

Persistent Organic Pollutants Management Business Plan Justification Paper



**Persistent Organic Pollutants Management
Business Plan Justification Paper**

1 Executive Summary

Our paper A Risk Based Approach to Asset Management¹ sets out our approach to network risk and how we subsequently identify assets that require intervention to limit the rise of the risk over the RIIO-T2 period.

This paper identifies the need for intervention on assets on our network which may contain Polychlorinated Biphenyl (PCBs), a form of Persistent Organic Pollutant. The primary driver for the scheme is compliance with The Persistent Organic Pollutants (Various Amendments) Regulations 2019.

Our Environmental Policy sets out our approach to the management of Persistent Organic Pollutants.

Following a process of optioneering and detailed analysis, as set out in this paper, the proposed scope of works is:

- Replacement of all assets on our network which contain or are suspected to contain more than 50 parts per million of PCB. This includes the replacement of 105 VTs and 60 CTs at 21 sites.

This scheme delivers the following outputs and benefits:

- Compliance with the The Persistent Organic Pollutants (Various Amendments) Regulations 2019.
- A reduction of the risk of pollution from our assets.

The cost to deliver this scheme is £7.32m and the works are planned to be completed within the RIIO-T2 period. To comply with The Persistent Organic Pollutants (Various Amendments) Regulations 2019 this work must be completed by the 31st of December 2025.

The Persistent Organic Pollutants Management scheme is not flagged as eligible for early or late competition due it being under Ofgem's £50m and £100m thresholds respectively.

¹A Risk Based Approach to Asset Management



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Name of Scheme/Programme	Persistent Organic Pollutants Management		
Primary Investment Driver	Environmental		
Scheme reference/ mechanism or category	SHNLT2045		
Output references/type	NLRT2SH2045		
Cost	The cost for the preferred option is £7.32m		
Delivery Year	RIIO-T2 prior to the 31 st of December 2025		
Reporting Table	C2.24 Legal & Safety		
Outputs included in RIIO T1 Business Plan	No		
Spend apportionment	T1	T2	T3
		£7.32m	

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2 Introduction

This Engineering Justification Paper sets out our plans to undertake removal of assets which contain or are suspected to contain more than 50 ppm of PCB by the 31st December 2025 as directed by legislation.

The Engineering Justification Paper is structured as follows:

Section 3: Need

This section provides an explanation of the need for the planned works. It provides evidence of the primary and, where applicable, secondary drivers for undertaking the planned works. Where appropriate it provides background information and/or process outputs that generate or support the need.

Section 4: Optioneering

This section presents all the options considered to address the need that is described in Section 3. Each option considered here is either discounted at this Optioneering stage with supporting reasoning provided or is taken forward for Detailed Analysis in Section 5.

Section 5: Detailed Analysis

This section considers in more detail each of the options taken forward from the Optioneering section. Where appropriate the results of Cost Benefit Analysis are discussed and together with supporting objective and engineering judgement contribute toward the identification of a selected option. The section continues by setting out the costs for the selected option.

Section 6: Conclusion

This section provides summary detail of the selected option. It sets out the scope and outputs, costs and timing of investment and where applicable other key supporting information.

Section 7: Outputs included in RIIO-T1 Business Plan

This section identifies if some or all the outputs were included in the RIIO-T1 Business Plan and provides explanation and justification as to why such outputs are planned to be undertaken in the RIIO-T2 period.

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3 Need

3.1 Background

Polychlorinated Biphenyl (PCBs) have long been recognised as posing a threat to the environment because of their toxicity, persistence and tendency to bioaccumulate (i.e. to build up in the bodies of animals, particularly at the top of the food chain). As a result, their use is controlled by legislation.

The Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (Scotland) Regulations 2000 requires compliance with EC Directive 96/59/EC on the disposal of PCBs and Polychlorinated Terphenyls (PCTs). This Directive required the preparation of inventories, labelling and disposal / treatment of all significant PCB holdings.

The Persistent Organic Pollutants (Various Amendments) Regulations 2019 require compliance with European Union (EU) Regulation 2019/1021 of the European Parliament and the Council of 20th June 2019 on persistent organic pollutants (recast).

The objective of these regulations is to protect human health and the environment from persistent organic pollutants (POPs) by prohibiting, phasing out as soon as possible, or restricting the manufacturing, placing on the market and use of substances subject to the Stockholm Convention on Persistent Organic Pollutants.

EU Regulation 2019/1021, Annex 1, Part A confirms that:

'Member States shall identify and remove from use equipment (e.g. transformers, capacitors or other receptacles containing liquid stocks) containing more than 0,005 % PCBs and volumes greater than 0.05 dm³, as soon as possible but no later than 31 December 2025.'

3.2 Asset Need

Many assets on our network contain insulating oil and a number were manufactured prior to 1987 when the use of PCBs in insulating oils was permitted. It is therefore possible that these assets contain PCBs above the 50ppm threshold where replacement is required.

Oil sampling and testing for PCB content has been carried out on all oil filled equipment where testing is possible. Testing has been completed for all GTs, SGTs and ETs. This testing has shown that none of these plant items contain more than 50ppm of PCB.

It has not been practical to test all oil filled plant manufactured prior to 1987 as some plant items, specifically VTs and CTs do not typically have oil sampling points. It is possible that these assets contain more than 50ppm of PCB.

We have identified 160 oil filled VTs and 81 oil filled CTs at 32 locations on our network which were manufactured prior to 1987 which may therefore contain PCBs. Of these 55 VTs and 21 CTs are expected to be removed as part of other projects before the end of 2025. This leaves 105 VTs and 60



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CTs at 21 locations which may contain PCBs. If non load and load related projects do not proceed, then this work will still need to be undertaken in the RIIO T2 period to meet Regulatory requirements.

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4 Optioneering

This section presents all the options considered to address the “need” that is described in Section 3. Each option considered here is either discounted at this Optioneering stage with supporting reasoning provided or is taken forward for Detailed Analysis in Section 5.

The recommendation from the need, outlined in section 3, means that intervention is required in the RII0-T2 price control period to meet legislation so the “do nothing” option is not valid.

A summary of the options are presented in the table below:

Option	Option Detail	Cost (£m)	Taken forward to Detailed Analysis?
1	Test all pre 1987 assets to confirm PCB content and replace assets containing PCBs.	N/A	No
2	Test a representative sample of pre 1987 assets and replace assets containing PCBs	N/A	No
3	Replace all assets suspected to contain PCBs with conventional technology.	7.32	Yes
4	Replace all assets suspected to contain PCB with Low Power Instrument Transformers	N/A	No

Option 1: Test all pre 1987 assets and replace those containing PCBs

This option is to carry out oil sampling and testing of all pre 1987 assets to determine which assets contain PCBs. Most VTs and CTs do not have oil sampling valves. Without a suitable sampling point removing oil will require a level of dismantling potentially requiring removal from service. There is a risk that the dismantling will lead to leaks or damage rendering the asset unsuitable for continued service even if PCBs are not detected. This option has been discounted due to the lack of suitable test facilities on assets where testing has not already been completed.

NOT PROGRESSED TO DETAILED ANALYSIS

**Persistent Organic Pollutants Management
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This option recognises the difficulties in sampling all assets described in Option 1 and rather than testing all assets, tests a representative sample and uses the information from this sampling to determine asset types which contain PCBs. The assets to be sampled will be removed from service and replaced. There are a large number of asset types of varying ages to be tested with relatively low numbers of each type in service. Testing each VT type and a 3 phase group of CTs (to minimise commissioning effort and outages) would result in approximately 50% of the assets being tested.

This option has been discounted for the following reasons;

- The requirement to test a significant number of assets in the first year of RIIO T2 to allow planning of later years is impractical.
- Only testing one asset of each type is not a large enough sample to give sufficient certainty that the sample is representative of all assets of that type and therefore doesn't ensure all PCB containing assets are removed.

NOT PROGRESSED TO DETAILED ANALYSIS

Option 3: Replace assets with conventional technology

This option involves the replacement of all assets which are suspected to contain PCB where PCB content can't be confirmed due to the lack of suitable sampling facilities on these assets. This will be assets containing insulating oil manufactured prior to 1987.

Assets will be replaced with conventional equipment types and will include replacement of HV and LV connections and recommissioning of protection.

PROGRESS TO DETAILED ANALYSIS

Option 4: Replace assets with low power instrument transformers

This option involves the replacement of all assets which are suspected to contain PCBs where PCB content can't be confirmed due to the lack of suitable sampling facilities on these assets. This will be assets containing insulating oil manufactured prior to 1987.

Assets will be replaced with low power instrument transformers and will include replacement of HV and LV connections, cabling, protection systems and recommissioning of protection. Using low power instrument transformers can offer advantages in a reduction of copper multicore cabling, reduced exposure to high voltages etc. However, when replacing existing VTs and CTs the use of low power instrument transformers will require the replacement of protection relays and the installation of additional communication infrastructure. The advantages low power instrument transformers bring are harder to realise when retrofitting into existing substations where the infrastructure for traditional



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technology has already been installed than is the case for new installations. The plant replacements required to enable the use of low power instrument transformers when replacement of other equipment is not required is deemed excessive and this option has been discounted.

NOT PROGRESSED TO DETAILED ANALYSIS

A summary of the above optioneering is shown in Table 1, below.

	Do Nothing	Option 1 Test all plant Replace as reqd	Option 2 Sample Test Replace as reqd	Option 3 Conventional Replacement	Option 4 Low Power Replacement
Confirmed removal of all PCBs	✗	✓	✗	✓	✓
Compliance with POPs Regulations	✗	✓	✗	✓	✓
Outage Availability	✓	✗	✗	✓	✓
Provide conventional VTs & CTs	✓	✓	✓	✓	✗
Provide low power VTs & CTs	✗	✗	✗	✗	✓

Table 1 - Optioneering Summary



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5 Detailed Analysis

This section considers in more detail each of the options taken forward from the Optioneering section. Where appropriate the results of Cost Benefit Analysis are discussed and together with supporting objective and engineering judgement contribute toward the identification of a selected option. The section continues by setting out the costs for the selected option.

5.1 Option Selection

There is only one technically acceptable solution to address the requirement to meet the change in legislative requirements for to remove all PCB containing plant. This is to replace 105 VTs and 60 CTs at 21 locations prior to the 31st of December 2025 using conventional technology.

5.2 Cost Estimate

The total cost for delivering the scope of works for the proposed solution is £7.32m.

5.3 Stakeholder Engagement

Stakeholder engagement is not applicable as this work is driven by legislation.

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6 Conclusion

This paper identifies the need for intervention on a number of assets suspected to contain PCBs in order to comply with The Persistent Organic Pollutants (Various Amendments) Regulations 2019. The primary driver for the scheme is compliance with revised Regulations.

Three intervention options were identified for this scheme. Of these, one option was taken forward and considered for detailed analysis.

The proposed scope of work selected (Option 3) is:

- Replacement of all assets suspected to contain PCBs with conventional technology VTs and CTs and associated HV and LV connections and protection commissioning. This requires the replacement of 105 VTs and 60 CTs at 21 locations.

The cost to deliver this scheme is £7.32m and the works are planned to be completed within the RIIO-T2 period prior to the deadline of the 31st of December 2025 as required by The Persistent Organic Pollutants (Various Amendments) Regulations 2019.

The Persistent Organic Pollutants Management scheme is not flagged as eligible for early or late competition due it being under Ofgem's £50m and £100m thresholds respectively.



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7 Price Control Deliverables and Ring Fencing

As set out in our Regulatory Framework paper (section 1.12 and Appendix 3) we support a key principle from Citizens Advice – one that guarantees delivery of outcomes equivalent to the funding received - to ensure that RIIO-T2 really deliver for consumers. At the project level this means that if we don't deliver the output, or a materially equivalent outputs, we commit to returning the ex-ante allowance for the output not delivered.

This means that if the funding for Protection Modernisation should be ring-fenced and if it does not go ahead, we will return the allowances of £22.0m in full (minus any justified preconstruction expenditure).

It also means that we commit to delivering the output specified above for the costs of £22.0m. If we do not deliver the output, or a materially equivalent output, we commit to returning a proportion of the ex-ante allowance. The detailed methodology should be decided at when developing the Close Out methodologies but should apply the same principles of uncertainty mechanisms - that any under delivery should be material.

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8 Outputs included in RIIO-T1 Plans

There are no outputs associated with this scheme included in our RIIO-T1 plans.

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9 References

- Regulation (EU) 2019/1021 of the European Parliament and of the Council Of 20 June 2019 on Persistent Organic Pollutants.
- SHE Transmission Environmental Policy

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