

Building Refurbishment Programme - OFGEM Justification Paper	
Name of Scheme/Programme	Building Refurbishment Programme
Primary Investment Driver	Civil works driven by condition of civil items
Scheme reference/mechanism or category	SPNLT20101
Output references/type	NLRT2SP20101
Cost	£5.25m
Delivery Year	2021-2026
Reporting Table	Tables C0.7, C2.2a AP and C2.2a CI
Outputs included in RIIO T1 Business Plan	No

Issue Date	Issue No	Amendment Details
July 2019	Issue 1	First issue of document
December 2019	Issue 2	Amendments to scope of works, volumes and costs.

Table of contents

1	Introduction	3
2	Background Information	4
3	Optioneering	4
4	Detailed analysis	5
4.1	Overall Strategy.....	5
4.2	Condition Assessment.....	5
4.2.1	Methodology Approach	5
4.2.2	Outputs from Assessment.....	5
4.3	Sustainability.....	6
4.4	Innovation	6
5	Conclusion.....	6
6	Outputs included in RIIO T1 Plans.....	6

1 Introduction

Electronic protection and smart control assets are designed for indoor use and are housed within substation buildings. These assets are susceptible to poor environmental conditions that can reduce performance, cause failures and lead to increased lifecycle costs.

Making sure the substation building environment is dry and controlled stops moisture from entering and maximises the life expectancy of the electrical assets. We control this environment through the building fabric and the heating, lighting, ventilation and air conditioning systems (collectively called the building services systems).

The energy used to operate these building services contributes to the overall losses on the transmission system, which SPT are committed to reducing. Old and/or poor condition building fabric and building services systems means that more energy is consumed in continually providing the required dry and controlled environment.

This paper supports a proposal to undertake the 'do minimum' works to refurbish the building fabric and building services where they have been identified as being in poor condition.

2 Background Information

Substation buildings are classed as non-lead assets and are not within the scope of the NARM mechanism. However, SPT have an asset management system in place to ensure that these assets are inspected, recorded and managed from a risk perspective.

Where buildings and building services systems are in poor condition they consume more energy to provide the required dry and controlled environment and there is a significant risk that the electronic protection and smart control assets will fail due to these poor environmental conditions.

3 Optioneering

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

	Option	Status	Reason for rejection
1	Do Nothing	Rejected	Through our detailed inspection process it has been determined that no intervention will lead to failure of both the electrical assets within the building and the building itself.
2	Replace	Rejected	Construction of new substation buildings outside the normal cycle of switchgear replacement is impractical and uneconomic. Therefore this option was rejected.
3	Refurbishment of buildings and building services.	Proposed	-

4 Detailed analysis

4.1 Overall Strategy

SPT has a strategy with civil assets to visually inspect annually and intervene when asset condition requires. This has been a historical approach as substation buildings have been seen as maintenance free and expected to be replaced in line with the main asset it supports. As the life of the main plant has been extended through evolution in technologies, mid-life interventions and improved maintenance regimes, the required life of the associated buildings also requires to be examined.

As part of the RIIO-T2 submission, SPT undertook condition assessments of 90 sites constructed prior to 2000, to determine the health index of the Civil Assets and to allow the development of a programme to deliver targeted refurbishment of the civil assets either at or approaching end of life, to ensure no in-service failures.

These sites were selected as it was acknowledged that any site constructed post 2000 would use structures that would only just be approaching mid-life at present and as such should not require any interventions at this stage. SPT will continue to develop its proactive programme of civil asset management to ensure that all civil assets are planned for a whole life management. This programme of works will be the first step in a revised asset management policy to ensure life extension of civil assets.

4.2 Condition Assessment

4.2.1 Methodology Approach

A comprehensive programme of civil inspections has been undertaken across the network and it has been identified through these inspections that at a number of sites the substation building fabric and associated building services are in a poor condition. Without intervention these assets will degrade to a point where they cannot be repaired and this will mean the building cannot provide an environment suitable for housing the internally-installed equipment.

4.2.2 Outputs from Assessment

Through this detailed and comprehensive inspection of 90 sites SPT has been able to determine a Health Index for all of the civil assets on each site. These 90 sites cover approximately 21,000 civil assets, each of which has been assigned a Health Index consistent with the standard SPT range of 1 to 5. Health Index 1 is considered to be new or as new and Health Index 5 is end of life.

Through these inspections a number of buildings across these substations have been identified, through the methodology, as being in Health Index 4 or 5. This means that the assets are either at or approaching End of Life and in need of refurbishment within RIIO T2.

The table below provides a breakdown of the volumes associated with these refurbishment works.

Voltage (kV)	No of Building Refurbishments
132	29
275	14
400	5
Total	48

4.3 Sustainability

SPT are committed to reducing losses on the transmission system and reducing our carbon footprint. Remedial works to the building and building services will allow SPT to improve the internal environment within our substation buildings.

4.4 Innovation

Innovation is a key component to deliver developments in all aspects of work. The technology used in the project will be standard with a proven track record and the application adopted in line with industry standards. However SPT will look to combine these individual solutions into an innovative holistic approach to improve the internal environment of the substation buildings. SPT will also use innovative ways of project delivery and installation to deliver this programme of works.

5 Conclusion

The historical approach to substation buildings as assets which are maintenance free and replaced with the associated plant at end of life is no longer a valid investment strategy. This is due to the development of mid-life refurbishments and improved maintenance of the main plant equipment. SPT have undertaken a comprehensive programme of condition inspections to identify which buildings require to be refurbished. This will be the first step in a revised asset management policy to ensure life extension of our buildings.

As part of our goal to decarbonise our network we are proposing to supplement this 'do minimum' Building Refurbishment Programme by undertaking a further programme of works that will allow us to install a holistic refurbishment solution, specifically aimed at creating low energy use substation buildings. SPT are committed to decarbonising our network and reducing energy consumption across our substations form part of this commitment. As part of the commitments in our Environmental Action Plan (Refer to Annex 7) we are proposing to undertake a project 'EAP - Building Energy Reduction Measures' as detailed in our Engineering Justification Paper 'EJP-SPT-SPNLT20142 - EAP - Building Energy Reduction Measures'.

It is anticipated that by undertaking both these programmes of works we will be able to create a number of low energy substation buildings in a cost efficient way.

This proposed programme will undertake the 'do minimum' works at each substation programme to ensure that the life and condition of the buildings is in line with the plant that it is housing.

- Forecast costs: £ 5.25m
- Timing of investment: 2021-2026
- 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.

However it should be noted that the proposals detailed in our Engineering Justification Paper 'EJP-SPT-SPNLT20142 - EAP - Building Energy Reduction Measures' are likely to make more of an impact on our Net Zero plans and this is detailed within this paper.

7 Outputs included in RIIO T1 Plans

N/A