**3GPP TSG-SA WG6 Meeting #38-e S6-201040**

**e-meeting, 20th – 31st July 2020**

**Source: Tencent**

**Title: Pseudo-CR on key issue x: UTM/USS service handoff**

**Spec: 3GPP R 23.755**

**Agenda item: 8.5**

**Document for: Approval**

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**1. Introduction**

A UAV may need to obtain flight authorization from a connected USS/UTM service while doing pre-flight before take-off. However, USS or UTM service might need to be handed off to different USS/UTM server while UAV is airborne following a specific fly path. In either case, decision-making on a USS/UTM service selection/handoff may need to take into consideration for UAV UE.

Per UAS traffic management requirement specified in TS 22.125:

* [R-5.2.1-001] The 3GPP system shall provide a mechanism for a UTM to provide route data, along with flight clearance, to a UAV.
* [R-5.2.1-002] The 3GPP system shall be able to deliver route modification information received from a UTM to a UAS with a latency of less than 500ms.
* [R-5.2.1-003] The 3GPP system shall be able to deliver the notifications received from a UTM to a UAV controller with a latency of less than 500ms.

The USS/UTM for a UAV flight operation may have significant impact on service performance provided by 3GPP network. There are a few scenarios where service handoff may happen:

* An initial USS/UTM connection during pre-flight, that means while UAV is on the ground, Or
* A pre-assigned USS/UTM service a UAV MUST connect after airborne, Or
* A dynamic USS/UTM change while a UAV fly into a new USS/UTM service converge area. Or
* There are multiple USS/UTM services at the same area, which one to choose?

The FAA is paying a great attention on ASTM WK63418, the “New Specification for Service provided under UAS Traffic Management (UTM)”. This will give SA6 more guidance how UAV application layer may communicate with a USS/UTM server, besides the existing FAA LANNC program.

This pCR proposes a key issue on UTM/USS service handoff.

**2. Reason for Change**

In the general aviaiton, flight service handoff happens often when aircraft is outside of the current ATC controlled area. Image a UAV flight a long distance mission following a path preset by a USS/UTM service supplier. A service handoff may happen when UAV is outside of its current USS/UTM’s service area. Therefore, a study on service handoff is necessary.

**3. Conclusions**

**4. Proposal**

It is proposed to agree the following changes to 3GPP TR 23.755

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

## 5.x Key issue #X: USS/UTM service handoff

~~A UAV UE may be connected to one USS/UTM at a time and there maybe a need to hand off to a different service supplier due to service coverage or reasons related to traffic management. Such handoff may have impacts on performance provided by 3GPP network as described in Clause 7 of stage 1 TS 22.125.~~

USS/UTM Service handoff may happen any time after UAV’s initial authentication through 3GPP network. Depends on the different communication mode such as C2 or live payload transfer, service handoff may have an impact if UAE server(s) have already maintained a connection either directly with a multimedia service through a xMB interface [10] or a NEF interface [8].

Hence, it is required to study the following:

- ~~Whether application design should consider USS/UTM service handoff.~~

- Whether service handoff has QoS implications with UAV operations (ex. mission payload, C2 communication)

- Whether and how UAE/SEAL reacts when service supplier changes.

NOTE: SA2 is responsible for UAV flight authorization and authentication after a proper USS/UTM service is chosen