**3GPP TSG-CT WG1 Meeting #137-eC1-225160**

**E-Meeting, 18th – 26th August 2022**

Title: LS on UE selecting a non-allowed TAI in satellite access broadcasting multiple TACs per cell

Response to: N/A

Release: Rel-17

Work Item: 5GSAT\_ARCH-CT

Source: CT1

To: SA2

Cc: -

**Contact Person:**

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Attachments: None

**1. Overall Description:**

In their work on NR satellite access and the topic of multiple broadcast TAIs, CT1 has noted the stage 2 requirements for service area restrictions in TS 23.501, clause 5.4.11.8:

The AMF receives the broadcast TAI (if a single TAI is broadcast) or all broadcast TAIs (if multiple TAIs are broadcast) from the NG-RAN as described clause 5.4.11.7. The AMF provides the UE with Service Area Restrictions which consist of either Allowed Areas or Non-Allowed Areas, as described in clause 5.3.4.1.2. The UE and AMF consider the UE to be in a Non-Allowed Area if none of the broadcast TAIs is Allowed. The UE and AMF consider the UE to be in an Allowed Area if at least one broadcast TAI is allowed.

The corresponding stage 3 requirements to select a current TAI from multiple broadcast TAIs are specified in TS 24.501, clause 4.23.5, where the UE selects the TAI from the TACs supported by the selected PLMN.

Note, however, that for the case when the satellite cell is a shared network cell, then there is an additional requirement on PLMN selection applicable which is specified in TS 23.122, clause 4.4.3: when a selected cell is a suitable cell for multiple PLMN identities, then the UE is mandated to select the registered PLMN if is available among these PLMN identities.

Since logically PLMN selection is taking place before determination of the current TAI, the requirement from TS 23.122 takes precedence.

As a result, it is possible that when all of the following is fulfilled:

* the network is allocating TAI lists including TAIs from different, equivalent PLMNs,
* the network is broadcasting multiple TAIs in its satellite NG-RAN cells,
  + whereby these TAIs belong to different, equivalent PLMNs, and
  + TAIs of one PLMN belong to the allowed area whereas TAIs of the equivalent PLMN belong to the non-allowed area,

then

* there can be cases where the UE selects a TAI that is part of the non-allowed area (because it belongs to the registered PLMN) although there would be an allowed TAI of an equivalent PLMN available. Note that this can occur both when the UE is actually located in an allowed TAI and when it is located in a non-allowed TAI.

One example for such a case is as follows:

* The UE is assigned a registration area that contains at least one equivalent PLMN in addition to the registered PLMN;
* The UE is assigned an allowed area;
* The TACs of the registered PLMN which are part of the broadcast TAI list are not in the allowed area;
* The UE receives broadcast information in a satellite cell where at least one TAC of an equivalent PLMN part of the broadcast TAI list is included in the allowed area.

CT1 has not made a systematic study of possible other corner cases, including the scenario above when the UE could select a TAI that is part of the allowed area, and has decided to not make any changes to specification under CT1 remit because of the above-described scenario, but would like to inform SA2 of these observations.

**2. Actions:**

**To SA2 group.**

**ACTION:** CT1 requests SA2 take the information provided into account.

**3. Date of Next CT1 Meetings:**

CT1#138e 10th – 14th October 2022 e-meeting

CT1#139 14th – 18th November 2022 TBD