**3GPP TSG-SA5 Meeting #143-e *S5-223469***

**e-meeting, 9- 17May 2022**

**Source: Huawei**

**Title: pCR 28.865 Add issue PLC control service assurance**

**Document for: Approval**

**Agenda Item: 6.5.21**

# 1 Decision/action requested

***The group is asked to discuss and approve the proposal.***

# 2 References

[1]  [SP-211442](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3693): "New SID on deterministic communication service assurance"

[2] S5-222745: "draft TR 28.865 Study on deterministic communication service assurance"; v0.1.0

# 3 Rationale

In TS 22.104, some UCs are provided, e.g. periodic communication for video-operated remote control, real-time streaming data transmission (video data) from a mobile robot to the guidance control system.

For video operated remote control services, in which video backhaul and remote control are performed together. Remote control services are mainly characterized by small packet control URLLC services. Typical scenarios include remote control of gantry cranes or bridge cranes in smart ports and remote surgery in smart medical care, wireless external I/O of robots, and differential protection in the smart grid.The downlink control signaling has high requirements on delay and reliability. This type of service features small data packets, low bandwidth requirements, and high latency and reliability requirements.

PLC control communication services have two characteristics: periodic small-packet interaction (such as data packets for control operations) and burst small-packet transmission (such as device alarms). The stability of the interaction delay is an important factor that affects the service quality. The stable receiving of messages is better than the fast receiving of messages but with great jitter, and is less likely to trigger alarms and service interruptions.

This documents provides the characteristics and requirements for the service assurance for PLC control.It is proposed to add issue service assurance for PLC control in draft TR 28.865.

# 4 Detailed proposal

This document proposes the following changes in TR 28.865.

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| **1st Change** |

# 5 Issues and potential solutions

*Editor's note: this clause will contain the key issues and potential solutions for deterministic communication service assurance.* *Relation and potential enhancements to eCOSLA will also be studied for the related key issues.*

## 5.Z Issue #3: Service assurance for PLC control

*Editor's note: this clause will contain the description and potential solutions for the service assurance of PLC control, e.g. service requirements, related measurements and service performance analysis. PLC control is one of the deterministic communication services in cyber-physical control scenarios described in TS 22.104.*

### 5.Z.1 Description

Editor’s note: This clause provides a description of the key issue#3.

In TS 22.104, some UCs are provided, e.g. periodic communication for video-operated remote control, real-time streaming data transmission (video data) from a mobile robot to the guidance control system.

For the use case of video operated remote control services, in which video backhaul and remote control are performed together. Remote control services are mainly characterized by small packet control URLLC services. Typical scenarios include remote control of gantry cranes or bridge cranes in smart ports and remote surgery in smart medical care, wireless external I/O of robots, and differential protection in the smart grid.The downlink control signaling has high requirements on delay and reliability. This type of service features small data packets, low bandwidth requirements, and high latency and reliability requirements. This documents provides the characteristics and requirements for its service assurance.

PLC control communication services have two characteristics: periodic small-packet interaction (such as data packets for control operations) and burst small-packet transmission (such as device alarms). The stability of the interaction delay is an important factor that affects the service quality. The stable receiving of messages is better than the fast receiving of messages but with great jitter, and is less likely to trigger alarms and service interruptions.

The three-layer model of service experience, service quality and network performance for PLC control is depicted in figure 1.



Figure 1： Service requirement modeling of PLC control service

Service experience layer: establishes service experience related indicators for PLC control based on subjective and objective evaluation. Analyzes experience-layer KQIs.

Service quality layer: studies the relation between KQIs and QoS indicators. It describes the impacts of indicators such as delay jitter and burst packet loss ratio etc in different scenarios.

Network capability layer: studies the relation between QoS and air interface bandwidth/delay, radio network performance measurements, and core network bandwidth/delay requirements, core network performance measurements and capacity etc.

The above information is used as the assurance objective of the PLC control service. The deterministic communication service assurance should support network preparation based on the assurance objective. The DCSA MnS producer collects related data, analyzes service experience and network performance, optimizes and verifies deterministic communication service experience, and achieving the SLA assurance objective through the above steps. The DCSA MnS producer may need to collaborate with other related management services, such as performance management, fault management, eMDAS, eCOSLA, and provisioning.

DCSA-REQ-PLC 1: 3GPP management system should provide service assurance capabilities for PLC control services.

DCSA-REQ-PLC 2: 3GPP management system should provide capabilities to enable consumers to monitor the service requirements fulfilment status and the corresponding analysis information for PLC control services.

### 5.Z.2 Potential solutions

#### 5.Z.2.a Potential solution #<a>: <Potential Solution a Title>

##### 5.Z.2.a.1 Introduction

Editor's Note: This clause describes briefly the potential solution for key issue#3 at a high-level.

##### 5.Z.2.a.2 Description

Editor's Note: This clause further details the potential solution and any assumptions made for key issue#3.

### 5.Z.3 Conclusion - Impact on normative work

Editor's Note: This clause provides the conclusion from the aspect of impact on normative work for key issue#3.

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| **End of change** |