v1900-IEs ::= SEQUENCE {

sl-PagingInfo-RemoteUE-List-r19 SetupRelease { SL-PagingInfo-RemoteUE-List-r19} OPTIONAL, -- Need M

nonCriticalExtension SEQUENCE {} OPTIONAL

}

SL-PagingInfo-RemoteUE-List-r19 ::= SEQUENCE (SIZE (1..maxNrofRemoteUE-r17)) OF SL-PagingInfo-RemoteUE-r17

SL-RequestedSIB-List-r17 ::= SEQUENCE (SIZE (maxSIB-MessagePlus1-r17)) OF SL-SIB-ReqInfo-r17

SL-PagingInfo-RemoteUE-r17 ::= SEQUENCE {

sl-PagingIdentityRemoteUE-r17 SL-PagingIdentityRemoteUE-r17,

sl-PagingCycleRemoteUE-r17 PagingCycle OPTIONAL -- Need M

}

SL-SIB-ReqInfo-r17 ::= ENUMERATED { sib1, sib2, sib3, sib4, sib5, sib6, sib7, sib8, sib9, sib10, sib11, sib12, sib13,

sib14, sib15, sib16, sib17, sib18, sib19, sib20, sib21, sibNotReq11, sibNotReq10,

sibNotReq9, sibNotReq8, sibNotReq7, sibNotReq6, sibNotReq5, sibNotReq4,

sibNotReq3, sibNotReq2, sibNotReq1, ..., sib17bis-v1820 }

SL-RequestedPosSIB-List-r18 ::= SEQUENCE (SIZE (1..maxSIB)) OF SL-PosSIB-ReqInfo-r18

SL-PosSIB-ReqInfo-r18 ::= SEQUENCE {

gnss-id-r18 GNSS-ID-r16 OPTIONAL, -- Need R

sbas-id-r18 SBAS-ID-r16 OPTIONAL, -- Cond GNSS-ID-SBAS

posSibType-r18 ENUMERATED { posSibType1-1, posSibType1-2, posSibType1-3, posSibType1-4, posSibType1-5, posSibType1-6,

posSibType1-7, posSibType1-8, posSibType1-9, posSibType1-10, posSibType1-11,

posSibType1-12, posSibType2-1, posSibType2-2, posSibType2-3, posSibType2-4, posSibType2-5,

posSibType2-6, posSibType2-7, posSibType2-8, posSibType2-9, posSibType2-10, posSibType2-11,

posSibType2-12, posSibType2-13, posSibType2-14, posSibType2-15, posSibType2-16,

posSibType2-17, posSibType2-17a, posSibType2-18, posSibType2-18a, posSibType2-19,

posSibType2-20, posSibType2-20a, posSibType2-21, posSibType2-22, posSibType2-23,

posSibType2-24, posSibType2-25, posSibType2-26, posSibType2-27, posSibType3-1,

posSibType4-1, posSibType5-1, posSibType6-1, posSibType6-2, posSibType6-3, posSibType6-4,

posSibType6-5, posSibType6-6, posSibType6-7, posSibType7-1, posSibType7-2, posSibType7-3,

posSibType7-4, spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1,

... }

}

-- TAG-REMOTEUEINFORMATIONSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| *RemoteUEInformationSidelink-IEs* field descriptions |
| ***connectionForMP***  Indicates the connected L2 U2N Relay UE by the L2 U2N Remote UE that the access is for MP. |
| ***sl-DestinationIdentityRemoteUE***  Indicates the peer L2 U2U Remote UE upon end-to-end PC5 connection failure or release. |
| ***sl-PagingCycleRemoteUE***  Indicates the L2 U2N Remote UE's UE specific DRX cycle as the minimum value of the one provided by upper layers (if configured) and the one provided by RRC layer (if configured). Value rf32 corresponds to 32 radio frames, value rf64 corresponds to 64 radio frames and so on. |
| ***sl-PagingIdentityRemoteUE***  Indicates the L2 U2N Remote UE's paging UE ID. |
| ***sl-PagingInfo-RemoteUE***  Indicates the paging information used by L2 U2N Relay UE [RIL]: O502, SLRelay or L2 Last U2N Relay UE to perform the connected L2 U2N Remote UE's or the connected child UE's paging monitoring. |
| ***SL-PagingInfo-RemoteUE-List***  Contains a list of paging information for the downstream remote UEs |
| ***sl-RequestedPosSIB-List***  Contains a list of requested PosSIBs. |
| ***sl-RequestedSIB-List***  Contains a list of requested SIBs. |
| ***sl-SFN-DFN-OffsetRequested***  If present, this field indicates that the L2 U2N Remote UE requests the L2 U2N Relay UE to provide the SFN-DFN offset in a subsequent *RRCReconfigurationSidelink* message. |
| ***SL-SIB-ReqInfo***  Indicates the requested SIB type. Values sibNotReq11, sibNotReq10, …, sibNotReq1 shall be ignored by L2 U2N relay UE (i.e., no SIB requested). |

| Conditional presence | Explanation |
| --- | --- |
| *GNSS-ID-SBAS* | The field is mandatory present if *gnss-id* is set to *sbas*. It is absent otherwise. |

=================================NEXT CHANGE=======================================

#### – *UuMessageTransferSidelink*

The *UuMessageTransferSidelink* message is used for the sidelink transfer of Paging message and System Information messages.

Signalling radio bearer: SL-SRB3

RLC-SAP: AM

Logical channel: SCCH

Direction: L2 U2N Relay UE to L2 U2N Remote UE or U2N Parent UE to U2N Child UE

*UuMessageTransferSidelink* message

-- ASN1START

-- TAG-UUMESSAGETRANSFERSIDELINK-START

UuMessageTransferSidelink-r17 ::= SEQUENCE {

criticalExtensions CHOICE {

uuMessageTransferSidelink-r17 UuMessageTransferSidelink-r17-IEs,

criticalExtensionsFuture SEQUENCE {}

}

}

UuMessageTransferSidelink-r17-IEs ::= SEQUENCE {

sl-PagingDelivery-r17 OCTET STRING (CONTAINING PagingRecord) OPTIONAL, -- Need N

sl-SIB1-Delivery-r17 OCTET STRING (CONTAINING SIB1) OPTIONAL, -- Need N

sl-SystemInformationDelivery-r17 OCTET STRING (CONTAINING SystemInformation) OPTIONAL, -- Need N

lateNonCriticalExtension OCTET STRING OPTIONAL,

nonCriticalExtension UuMessageTransferSidelink-v1800-IEs OPTIONAL

}

UuMessageTransferSidelink-v1800-IEs ::= SEQUENCE {

sl-PagingDelivery-r18 OCTET STRING (CONTAINING PagingRecord-v1700) OPTIONAL, -- Need N

nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-UUMESSAGETRANSFERSIDELINK-STOP

-- ASN1STOP

|  |
| --- |
| *UuMessageTransferSidelink-IEs* field descriptions |
| ***sl-PagingDelivery***  This field is used to transfer PagingRecord and *PagingRecord-v1700* relevant to the L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE. |
| ***sl-SIB1-Delivery***  This field is used to transfer SIB1 to the L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE. |
| ***sl-SystemInformationDelivery***  This field is used to transfer SIBs and posSIBs to the L2 U2N Remote UE in RRC\_IDLE or RRC\_INACTIVE. |

#### – *End of PC5-RRC-Definitions*

-- ASN1START

END

-- ASN1STOP

=================================NEXT CHANGE=======================================

## 9.3 Sidelink pre-configured parameters

This ASN.1 segment is the start of the NR definitions of pre-configured sidelink parameters.

#### – *NR-Sidelink-Preconf*

-- ASN1START

-- TAG-NR-SIDELINK-PRECONF-DEFINITIONS-START

NR-Sidelink-Preconf DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

SL-RelayUE-ConfigMH-r19,

SL-RelayUE-ConfigU2U-r18,

SL-RemoteUE-ConfigU2U-r18,

SL-RelayUE-ConfigU2U-v1840,

SL-RemoteUE-ConfigU2U-v1830,

SL-RemoteUE-Config-r17,

SL-DRX-ConfigGC-BC-r17,

SL-Freq-Id-r16,

maxNrofFreqSL-1-r18,

SL-FreqConfigCommon-r16,

SL-RadioBearerConfig-r16,

SL-RLC-BearerConfig-r16,

SL-EUTRA-AnchorCarrierFreqList-r16,

SL-NR-AnchorCarrierFreqList-r16,

SL-MeasConfigCommon-r16,

SL-UE-SelectedConfig-r16,

TDD-UL-DL-ConfigCommon,

maxNrofFreqSL-r16,

maxNrofSLRB-r16,

maxSL-LCID-r16,

SL-FreqConfigCommonExt-v16k0

FROM NR-RRC-Definitions;

-- TAG-NR-SIDELINK-PRECONF-DEFINITIONS-STOP

-- ASN1STOP

#### – *SL-PreconfigurationNR*

The IE *SL-PreconfigurationNR* includes the sidelink pre-configured parameters used for NR sidelink communication. Need codes or conditions specified for subfields in *SL-PreconfigurationNR* do not apply.

*SL-PreconfigurationNR* information elements

-- ASN1START

-- TAG-SL-PRECONFIGURATIONNR-START

SL-PreconfigurationNR-r16 ::= SEQUENCE {

sidelinkPreconfigNR-r16 SidelinkPreconfigNR-r16,

...,

[[

sidelinkPreconfigNR-v16k0 SidelinkPreconfigNR-v16k0

]]

}

SidelinkPreconfigNR-r16 ::= SEQUENCE {

sl-PreconfigFreqInfoList-r16 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigCommon-r16 OPTIONAL,

sl-PreconfigNR-AnchorCarrierFreqList-r16 SL-NR-AnchorCarrierFreqList-r16 OPTIONAL,

sl-PreconfigEUTRA-AnchorCarrierFreqList-r16 SL-EUTRA-AnchorCarrierFreqList-r16 OPTIONAL,

sl-RadioBearerPreConfigList-r16 SEQUENCE (SIZE (1..maxNrofSLRB-r16)) OF SL-RadioBearerConfig-r16 OPTIONAL,

sl-RLC-BearerPreConfigList-r16 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL,

sl-MeasPreConfig-r16 SL-MeasConfigCommon-r16 OPTIONAL,

sl-OffsetDFN-r16 INTEGER (1..1000) OPTIONAL,

t400-r16 ENUMERATED{ms100, ms200, ms300, ms400, ms600, ms1000, ms1500, ms2000} OPTIONAL,

sl-MaxNumConsecutiveDTX-r16 ENUMERATED {n1, n2, n3, n4, n6, n8, n16, n32} OPTIONAL,

sl-SSB-PriorityNR-r16 INTEGER (1..8) OPTIONAL,

sl-PreconfigGeneral-r16 SL-PreconfigGeneral-r16 OPTIONAL,

sl-UE-SelectedPreConfig-r16 SL-UE-SelectedConfig-r16 OPTIONAL,

sl-CSI-Acquisition-r16 ENUMERATED {enabled} OPTIONAL,

sl-RoHC-Profiles-r16 SL-RoHC-Profiles-r16 OPTIONAL,

sl-MaxCID-r16 INTEGER (1..16383) DEFAULT 15,

...,

[[

sl-DRX-PreConfigGC-BC-r17 SL-DRX-ConfigGC-BC-r17 OPTIONAL,

sl-TxProfileList-r17 SL-TxProfileList-r17 OPTIONAL,

sl-PreconfigDiscConfig-r17 SL-RemoteUE-Config-r17 OPTIONAL

]],

[[

sl-PreconfigFreqInfoListSizeExt-v1800 SEQUENCE (SIZE (1..maxNrofFreqSL-1-r18)) OF SL-FreqConfigCommon-r16 OPTIONAL,

sl-RLC-BearerConfigListSizeExt-v1800 SEQUENCE (SIZE (1..maxSL-LCID-r16)) OF SL-RLC-BearerConfig-r16 OPTIONAL,

sl-SyncFreqList-r18 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-Freq-Id-r16 OPTIONAL,

sl-SyncTxMultiFreq-r18 ENUMERATED {true} OPTIONAL,

sl-PreconfigDiscConfig-v1800 SL-PreconfigDiscConfig-v1800 OPTIONAL,

sl-PosPreconfigFreqInfoList-r18 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigCommon-r16 OPTIONAL

]],

[[

t400-U2U-r18 ENUMERATED {ms200, ms400, ms600, ms800, ms1200, ms2000, ms3000, ms4000} OPTIONAL

]],

[[

sl-PreconfigDiscConfig-v1840 SL-PreconfigDiscConfig-v1840 OPTIONAL

]],

[[

sl-PreconfigDiscConfig-v19xy SL-PreconfigDiscConfig-v19xy OPTIONAL

]]

}

SidelinkPreconfigNR-v16k0 ::= SEQUENCE {

sl-PreconfigFreqInfoListExt-v16k0 SEQUENCE (SIZE (1..maxNrofFreqSL-r16)) OF SL-FreqConfigCommonExt-v16k0 OPTIONAL

}

SL-TxProfileList-r17 ::= SEQUENCE (SIZE (1..256)) OF SL-TxProfile-r17

SL-TxProfile-r17 ::= ENUMERATED {drx-Compatible, drx-Incompatible, spare6, spare5, spare4, spare3,spare2, spare1}

SL-PreconfigGeneral-r16 ::= SEQUENCE {

sl-TDD-Configuration-r16 TDD-UL-DL-ConfigCommon OPTIONAL,

reservedBits-r16 BIT STRING (SIZE (2)) OPTIONAL,

...

}

SL-RoHC-Profiles-r16 ::= SEQUENCE {

profile0x0001-r16 BOOLEAN,

profile0x0002-r16 BOOLEAN,

profile0x0003-r16 BOOLEAN,

profile0x0004-r16 BOOLEAN,

profile0x0006-r16 BOOLEAN,

profile0x0101-r16 BOOLEAN,

profile0x0102-r16 BOOLEAN,

profile0x0103-r16 BOOLEAN,

profile0x0104-r16 BOOLEAN

}

SL-PreconfigDiscConfig-v1800 ::= SEQUENCE {

sl-RelayUE-PreconfigU2U-r18 SL-RelayUE-ConfigU2U-r18,

sl-RemoteUE-PreconfigU2U-r18 SL-RemoteUE-ConfigU2U-r18

}

SL-PreconfigDiscConfig-v1840 ::= SEQUENCE {

sl-RelayUE-PreconfigU2U-v1840 SL-RelayUE-ConfigU2U-v1840,

sl-RemoteUE-PreconfigU2U-v1840 SL-RemoteUE-ConfigU2U-v1830

}

SL-PreconfigDiscConfig-v19xy ::= SEQUENCE {

sl-RelayUE-PreconfigMH-r19 SL-RelayUE-ConfigMH-r19

}

-- TAG-SL-PRECONFIGURATIONNR-STOP

-- ASN1STOP

| *SL-PreconfigurationNR* field descriptions |
| --- |
| ***sl-DRX-PreConfig-GC-BC***  This field indicates the sidelink DRX configuration for groupcast and broadcast communication, as specified in TS 38.321 [3]. |
| ***sl-OffsetDFN***  Indicates the timing offset for the UE to determine DFN timing when GNSS is used for timing reference. Value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002 milliseconds, and so on. If the field is absent, no offset is applied. |
| ***sl-PosPreconfigFreqInfoList***  This field indicates the NR sidelink positioning carrier frequencies of SL-PRS dedicated resource pool for SL-PRS transmission and reception. In this release, only one entry of *SL-FreqConfigCommon* is included in the list. |
| ***sl-PreconfigDiscConfig***  This field indicates the configuration for discovery message transmission used by NR sidelink U2N Remote UE, used by NR sidelink U2U Relay UE or used by NR sidelink U2U Remote UE. |
| ***sl-PreconfigEUTRA-AnchorCarrierFreqList***  This field indicates the EUTRA anchor carrier frequency list, which can provide the NR sidelink communication configuration. |
| ***sl-PreconfigFreqInfoList, sl-PreconfigFreqInfoListSizeExt, sl-PreconfigFreqInfoListExt***  This field indicates the NR sidelink communication and/ or NR sidelink discovery configuration some carrier frequency(ies). In this release, only one *SL-FreqConfig* can be configured in *sl-PreconfigFreqInfoList*. More entries of SL-FreqConfig can be configured in *sl-PreconfigFreqInfoListSizeExt*. If *sl-PreconfigFreqInfoListExt* is included, it contains the same number of entries, and listed in the same order, as in *sl-PreconfigFreqInfoList* together with *sl-PreconfigFreqInfoListSizeExt*. The first entry corresponds to the AdditionalSpectrumEmission of the frequency of first entry in *sl-PreconfigFreqInfoList*, the second entry corresponds to the AdditionalSpectrumEmission of the frequency of first entry in *sl-PreconfigFreqInfoListSizeExt*, the third entry corresponds to the AdditionalSpectrumEmission of the frequency of second entry in *sl-PreconfigFreqInfoListSizeExt* and so on. |
| ***sl-PreconfigNR-AnchorCarrierFreqList***  This field indicates the NR anchor carrier frequency list, which can provide the NR sidelink communication configuration. |
| ***sl-RadioBearerPreConfigList***  This field indicates one or multiple sidelink radio bearer configurations. |
| ***sl-RLC-BearerPreConfigList, sl-RLC-BearerPreConfigListSizeExt***  This field indicates one or multiple sidelink RLC bearer configurations. |
| ***sl-RoHC-Profiles***  This field indicates the supported RoHC profiles for NR sidelink communications. |
| ***sl-SSB-PriorityNR***  This field indicates the priority of NR sidelink SSB transmission and reception. |
| ***sl-SyncFreqList***  Indicates a list of candidate carrier frequencies that can be used for the synchronisation of NR sidelink communication. For *SL-Freq-Id-r16*, the value 1 corresponds to the frequency of first entry in *sl-PreconfigFreqInfoList*, the value 2 corresponds to the frequency of first entry in *sl-PreconfigFreqInfoListSizeExt*, the value 3 corresponds to the frequency of second entry in *sl-PreconfigFreqInfoListSizeExt* and so on. |
| ***sl-SyncTxMultiFreq***  Indicates that the UE transmits S-SSB on multiple carrier frequencies for NR sidelink communication. If this field is absent, the UE transmits S-SSB only on the synchronisation carrier frequency. |
| ***sl-TxProfileList***  List of one or multiple Tx profiles, indicating the compatibility of supporting SL DRX as specified in TS 38.321 [3]. Value *drx-Compatible* means SL DRX is supported, and value *drx-Incompatible* means SL DRX is not supported. It is up to the UE implementation whether/how to apply this field. |
| ***t400***  Indicates the value for timer T400 as described in clause 7.1. Value *ms100* corresponds to 100 ms, value *ms200* corresponds to 200 ms and so on. |
| ***t400-U2U***  Indicates the value for timer T400 to be applied for end-to-end PC5 connection in sidelink U2U relay operation as described in clause 7.1. Value *ms200* corresponds to 200 ms, value *ms400* corresponds to 400 ms and so on. |

#### – *End of NR-Sidelink-Preconf*

-- ASN1START

END

-- ASN1STOP

=================================NEXT CHANGE=======================================

9.4 Radio Information Related to Discovery Message

This clause specifies RRC information elements that are transferred in Discovery Message.

#### – *SL-AccessInfo-L2U2N*

The IE *SL-AccessInfo-L2U2N* includes the radio information included in Discovery Message used for L2 U2N relay operation.

*SL-AccessInfo-L2U2N* information elements

-- ASN1START

-- TAG-SL-ACCESSINFO-L2U2N-START

NR-Sidelink-DiscoveryMessage DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

CellAccessRelatedInfo,

SL-ServingCellInfo-r17,

SL-RelayIndicationMP-r18

FROM NR-RRC-Definitions;

SL-AccessInfo-L2U2N-r17 ::= SEQUENCE {

cellAccessRelatedInfo-r17 CellAccessRelatedInfo,

sl-ServingCellInfo-r17 SL-ServingCellInfo-r17,

...,

[[

sl-RelayIndication-r18 SL-RelayIndicationMP-r18 OPTIONAL

]],

[[

relayUE-RRCState-r19[RIL]: E045, SLRelay ENUMERATED {rrc-Connected, spare1} OPTIONAL

]]

}

END

-- TAG-SL-ACCESSINFO-L2U2N-STOP

-- ASN1STOP

=================================END OF CHANGES=======================================