**3GPP TSG SA WG5 Meeting #156 *S5-244523***

**Maastricht, The Netherlands 19 - 23 August 2024**

**Source: China Mobile**

**Title: TR 28.853 Introduction of background**

**Document for: Approval**

**Agenda Item: 7.5.4**

# 1 Decision/action requested

***This is a pCR to introduce the background in TR 28.853.***

# 2 References

[1] 3GPP TR 28.853: "Charging management; Study on charging aspects of uncrewed aerial systems".

# 3 Rationale

This contribution proposes to introduce the background in TR 28.853.

# 4 Detailed proposal

The following changes are proposed to be incorporated into TR 28.853 [1].

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| **First change** |

# 4 Background

## 4.1 General

As defined in TS 22.125 [2], an Uncrewed Aerial System (UAS) is the combination of an Uncrewed Aerial Vehicle (UAV) and a UAV controller. The communication requirements cover both the Command and Control (C2), and uplink and downlink data to/from the UAS components towards both the serving 3GPP network and network servers.

In SA1, the requirements for UAS support in 3GPP are documented in TS 22.125 [2]. In SA2, there are two study items and two work items which are related to UAS in Release 17 and Release 18. The corresponding normative work is documented in TS 23.256 [3], TS 23.501 [4], TS 23.502 [5], TS 23.503 [6]. This study item will focus on charging solutions to support UAS based on the progress of SA1 and SA2 in Release 17 and Release 18.

## 4.2 Architecture for Support of Uncrewed Aerial Systems

The architecture for support of UAS connectivity, identification and tracking is defined in TS 23.256 [3]. The logical 5GS and EPS architecture for UAV is showned in Figure 4.2-1, and the 5G System non-roaming architecture for UAVs and for A2X communication over PC5 and Uu reference points is showned in Figure 4.2-2.



Figure 4.2-1: Logical 5GS and EPS architecture for UAV

The UAV is a 3GPP UE supporting the UE functionality and is configured for UAS services depicted in clause 4.3.3 of TS 23.256 [3]. UAV functionality can be provided by 5GC connected to NG-RAN and EPC connected to LTE. For EPC, the PDN connections used by UAV are always served by SMF+PGW-C.

The UAS Network Function is supported by the NEF or SCEF+NEF and used for external exposure of services to the UAS Service Supplier (USS), which makes use of existing NEF/SCEF exposure services.



Figure 4.2-2: 5G System non-roaming architecture for UAVs and for A2X communication

Roaming 5G System architecture for UAVs and for A2X communication over PC5 and Uu reference points is defined in clause 4.2.4 of TS 23.256 [3]. It is assumed that access to USS is in the VPLMN, thus packet data connectivity for UAV-USS communication is in local breakout, and the UAS NF function is located in the VPLMN, regardless of whether the roaming architecture is home routed or local breakout.

## 4.3 Business roles

Uncrewed Aerial System involves the services or capabilities may be provided by multiple service providers in the form of following business roles:

- UAS Mobile Network Operator (UAS-MNO): a 3GPP network operator who can provide UAS services for UAS service customer, i.e. MNO.

- UAS Service Provider (UAS-SP): a service provider who can provide UAS services for UAS service customer via the 3GPP system, e.g. USS, UTM.

- UAS Service Customer (UAS-SC): a service customer who is able to consume UAS services, i.e. UAV.

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| **End of changes** |