**3GPP TSG-CT WG1 Meeting #141eC1-232146**

**Online 17– 21 April 2023**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Pseudo-CR on** **A2X PC5 unicast link release procedure**

**Spec: 3GPP TS 24.577 v0.0.0**

**Agenda item: 18.2.21**

**Document for: Approval**

**1. Introduction**

This p-CR provides content of A2X PC5 unicast link release procedure (Section 6.1.2.4) in 3GPP TS 24.577 specification related to the UAS\_Ph2 work item.

**2. Reason for Change**

A2X PC5 unicast link release procedure (Section 6.1.2.4) in 3GPP TS 24.577 specification needs to be defined based on SA2 requirements in clause 4.2.1.2.1 and clause 5.4.4 in 3GPP TS 23.256.

**3. Proposal**

It is proposed to agree the following changes to 3GPP TS 24.577 v0.0.0.

\* \* \* First Change \* \* \* \*

#### 6.1.2.4 A2X PC5 unicast link release procedure

##### 6.1.2.4.1 General

The A2X PC5 unicast link release procedure is used to release an A2X PC5 unicast link between two UEs. The link can be released from either end point. The UE sending the A2X DIRECT LINK RELEASE REQUEST message is called the "initiating UE" and the other UE is called the "target UE".

If the UE receives an indication of radio link failure from the lower layer, the UE shall release the A2X PC5 unicast link locally after an implementation specific time.

Editor's note (pCR, UAS\_Ph2): security requirements to be added based on SA3 conclusions when available.

##### 6.1.2.4.2 A2X PC5 unicast link release procedure initiation by initiating UE

The initiating UE shall initiate the procedure if a request from upper layers to release an A2X PC5 unicast link with the target UE which uses a known layer-2 ID (for unicast communication) is received and there is an existing A2X PC5 unicast link between these two UEs.

The initiating UE may initiate the procedure if the target UE has been non-responsive, e.g. no response in the A2X PC5 unicast link modification procedure, A2X PC5 unicast link identifier update procedure, A2X PC5 unicast link re-keying procedure or A2X PC5 unicast link keep-alive procedure.

The initiating UE may initiate the procedure to release an established A2X PC5 unicast link if the UE has reached the maximum number of established A2X PC5 unicast links and there is a need to establish a new A2X PC5 unicast link. In this case, which A2X PC5 unicast link is to be released is up to UE implementation.

The initiating UE may initiate the procedure to release an established A2X PC5 unicast link upon expiry of the timer Tbbbb.

In order to initiate the A2X PC5 unicast link release procedure, the initiating UE shall create an A2X DIRECT LINK RELEASE REQUEST message with a PC5 signalling protocol cause IE indicating one of the following cause values:

#1 direct communication to the target UE not allowed;

#2 direct communication to the target UE no longer needed;

#4 direct connection is not available anymore;

#5 lack of resources for A2X PC5 unicast link; or

#111 protocol error, unspecified.

Editor's note (pCR, UAS\_Ph2): security requirements to be added based on SA3 conclusions when available.

After the A2X DIRECT LINK RELEASE REQUEST message is generated, the initiating UE shall pass this message to the lower layers for transmission along with the initiating UE's layer-2 ID for unicast communication and the target UE's layer-2 ID for unicast communication, and shall stop Tyyyy if running. The initiating UE shall start timer Tcccc.



Figure 6.1.2.4.2.1: A2X PC5 unicast link release procedure

##### 6.1.2.4.3 A2X PC5 unicast link release procedure accepted by the target UE

Upon receiving an A2X DIRECT LINK RELEASE REQUEST message, the target UE shall stop all running timers for this A2X PC5 unicast link and abort any other ongoing PC5 signalling protocol procedures on this A2X PC5 unicast link. The target UE shall respond with an A2X DIRECT LINK RELEASE ACCEPT message. After the message is sent, the target UE shall release the A2X PC5 unicast link by performing the following behaviors:

a) inform the lower layer along with the PC5 link identifier that the A2X PC5 unicast link has been released; and

b) delete the A2X PC5 unicast link context of the A2X PC5 unicast link after an implementation specific time.

Editor's note (pCR, UAS\_Ph2): security requirements to be added based on SA3 conclusions when available.

##### 6.1.2.4.4 A2X PC5 unicast link release procedure completion by the initiating UE

Upon receipt of the A2X DIRECT LINK RELEASE ACCEPT message, the initiating UE shall stop timer Tcccc and shall release the A2X PC5 unicast link by performing the following actions:

a) inform the lower layer along with the PC5 link identifier that the A2X PC5 unicast link has been released; and

b) delete the A2X PC5 unicast link context of the A2X PC5 unicast link after an implementation specific time.

Editor's note (pCR, UAS\_Ph2): security requirements to be added based on SA3 conclusions when available.

##### 6.1.2.4.5 Abnormal cases

###### 6.1.2.4.5.1 Abnormal cases at the initiating UE

If retransmission timer Tcccc expires and the PC5 signalling protocol cause included in the PC5 signalling protocol cause IE in the A2X DIRECT LINK RELEASE REQUEST message was #4 "direct connection is not available anymore", the initiating UE shall release the A2X PC5 unicast link locally. From this time onward the initiating UE shall no longer send or receive any messages via this link.

Editor's note (pCR, UAS\_Ph2): security requirements to be added based on SA3 conclusions when available.

If retransmission timer Tcccc expires and the PC5 signalling protocol cause included in the PC5 signalling protocol cause IE in the A2X DIRECT LINK RELEASE REQUEST message was not #4 "direct connection is not available anymore", the initiating UE shall initiate the transmission of the A2X DIRECT LINK RELEASE REQUEST message again and restart timer Tcccc.

If no response is received from the target UE after reaching the maximum number of allowed retransmissions, the initiating UE shall release the A2X PC5 unicast link locally. From this time onward the initiating UE shall no longer send or receive any messages via this link.

Editor's note (pCR, UAS\_Ph2): security requirements to be added based on SA3 conclusions when available.

NOTE: The maximum number of allowed retransmissions is UE implementation specific.

\* \* \* End of Changes \* \* \* \*