

**OFGEM RIIO T2 justification paper:
Environmental - Refurbishment of Oil Bunding & Drainage
Systems
(SPNLT20102)**

Environmental - Refurbishment of Oil Bunding & Drainage Systems OFGEM Justification Paper	
Name of Scheme/Programme	Environmental - Refurbishment of Oil Bunding and Drainage Systems
Primary Investment Driver	Civil works driven by condition of civil items
Scheme reference/mechanism or category	SPNLT20102
Output references/type	NLRT2SP20102
Cost	£10.38m
Delivery Year	2021-2026
Reporting Table	Tables C0.7 and 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 volumes and costs

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1 Introduction

Civil assets used to support the main electrical equipment are essential to the safe operation of the transmission system. The condition of these assets can have a bearing on the strategy for the management of the electrical assets and long term stewardship of civil assets is a key priority.

Transformer and reactor bunds and their associated oily water drainage systems are associated with oil filled transformers and reactors to ensure there is no impact on the natural environment from our activities.

This paper supports a proposal to undertake a programme of works to replace and refurbish elements of the existing transformer bunds and associated oily water drainage systems where they are in poor condition.

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2 Background Information

Civil assets 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.

Transformer bunds are used to contain water and oil and are generally constructed of concrete or brick with a sump to collect the mix of oil and water. The oily water drainage system consists of:

- A network of drainage pipes which transfer the oily water from the bund sump to an oil interceptor,
- An oil interceptor which separates the oil and water and discharges the water whilst retaining the oil.
- A further network of drainage pipes which take the cleaned water from the oil interceptor and convey it to an outfall. This outfall is generally a watercourse, soakaway or another drainage network.

In Scotland regulations around the storage of oil are covered in the Water Environment (Controlled Activities) (Scotland) Regulations 2011. Following consultation with Scottish Environment Protection Agency (SEPA) it has been agreed that best practice should be followed to avoid impacts on the natural environment from our activities.

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 transformer bunds and associated oily water drainage systems are in a deteriorated condition and do not comply with SEPA best practice. Without intervention these assets will degrade to a point where they cannot be repaired and will fail.

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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 in the service of these assets.
2	Replace	Proposed	<p>Replacement of the transformer bunds was considered however it has been determined that refurbishment of these bunds is the more cost effective solution.</p> <p>Replacement of the oily water drainage system has been considered. Due to the simplistic construction of the oil interceptors these cannot be reused or refurbished and therefore need to be replaced to allow SPT to comply with SEPA guidance.</p>
3	Refurbishment	Proposed	<p>Refurbishment of the transformer bunds has been determined to be the more cost effective solution and this is the solution that SPT are proposing to use.</p> <p>Refurbishment of the oily water drainage systems has been considered but the oil interceptors cannot be refurbished to ensure SPT comply with SEPA guidance.</p>

4 Detailed analysis

4.1 Selected Option

SPT has a strategy with civil assets to visually inspect annually and intervene when asset condition requires. This has been a historic approach as transformer bunds and oily water drainage systems 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 civil assets also requires to be examined.

As part of the RIIO-T2 business planning process, 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 to 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 assets 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 transformer bunds and associated oily water drainage systems are in a poor condition and do not comply with SEPA guidance.

Alongside the asset inspections at each site SPT undertook a desktop review of the environmental sensitivity of each site to allow us to determine our high, medium and low risk sites and prioritise our programme of works.

4.2.2 Outputs from Assessment

Through the 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 transformer bunds and oily water drainage systems across these substations have been identified 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 replacement/refurbishment.

We have co-ordinated these works with our transformer replacement and refurbishment works and following consultation with SEPA it has been proposed that SPT will undertake works within RIIO-T2 on transformer bunds and oily water drainage systems that have a Health Index 4 or 5 and are at substations identified as being of high environmental risk.

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We have developed a programme of works which prioritises substations based on:

- The Health Index of the transformer bunds and oily water drainage systems;
- The environmental risks associated with the substation;
- Alignment with our transformer replacement and refurbishment programmes;

We anticipate that to align with our transformer replacement and refurbishment programmes and due to network constraints this programme of work will continue beyond RIIO-T2.

Without intervention these assets will degrade to a point where they cannot be repaired and will fail, potentially impacting on the natural environment.

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

Voltage (kV)	No of Transformer bunds being refurbished	No of Oil interceptors being replaced	Total No of Sites
132	38	25	21
275	12	9	6
400	3	2	2
Total	53	36	29

4.3 Environment & Sustainability

The SPT sustainability approach is to prioritise reuse, then refurbish and finally replace if there is no other option. The refurbishment of the existing transformer bunds is a sustainable strategy and in the long term will lead to a significant reduction in the volumes of raw materials associated with new concrete. It will also eliminate the need to dispose of the concrete associated with these old bunds to landfill.

4.4 Innovation

Innovation is a key component to deliver developments in all aspects of work. While the technology used in the project will be standard with a proven track record and the application adopted in line with industry standards, SPT will look to use innovative ways of project delivery and installation to deliver this programme of works.

5 Conclusion

The historical approach to civil assets which are assumed to be 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 assets require to be refurbished. This will be the first step in a revised asset management policy to ensure life extension of civil assets.

The proposed solution delivers a programme to ensure that the life and condition of the transformer bunds and associated oily water drainage systems is in line with their associated transformers.

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- Predicted costs: £ 10.38m
- 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.

7 Outputs included in RIIO T1 Plans

None.