**3GPP TSG-SA5 Meeting #142-e *S5-222465rev1***

**e-meeting, 4 - 12 April 2022**

**Source: Huawei**

**Title: pCR TR 28.908 Add key issues of Energy saving AIML management**

**Document for: Approval**

**Agenda Item: 6.5.5**

# 1 Decision/action requested

***In this box give a very clear / short /concise statement of what is wanted.***

# References

[1] SP-211443 New Study on AI/ ML management

[2] 3GPP TR 37.817 Study on enhancement for Data Collection for NR and EN-DC.

[3] 3GPP TR 28.908 Study on Artificial Intelligence / Machine Learning (AI/ML) management

# 3 Rationale

The New Study [1] on AI/ML management proposed to study the AI/ML management capabilities and management services to support/coordinate AI/ML in 5GS (3GPP management system, 5GC and NG-RAN). According to TR 37.817 [2], AI/ML in the RAN may require OAM to support AI/ML capabilities in the RAN, where the RAN capabilities include network energy saving use case. This contribution proposed to add key issue to support energy saving AI/ML capabilities in RAN.

# 4 Detailed proposal

It is proposed to add the following chapter in TR 28.908 [3].

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| --- |
| **1st modified section** |

# X Key Issues and potential solutions

## X.Y Key Issue #X1: AI/ML management support for AI/ML-based network energy saving in gNB

### X.Y.1 Description

As description in clause 5.1 in TR 37.817 [2], AI/ML techniques could be utilized to optimize the energy saving decisions, such as predict the energy efficiency and load state, which can be used to make better decisions on cell activation/deactivation for energy saving so as to keep a balance between system performance and energy efficiency and to reduce the energy consumption.

This key issue studies how to support energy saving AI/ML capabilities in gNB including:

- The location of the AI/ML-based network energy saving training management function for gNB.

- Management Energy Saving AI/ML model including deployment, validation, testing and evaluation.

### X.Y.2 Potential solutions

Potential solution include:

* Potential solutions 1: AI/ML Energy Saving Model training management function is located in RAN domain layer. AI/ML Model Energy Saving inference management function is located in gNB.
* Potential solutions 2: AI/ML Energy Saving Model training management function is located in cross domain layer. AI/ML Model Energy Saving inference function management is located in gNB.
* Potential solutions 3: AI/ML Energy Saving Model training and inference management function is located in RAN domain layer.

## X.Z Key Issue #X2: AI/ML management support for RAN domain Energy saving

### X.Z.1 Description

As description in clause 4.7.3 in TR 28.813 [x], to provide centralized ES for RAN domain area, 3GPP management system performs the functionalities as monitoring, analysis, decision, execution and evaluation. With AI technology, 3GPP management system can provide more efficient ES for RAN domain area while keeping basic KPIs stable for SLA assurance.

This key issue studies how to support energy saving AI/ML capabilities in RAN domain including:

- AI/ML Model Training and AI/ML Model Inference management function are both located in MnS producer of Domain Centralized ES management for RAN domain area.

### X.Z.2 Potential Solution

Potential solution: AI/ML Energy Saving Model training and Inference management function are both located in RAN domain management layer. The MnS producer of RAN Domain ES management can report AI/ML related Model training and inference information to the MnS consuer, such as Model training status etc.