

EMS Replacement Project - OFGEM justification paper	
Name of Scheme/Programme	EMS Replacement
Primary Investment Driver	Asset Health
Scheme reference/mechanism or category	SPNLT2049 Non-Lead Asset – Protection, Control, Telecoms and Metering
Output references/type	NLRT2SP2049
Cost	£ 6.3m
Delivery Year	RIIO ET2
Reporting Table	C0.7Non-load Master / C2.2a Scheme Summary
Outputs included in RIIO T1 Business Plan	Yes

Issue Date	Issue No	Amendment Details
July 2019	Issue 1	First issue of document
December 2019	Issue 2	Cost updated

Table of contents

1	Introduction	3
2	Background Information	3
3	Optioneering	4
4	Detailed analysis	5
4.1	Selected option	5
5	Conclusion.....	6
6	Future Pathways – Net Zero	6
7	Outputs included in RIIO T1 Plans.....	7

1 Introduction

Constant monitoring and control of the SPT Network is essential in the operation of the electrical power network. It is essential to allow the design, connection, control, operation and fault response to enable network management and ensure that there is a secure and reliable electrical supply to all customers.

The Supervisory Control and Data Acquisition (SCADA) system is the means by which every item of plant and the electrical parameters is constantly monitored in real time. It allows remote control of equipment for everyday planned works and gives visibility to network faults as they happen, allowing network management, safety management, risk mitigation and resource response. The particular SCADA systems for electrical network operations are denoted as Electricity Management Systems (EMS).

The SP Transmission network is currently managed using the [REDACTED] SCADA/EMS system which was originally installed in 2006 and refreshed in 2016 to a new [REDACTED] server architecture. This ensured that the software product could be maintained to the correct standards.

[REDACTED] S
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] there is a requirement for SPT to invest in a new SCADA/EMS System to support the business, the ESO and the UK Infrastructure requirements which the current system cannot achieve.

SPT will invest in, install and migrate to a new SCADA/EMS system to allow the continued support and to develop additional functionality towards managing a SMART Grid network.

This justification paper supports the intention for SPT to invest £6.3m over the RIIO T2 period to replace the existing [REDACTED] SCADA/EMS System.

2 Background Information

The primary reason for selecting the [REDACTED] solution in 2006 and for its refresh in 2016 in was the functional requirement for the traditional suite of EMS applications, additional safety management functionality requirements and latterly for a reduced set of power analysis applications.

The original [REDACTED] platform replaced a Ferranti Argus SCADA system installed in the mid-1980s, scanning a population of RTUs using the legacy Ferranti Mk2A protocol. This protocol was delivered on the [REDACTED] platform to allow backwards compatibility with the then installed RTUs and remains in use today for the majority of sites despite the original RTU having since been replaced. These RTUs are considered in the migration strategy to a new EMS.

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Further developments in protocols together with the required changes to aid the transition to Smart Grid operations have all been considered as part of the transition to a single platform for transmission and distribution.

3 Optioneering

The following is a summary of the options considered for this project.

	Option	Status	Reason for rejection
1	Do nothing: Maintain the current [REDACTED] platform and accept the loss of support and no functionality enhancements	Rejected	Rejected on the basis that system and cyber security would be too compromised by this approach. The loss of support would mean that normal cyber security practices could not be deployed while no functionality enhancements would mean that additional Grid operations would not be developed.
2	Technology Hardware Refresh: Replacement of the hardware supporting the current [REDACTED] Platform	Rejected	Rejected on basis that while this would allow the continued operation of [REDACTED]
3	Replace the EMS/SCADA: This option would allow replacement of the EMS platform with a new system. This could also allow potential efficiencies with the Distribution system to be reviewed and considered.	Proposed	This is proposed. There are potential efficiencies in combining the Transmission and Distribution SCADA systems but this needs to be carefully considered for risk and cyber security aspects.

4 Detailed analysis

4.1 Selected option

Option 3 is the replacement of the existing [REDACTED] SCADA EMS system to allow the decommissioning of the [REDACTED] platform. The potential to combine the overall functionality with the Distribution SCADA systems (PowerON) will be explored within the refresh. The combination of systems will avoid the need for the different hardware, servers, support skills and the interface between the SP Transmission and SP Distribution. This will also enable efficiencies to be delivered from the combination of the two systems in areas such as display and database configuration, system support and future developments.

Whilst the SCADA/EMS replacement is being proposed as a single system, there will still be Transmission elements included, especially the requirement for enhanced safety management functionality. This change to a single system would allow the redesign of the current architecture, reducing the number of servers and points of failures. It will also allow for a redesign in the current communications network between SPT and SPD. This system will be more resilient than the existing system, by way of network design. However, there is a review needed on the overall cyber security risk as part of the architectural review to ensure that the single system would not lead to an increased risk of attacks succeeding.

4.1.1 Hardware

It is anticipated that additional hardware will be required to facilitate the transition from the existing system to the new system.

In the longer term, as part of the options for the exact scope of the new SCADA system, it may be possible to have lower costs due to having a smaller overall client and server estate if there is a final move to a single SCADA system.

4.1.2 Software

The software costs will generally increase for the new functionality that can be deployed as part of the increased functionality. However, a single control system may allow for a reduction overall in software costs should the decision be taken to move to a single system.

4.1.3 Labour costs

Labour costs would be incurred to incorporate the transmission displays and database elements into any new SCADA/EMS system.

4.1.4 Risk Reduction

The proposal to replace the existing Transmission SCADA/EMS system reduces the risk of system obsolescence significantly. This has the additional benefit of ensuring that the cyber security risks have reduced significantly compared to operating an obsolete SCADA system.

The decision to replace the existing Transmission and Distribution systems with a new, single control system will be risk assessed at the time with the proposed solution and architecture. Proceeding with a single system is predicated on no increase in risk from current levels.

4.1.5 Design Safety

The SCADA/EMS functionality and technology is a well-known and developed approach which is used extensively in Electrical network operation. The safety logic that can be configured within the system is generally well proven at voltages up to and including 400kV equipment.

The new configuration would be subject to comprehensive testing by Transmission Control Engineers as part of the project delivery.

4.1.6 Supply Security and Outage Minimisation

Deployment is likely to be a parallel build and hence outage requirements will be minimised or avoided.

Comprehensive testing of the new system will ensure standards of supply security and outage incidence and duration will be no less favourable than with the existing system. It is possible that a combined system could offer improvements due to the tighter integration of SPT and SPD networks.

4.1.7 Security

The physical security risk is based on the location of the servers and there is no proposed change in locations.

Replacing the control system will yield an overall improvement in cybersecurity if the new application, operating systems and other third party components remain well supported throughout the lifetime of the system.

4.1.8 Innovation

The replacement system will be based on the most modern SCADA/EMS system with a proven track record.

There are currently a number of modular applications that are of interest to the business that could be applied with in the T2 period.

5 Conclusion

The marketplace development has led to the requirement for the current SPT SCADA/ EMS system to be replaced both from an obsolescence and low carbon network transition view. It is proposed to complete a refresh of the system with consideration to combining this to a single SCADA system for both Transmission and Distribution should the risk assessment provide the necessary confidence.

- Predicted costs: £ 6.3 m
- Timing of investment: 2026
- Declared outputs: N/A

6 Future Pathways – Net Zero

We have reviewed this project against the criteria set out within the business plan guidance and have assessed that it does not prevent achievement of our Net Zero plans or lead to stranded assets.

7 Outputs included in RIIO T1 Plans

The RIIO-T1 business plan proposed a minor hardware refresh followed by an EMS replacement to be completed by the end of RIIO-T1. However, the most effective option was determined to be a greater level of refresh and to defer the replacement to RIIO-T2. The deferral allowed a whole systems approach to be taken by creating a single platform with the distribution system. This will provide benefit in new applications which cross the transmission/distribution boundary such as Active Network Management.