**3GPP TSG-CT WG1 Meeting #134-e *C1-221990***

**E-Meeting, 17th – 25th February 2022 was C1-221273**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **24.301** | **CR** | **3616** | **rev** | **6** | **Current version:** | **17.5.0** |  |
|  | | | | | | | | |
| *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 |  | Core Network | **X** |

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| ***Title:*** | General subclause for NTN IoT in EPS | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | MediaTek Inc., Huawei, HiSilicon, Vodafone | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | IoT\_SAT\_ARCH\_EPS | | | | |  | ***Date:*** | | | 2022-02-24 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | IoT NTN access for EPS needs to be introduced in TS 24.301. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Subclause added to introduce NTN IoT in EPS. | | | | | | | | |
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| ***Consequences if not approved:*** | | Satellite access is not supported for Cellular IoT in EPS. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.xx (new), 4.xx.1 (new), 4.xx.2 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

## 4.xx Satellite access for CIoT

### 4.xx.1 General

The UE and the network may support satellite access in WB-S1 mode or NB-S1 mode with CIoT EPS optimization. Support for E-UTRAN and NB-IoT satellite access is specified in TS 36.300 [20].

An MME can determine a UE is accessing the network using a satellite access in NB-S1 mode or WB-S1 mode and the network may enforce mobility restriction for the UE as specified in 3GPP TS 23.401 [10].

### 4.xx.2 Handling list of "PLMNs not allowed to operate at the present UE location"

The UE attempting to use a PLMN over satellite access may be rejected by the EMM cause #78 received in ATTACH REJECT message, TRACKING AREA UPDATE REJECT message or DETACH REQUEST message.

The EMM cause #78 is only applicable for the UE accessing a PLMN using a satellite access in EPS.

For satellite access the UE shall store a list of "PLMN not allowed to operate at the present UE location". Each entry in the list consist of:

a) PLMN identity of the PLMN which sent a message including EMM cause value #78 "PLMN not allowed to operate at the present UE location" via satellite access technology; and

b) geographical location, if known by the UE, where EMM cause value #78 was received over satellite access technology.

Editor's note: A minimum value can be optionally provided by the network in the same message as cause value #78, but IE naming and definition is FFS.

Before storing a new entry in the list, the UE shall delete any existing entry with the same PLMN identity. Upon storing a new entry, the UE starts a timer instance associated with the entry with an implementation specific value that shall not be set to a value smaller than the timer value indicated by the network, if any.

The UE shall not attempt to access a PLMN via satellite access technology in EPS which is part of the list of "PLMNs not allowed to operate at the present UE location" if:

a) the current UE location is known, a geographical location is stored for the entry of this PLMN, and the distance from location where EMM cause value #78 was received to the current UE location is smaller than a UE implementation specific value. This UE implementation specific value shall not be set to a value smaller than the value indicated by the network, if any; and

Editor's note: A minimum value can be optionally provided by the network in the same message as cause value #78, but IE naming and definition is FFS.

b) the timer associated with the entry of this PLMN is running.

NOTE: If the current location is not known or the geographic location is not stored for the entry of this PLMN, condition a) is ignored.

The list shall accommodate three or more entries. When the list is full and a new entry has to be inserted, the oldest entry shall be deleted.

Each entry shall be removed from the list of "PLMN not allowed to operate at the present UE location" if for the entry:

a) the UE successfully registers to the PLMN stored in the entry; or

b) the timer instance associated with the entry expires.

The UE may remove an entry from the list of "PLMN not allowed to operate at the present UE location" if the distance from location where EMM cause value #78 was received to the current UE location exceeds the UE implementation specific value.

When the UE is switched off, the UE shall keep the list of "PLMNs not allowed to operate at the present UE location" in its non-volatile memory together with the SUPI from the USIM. The UE shall delete the list of "PLMNs not allowed to operate at the present UE location" if the USIM is removed.