**3GPP TSG-SA1 Meeting #96e *S1-21xxxx***

**Electronic Meeting, 8 – 18 November 2021** *(revision of S1-21xxxx)*

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **22.847** | **CR** | **<CR#>** | **rev** | **<Rev#>** | **Current version:** | **18.0.0** |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network |  | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Clean up EN and TBD in KPI table in TR22.847 clause 5.2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Mobile | | | | | | | | | |
| ***Source to TSG:*** | SA1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_TACMM | | | | |  | ***Date:*** | | | 2021-10-14 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | F |  | | | | | ***Release:*** | | | Rel-18 |
|  | *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:*** | | There’s TBD and EN left in clause 5.2 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Deleting EN and solving TBD in KPI table regarding reference from TS22.104 | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | TR 22.847 will left some unsolved problems. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.6 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

**--------- The 1st change ---------**

5.2 Remote control robot

5.2.1 Description

Human can use Remote control robot to operate some actions which they are not able to be on the spot. With real-time and synchronous visual, audio and haptic feedback, remote robot operator will perform reactions suitable for the situation, and remote control robot can follow operator’s action to do the exact work. This can be used in many different scenarios. It can be applied to remote care for elderly, remote detonation, remote operation, remote maintenance of facility, remote firefighting, etc.

5.2.2 Pre-conditions

Alice is the operator of a remote robot for maintaining underground pipe. She has a sticker which has the same Dof and structure with the maintain tool on the remote robot. Both Alice and robot is connected to a 5G network with the ability to transfer video, audio and haptic information.

5.2.3 Service Flows

1. Remote robot is at the spot of a damaged underground pipe, using integrated camera and sensor to send back video, audio and haptic information.
2. Alice hold the control stick and can receive the haptic information, and receive the video, audio information synchronous on the screen and from the sound.
3. After analysing these information, Alice perform the next move on the operator sticker.
4. The haptic information including force and DOF transfer to remote robot, and the robot performs the same action.

5.2.4 Post-conditions

Alice can remotely control the robot to finish the maintaining work.

5.2.5 Existing features partly or fully covering the use case functionality

In 3GPP TS 22.263 [4], there are requirements for supporting video, imaging and audio for professional applications.

5.2.6 Potential New Requirements needed to support the use case

[PR 5.2.6-1] 5G system shall be able to support tactile and multi-modality communication service with following KPIs.

**Table 5.2.6-2: Potential Key performance requirements for remote control robot**

| **Use Cases** | **Characteristic parameter (KPI)** | | | **Influence quantity** | | | | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Max allowed end-to-end latency** | **Service bit rate: user-experienced data rate** | **Reliability** | **Message size (byte)** | **# of UEs** | **UE Speed** | **Service Area[21]** |
| Remote control robot | [1-20ms] | 16 kbit/s -2 Mbit/s  (without haptic compression encoding);  0.8 - 200 kbit/s  (with haptic compression encoding) | [99.99%] | 2-8/DoF | - | high-dynamic  (≤ 50 km/h) | ≤ 1 km2 | Haptic feedback |
| [20-100ms] | 16 kbit/s -2 Mbit/s  (without haptic compression encoding);  0.8 - 200 kbit/s  (with haptic compression encoding) | [99.99%] | 2-8/DoF | - | Stationary or Pedestrian | ≤ 1 km2 | Haptic feedback |
| 5 ms | 1-100 Mbit/s | [99.9%] | [1-10] | - | Stationary or Pedestrian | ≤ 1 km2 | Video |
| 5 ms | 5-512 kbit/s | [99.9%] | [50-100] | - | Stationary or Pedestrian | ≤ 1 km2 | Audio |
| 5 ms | < 1Mbit/s | [99.999%] | - | - | Stationary or Pedestrian | ≤ 1 km2 | Sensing information |
|  | | | | | | | | |

[PR 5.2.6-2] The 5G system shall support a mechanism to allow an authorized 3rd party to provide QoS policy for flows of multiple UEs associated with an application. The policy may contain e.g. the expected 5GS handling and the associated triggering event.