



XH and XJ Routes Overhead Line Uprating Works (VSRE) – Project Assessment

7th May 2026

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1. Reference Table

Title section	
Name of scheme	XH and XJ Routes Overhead Line Upgrading Works (VSRE)
RRP References	VSRE (TORI) XH & XJ Routes 400kV OHL / VSRE XH & XJ Routes 400kV Major Refurb (Scheme_C&V_Calc_Load_Actuals) VSRE – Strathaven – Smeaton OHL Conductor Replacement (E1.11 Pipeline Log)
BPDT/scheme reference number	SPT200473
Load Board Reference	VSRE XH & XJ Routes 400kV Major Refurb (20260427_LoadBoard_SPT.xlsx – 12 May 2026 Load Board)
Investment Driver	Reinforcement – Thermal Upgrading and Asset Health
PASE alignment	This project pre-dates PASE, however Ofgem undertook an engineering assessment at MSIP Stage 1 and approved the preferred solution for this project.
Outputs	Replacement of existing OHL conductor on XH and XJ routes with a High Temperature Low Sag (HTLS) conductor system, as part of the major refurbishment of these 400kV OHL routes.
Cost	Total Direct Cost of the project is £ [REDACTED] m (23/24 prices). RIIO-T2 - £ [REDACTED] m RIIO-T3 - £ [REDACTED] m Total Indirect costs - £ [REDACTED] m (incl. £ [REDACTED] m project specific indirect costs) All costs have been converted to 2023/24 prices in line with the RIIO-T3 RRP.
Delivery year	2028
Applicable reporting tables	Last annual reporting: 2024/2025 RIIO-ET2 RRP: Scheme_C&V_Calc_Load_Actuals – Scheme Names containing VSRE, D4.3_CAI (not disaggregated by scheme), E1.11_ET_Pipeline Log Project Name VSRE – Strathaven – Smeaton OHL Conductor Replacement. Quarterly reporting through the Load Board submissions (last update: 20260427_LoadBoard_SPT.xlsx – 12 May 2026 Load Board).
Historic funding actions	This was identified as an Uncertain Non-Load Reopener and PCD scheme proposal in RIIO-T2 under SpC3.29. The scheme received no allowance through this mechanism. It was not taken forward due to engineering reviews related to enhanced rating requirements for the respective (XH & XJ) routes between Strathaven – Wishaw- Smeaton substations. In 2014 the North Circuit of XH Route (Strathaven-Wishaw (11.6 cctkm)) was reconducted with 425mm ² ‘Totara’ AAAC (i.e. modern equivalent asset to 400mm ² ‘Zebra’ ACSR). The replacement of this asset will result in a portion of Early Asset Write Off (EAWO) costs. <ul style="list-style-type: none"> • Net Zero and Re-opener Development Fund: £ [REDACTED] m (RIIO-T2) • Pre-Construction Funding: £8.320m (RIIO-T3) • CAI UIOLI - £ [REDACTED] m (RIIO-T3)
Interactive projects	VSRE is one of SPT’s Clean Power 2030 projects and is essential to realising the system benefits from the portfolio investments.

2. Abbreviations / terminology

Table 2.1 – Abbreviations

Abbreviations	Term
AAAC	All Aluminium Alloy Conductor
AACSR	Aluminium Alloy Conductor Steel Reinforced
ACSR	Aluminium Conductor Steel Reinforced
APM	Advanced procurement mechanism
CAI	Closely associated indirects
CEPR	Contractor Environmental Performance Requirements
CP2030	Clean Power 2030
DWNO	Denny to Wishaw 400kV Reinforcement
EAWO	Early Asset Write Off
EISD	Earliest-in-Service Date
FES	Future Energy Scenario
HND	Holistic Network Design
HTLS	High Temperature Low Sag
LC	Licence Condition
LR	Load related
MOD	Ministry of Defence
MSIP	Medium Sized Investment Project
MW	Megawatt
NOA	Network Options Assessment
OHL	Overhead line
OPGW	Optical Ground Wire
PCD	Price control deliverable
PCF	Pre-construction funding
QCRA	Quantitative Cost Risk Analysis
QSRA	Quantitative Schedule Risk Analysis
RIIO	Revenue = Incentives + Innovation + Outputs
RRP	Regulatory Reporting Pack
SpC	Licence Special Condition
SPT	SP Transmission
VSRE	NOA code for the XH and XJ Routes Overhead Line Uprating Works project
SAP	Senior Authorised Person
CSNP	Centralised Strategic Network Plan
BAFO	Best and Final Offer
BNG	Biodiversity Net Gain
NEC4	New Engineering Contract 4 th edition
EPC	Engineering, Procurement, and Construction
EMV	Expected Monetary Value
TO	Transmission Owner
BSC	Business Support Costs
CCC	The Climate Change Committee (originally named the Committee on Climate Change)
HILP	High Impact Low Likelihood
PMP	Project Management Plan
DEFRA	Department for Environment, Food and Rural Affairs
DAG	Data Assurance Guidance

3.Executive Summary

3.1 Project Background

VSRE is a major reinforcement project in SPT’s CP2030 portfolio, included in the Holistic Network Design (HND). It will replace the existing overhead line (OHL) conductor on the strategic east-west Strathaven – Smeaton (XH and XJ routes) corridor with a High Temperature Low Sag (HTLS) conductor system. This project will facilitate increased power transfer from Scotland to England and will ensure timely modernisation of two strategic 400kV OHL routes.

XH route is a 11.6km 400kV double circuit OHL route which connects SPT’s Strathaven 400kV Substation, southeast of Glasgow, to Wishaw 400kV Substation. XJ route is a 62.1km 400kV double circuit OHL route which connects SPT’s Wishaw 400kV Substation to Smeaton 400kV Substation (via Kaimes). Both routes were constructed predominately in 1960 utilising L2 Type steel lattice towers and comprising a twin Zebra conductor system (and twin Totara on the northern side of XH route only); each of these routes will be replaced with an HTLS conductor (Matthew GAP).

Given the strategic system benefit of this project and being part of the HND (consumer benefit £5.5bn) and Clean Power 2030, it is in consumers interests VSRE project is delivered on time – SPT has proposed on time delivery is incentivised under the Major Project ODI.

3.2 Project Assessment Summary

The project was originally presented to Ofgem in 2023 as an MSIP Stage 1 proposal which provided full justification of the proposed solution; this was approved by Ofgem confirming the project need and selected option. In December 2025 Ofgem’s RIIO-T3 Final Determination confirmed that the project could apply for Project Assessment (PA) in the first Load Re-opener window in May 2026 (under Track 1). SPT has engaged with Ofgem throughout the preparation of this Project Assessment (PA) submission to ensure alignment and to enable Ofgem to conduct an effective assessment.

The project construction has now started [REDACTED] and is due to complete by [REDACTED] (P50 date).

3.3 Procurement and Supply Chain

SPT established a 5-year Strategic Framework for Overhead Line Projects based on an Engineering, Procurement, and Construction (EPC) model, to ensure the supply chain availability in a constrained market. The EPC contractor, [REDACTED] were awarded a contract [REDACTED]

3.4 Project Costs and Requested Allowance

The total **Direct Cost** of the project is £ [REDACTED] m (23/24 prices). The expenditure occurs in both RIIO-T2 (£ [REDACTED] m) and RIIO-T3 (£ [REDACTED] m). The indirect costs are £ [REDACTED] m (these are excluded from the PA funding request; the project specific indirect costs (£ [REDACTED] m) are recovered through the RIIO-T2 Net Zero and Re-Opener Development Fund and RIIO-T3 Pre Construction Funding; the non-project specific indirect costs are to be recovered through the CAI UIOLI pot (RIIO-T3)).

The previous and current allowances are as follows:

- RIIO-T2 Net Zero and Re-Opener Development Fund: £ [REDACTED] m
- RIIO-T3 Pre-Construction Funding: £8.320m
- RIIO-T3 CAI UIOLI: £ [REDACTED] m

The PA request is for: **£142.077m** (RIIO-T3 Load Re-Opener). This figure represents the balance of total project cost of £ [REDACTED] m¹ (incl. Indirect Costs) less available funding.

3.5 Risk

This project is the first significant OHL project in the SPT CP2030 portfolio to begin construction, with key delivery risks for the TO linked to land access, protected invasive species, and weather-related and labour access (for contractor). The risks are being managed through early engagement, proactive environmental planning, and close coordination with the EPC contractor to maintain programme certainty.

The project risks have been assessed via Quantitative Schedule Risk Analysis (QSRA) and Quantitative Cost Risk Analysis (QCRA), to arrive at [REDACTED]

- [REDACTED] Risk Allowance (TO): £ [REDACTED] m (23/24 prices).
- P50 Delivery Date: [REDACTED]?

The recommended COAE threshold is [REDACTED]

As raised to Ofgem on 7th of May and 12th of May, SPT are considering the impact of the geopolitical conflicts on their portfolio, [REDACTED] – we welcome continued engagement with Ofgem on this live issue and how to best manage this risk across the full portfolio.

4. Introduction and Background

SP Transmission (SPT) notified Ofgem regarding its intent to submit a PA request for VSRE in February 2026. The project was included in the SPT's RIIO-T3 Business Plan³ as one of the strategic Clean Power 2030 (CP2030) projects.

¹ Whilst LSpC 3.18 (LRt) stipulates projects <£150m should be funded as direct costs only, the Cost Template requires inclusion of Indirect Costs to provide an overall picture of Contractor and TO costs. This is in accordance with LR guidance, which acknowledges indirect funding through relevant mechanisms. For avoidance of doubt, whilst this submission includes TO CAI costs it **does not** include TO BSC.

² Please see further details on the P50 date in Chapter 5.4.

³ SPT's RIIO-T3 Business Plan 2026 – 2031

This submission complies with the requirements of the SPT Licence: Special Condition 3.18 Load Re-opener and Price Control Deliverable (LRt), Part C, and associated Guidance Document, with the aim to establish:

- a) a Load Re-opener Output;
- b) a delivery date for a Load Re-opener Output;
- c) associated allowances (and inclusion of ODI).

This Load Re-opener Project Assessment application sets out SPT plans to replace the existing overhead line (OHL) conductor on the strategic east-west Strathaven – Smeaton (XH and XJ routes) corridor with a High Temperature Low Sag (HTLS) conductor system.

This is a major CP2030 project in SPT’s portfolio which will facilitate increased power transfer from Scotland to England and will ensure timely modernisation of two strategic 400kV OHL routes. The Climate Change Committee (CCC) recently (February 2026) advised Scottish Government that transmission investment is essential to delivering Net Zero by 2045⁴ and VSRE will contribute to this overarching goal.

4.1 Project Need

The need to replace the conductor system on XH and XJ routes due to asset health⁵, as part of a major overhead line (OHL) refurbishment project, was originally presented to Ofgem as part of the RIIO-T2 business plan as scheme SPNLT20111. The need was accepted at that time by Ofgem.

In the period since the RIIO-T2 business plan was submitted, expected increases in onshore and offshore wind generation, supported by the 2021 and 2022 Future Energy Scenarios (FES), confirmed the need to deliver significant additional transmission capacity between Scotland and England in the period to the end of the current decade and beyond. This necessitated a significant increase in the thermal rating of the 400kV circuits on XH and XJ OHL routes.

To ensure the electricity transmission system enables a timely transition to Net Zero, in line with United Kingdom (UK) and Scottish Government targets of 2050 and 2045 respectively, asset intervention was considered in the context of both current and future system requirements. SPT determined that it was vital that the risk of repeated intervention on strategic routes and assets (and therefore repeated system access for construction purposes) was minimised, in particular, where the need for such intervention within the operational lifetime of the replacement asset may reasonably be foreseen.

Thus, the project evolved into a major refurbishment project, integrating load and non-load related drivers. The project was included as part of the 2021/2022 Electricity System Operator Network Options Assessment (ref NOA7 code VSRE)⁶ and the Holistic Network Design (HND) published in 2022 which recommended strategic onshore network reinforcements in Great Britain to enable the connection of 50GW of offshore wind by 2030.

In January 2023 SPT submitted a Medium Sized Investment Projects (MSIP) Stage 1 Re-opener application to Ofgem, which provided full justification of the proposed solution to

⁴ [Progress in reducing emissions in Scotland - 2025 report to Parliament](#), published: February 2026

⁵ [Excluding the 11.6km Strathaven - Wishaw 400kV circuit on the northern side of XH route.](#)

⁶ [Network Options Assessment 2021/22 Refresh](#)

replace the existing OHL conductor with High Temperature Low Sag (HTLS) conductor. The MSIP Stage 1 application was approved by Ofgem in September 2023, confirming the project need and selected option.

In December 2025 Ofgem’s RIIO-T3 Final Determination confirmed that the project could apply for PA in the first Load Re-opener window in May 2026 (under Track 1). This was indicated to Ofgem during the February 2026 Load Board and in our data submission. Our RIIO-T3 plan, including VSRE, enables the Government’s CP2030 targets⁷.

4.2 Project Scope

4.2.1. Background and Confirmed Scope

In the period since January 2023, there has been no material change in project scope, which remains as described in SPT’s Stage 1 MSIP Re-opener application submission of January 2023. Since then, SPT has continued the development of the VSRE project and has secured the supply chain.

As set out in the MSIP Stage 1 submission (Section 6)⁸, as part of the major refurbishment of the XH and XJ 400kV OHL routes, the existing phase conductor is to be replaced with a twin HTLS conductor system.

The current carrying capability of the replacement conductor system is indicated in Table 4.2.1.1 (detail of the capability of the existing twin ACSR ‘Zebra’ conductor system is provided for comparison purposes). These OHL thermal ratings align the summer post-fault continuous rating of the replacement conductor system with the 4000A continuous rating of the existing 400kV switchgear and primary equipment at Strathaven, Wishaw and Smeaton 400kV Substations.

The replacement conductor system will deliver OHL thermal ratings in excess of the minimum detailed in the Stage 1 MSIP submission.

Table 4.2.1.1 - 400kV Thermal Ratings, per Circuit

400kv Thermal Ratings per Circuit	Twin ACSR ‘Zebra’ 50°C (Existing, for comparison)		Twin HTLS ‘Matthew’ 170°C (Planned Capability)	
	Amps	MVA	Amps	MVA
Winter Pre-Fault	1680	1170	3760	2610
Winter Post-Fault	2010	1390	4480	3100
Spring/Aut. Pre-Fault	1560	1080	3700	2560
Spring/Aut. Post-Fault	1850	1280	4400	3050
Summer Pre-Fault	1340	930	3580	2490
Summer Post-Fault	1600	1110	4280	2960

4.2.2 Scope Overview

XH route is a 11.6km 400kV double circuit OHL route which connects SPT’s Strathaven 400kV Substation, southeast of Glasgow, to Wishaw 400kV Substation. Constructed predominately in 1960 utilising L2 Type steel lattice towers, XH route comprises a twin Zebra

⁷ https://www.spenergynetworks.co.uk/news/pages/riio_t3_mission_focussed_on_clean_power_2030.aspx

⁸ [XH-XJ MSIP Reopener - For Publication.pdf](#)

conductor system on the southern side, and twin Totara conductor system on the northern side.

XJ route is a 62.1km 400kV double circuit OHL route which connects SPT's Wishaw 400kV Substation to Smeaton 400kV Substation (via Kaimes). Constructed predominately in 1960 utilising L2 Type steel lattice towers, XJ route comprises a twin Zebra conductor system.

Each of these routes will be replaced by an HTLS conductor system (twin Matthew GAP, with 170°C rated temperature).

The route of the project is shown in Fig 4.2.2.1 below:

Fig 4.2.2.1 – Route of the VSRE Project



The key advantages identified for the proposed solution are that: it is consistent with the transmission requirements identified via NOA and the HND, delivers a significant incremental thermal capacity not less than 1380MVA⁹ per circuit in respect of the existing sections equipped with a twin Zebra conductor system; and it provides full functionality required to give XH and XJ routes a further 40 years of service without further major intervention.

There have been no changes to the scope of the project since the MSIP Stage 1 approval and it was agreed that a further submission will be made at the right time, once the sufficient cost certainty has been reached.

The construction of the project has now started, with on-site reconductoring works commencing in March 2026¹⁰; these are scheduled to complete in 2027/28 (in the RIIO-T3 period).

The proposed solution for XH and XJ OHL routes will replace the 400mm² ‘Zebra’ Aluminium Conductor Steel Reinforced (ACSR) and 425mm² ‘Totara’ All Aluminium Alloy Conductor (AAAC) (1 x circuit of XH route only) with a HTLS conductor system (Matthew GAP). The current carrying capability of the HTLS conductor system is significantly greater than the existing conductor systems (see further detail below in Chapter 5).

On XH route, the 175mm² ‘Lynx’ ACSR earth wire will be replaced with a 36 fibre, 160mm² ‘Keziah’ equivalent AACSR conductor with an optical fibre incorporated in the earth wire (OPGW). This will provide an improvement in fibre connectivity in this section of the network and allow transfer of communication and protection information.

⁹ Winter Post-Fault Continuous Rating: Twin Zebra ACSR 50oC - 1390MVA, Twin Matthew GZTACSR 170oC - 3100MVA (existing substation equipment having a specified 4000A/ 2770MVA rating).

¹⁰ Enabling works (e.g. access tracks) started [REDACTED]

Tower foundations on both routes will be assessed to identify any structural overloads and address any repair/replacement or upgrade as required.

SPT have **all necessary consents in place** for the VSRE Project. There are **no land purchases** required as the works are along the existing overhead line routes, [REDACTED]

4.3 Stakeholder Engagement and Economic Impacts

SPT has engaged extensively with a range of stakeholders throughout the project development and moving to delivery. This involved political engagement with MPs, MSPs, Councillors, Community Councils, and affected local communities. Likewise, a dedicated environmental team have conducted a full environmental impact assessment and management plan for the project.

As stated above, VSRE is part of SPT's CP2030 portfolio of projects and work is ongoing to maximise efficiencies across the portfolio. A Strategic Framework has been established with appointed suppliers, major engineering companies with strong Scottish and UK presence which will utilise local workforce. SPT are working proactively with these companies to manage resource across all projects to create a longer-term pipeline for contractors while achieving critical path across all projects.

SPT are actively engaging with local communities including through the Principal Contractor, [REDACTED] to identify opportunities for STEM engagement for local schools and colleges. There will be more than 100 operatives on the project who require accommodation and food. Local facilities will be hired for meetings and stakeholder events. As a result, there will be a significant economic benefit to the local communities on the XH - XJ routes.

Independent research from Centre for Energy Policy (CEP) at the University of Strathclyde¹¹ has concluded that investment from our RII0-T3 business Plan could contribute sustained economic benefit to UK GDP of around £2bn per annum, this alongside constraint costs savings results in a saving of £167 per household by 2030. VSRE is a critical enabler of the low-carbon transition and its associated economic benefits including lower energy prices. VSRE will contribute to the overall RII0-T3 delivery from our portfolio of 1,400 direct jobs and 11,000 supply chain jobs.

4.4 Delivery Risks

Key delivery risks¹² for VSRE include:

1. [REDACTED]

[REDACTED]

¹¹ [SP T's RII0-T3 Business Plan – Page 79](#)

¹² [Transmission Owner \(TO\) risks](#)

The project risks are being managed through early engagement, proactive environmental planning, and close coordination with the EPC contractor to maintain programme certainty. All risks are included in the risk register provided in this submission (see Appendix 2.1 (a)). The risks have been assessed via Quantitative Schedule Risk Analysis (QSRA) and Quantitative Cost Risk Analysis (QCRA), which SPT has used in previous projects, such as EGL1 and EGL4. This analysis quantifies risk to arrive at a fair and balanced level of risk for individual projects (described further in section 5.4).

Table 4.4.1 – Top 3 risks for TO & Contractor

TO/Contractor	Risk Title	Risk Description	Cost (23/24) (£m)
TO	[REDACTED]	[REDACTED]	[REDACTED]
TO	[REDACTED]	[REDACTED]	[REDACTED]
TO	[REDACTED]	[REDACTED]	[REDACTED]
TO/Contractor*	Risk Title	Risk Description	Cost (23/24) (£m)
Contractor	[REDACTED]	[REDACTED]	[REDACTED]
Contractor	[REDACTED]	[REDACTED]	[REDACTED]
Contractor	[REDACTED]	[REDACTED]	[REDACTED]

*The Contractor risks are allocated via the contract and are excluded from the project risk allowance.

Close collaboration with [REDACTED] on Risk Management has also been undertaken, [REDACTED]

[REDACTED] These are excluded from the proposed TO risk allowance to ensure there is no double counting. Please refer to Section 8.4 below for further details on risk mitigations.

As raised to Ofgem on 7th of May and 12th of May, SPT are considering the impact of the geopolitical conflicts on their portfolio, [REDACTED]

¹³ Price adjustment for Inflation, linked to labour cost indices.

¹⁴ Clause 60.1(13) is referenced within the NEC4 ECC Option C Contract under the Compensation Events section

_____ – we welcome continued engagement with Ofgem on this live issue and how to best manage this risk across the full portfolio.

4.5 Data Assurance

SPT confirms this PA submission has progressed through internal data assurance and governance process in line with Ofgem’s Data Assurance Guidance (DAG)¹⁵, having obtained Director sign off.

5. Final Cost and Supporting Documents

This section provides an overview of the updated cost estimates for the construction of the project, upon which allowances are sought, explaining the assumptions underpinning the costs and forecast.

The scope of works includes the following:

- Installation of twin Matthew GAP Conductor
- Insulators and fittings
- Replacement of the earthwire on XJ route
- Upgrade of ca. 70 of the 222 Tower Foundations
- Refurbishment of all 888 Muffs
- Installation of access tracks and roads
- Replacement of any corroded steelwork
- Welfare and Site Establishments.

5.1 Summary of Cost Estimate

A summary of the total cost estimate for the project is provided below including a profile of the direct capital expenditure per year and RIIO period.

Table 5.1.1 below summarises the total costs of the project, including the details of the contractor risk pot (which forms part of the contractor EPC costs and is therefore excluded from the TO risk allowance).

The details of the indirect costs are provided as requested by Ofgem for clarity on the total project costs; the indirect costs are excluded from the PA request and will be recovered via the CAI UIOLI pot and the PCF/NetZero and Re-opener Development Fund (see further details in Section 6).

¹⁵ [Data Assurance Guidance](#)

Table 5.1.1 – Project Costs

Cost category	Sub- Cost Category	Total Cost (£m, 23/24 price base)	% of total
Direct Costs			
Total Direct Costs (Excluding risk & BNG)			
Risk	TO ONLY		
	Contractor ONLY		
Environmental Enhancement	Environmental Enhancement (Biodiversity Net Gain and Compensatory Planting)		
Total Direct Project Cost			
Indirect Costs	Project specific indirects		
	Non-project specific CAI		
Total Indirect Costs			
Total Project Cost			100%

*Indirect costs will be recovered via CAI UIOLI.

A full cost breakdown model is provided in Appendix 1.

The incidence of expenditure for the project is shown in Table 5.1.2 below.

Table 5.1.2 – Incidence of Expenditure (Direct costs only)

Total Direct Project Cost per year, £m, 23/24 price base					
VSRE					Total (£m)
	RIIO T2		RIIO T3		

5.2 Detailed Direct Costs

This section provides a detailed breakdown of the direct project costs associated with every sub-cost Category, aggregated against relevant regulatory cost categories.

Table 5.2.0 – Asset Direct Costs Summary

Asset Direct Costs	Project Cost (£m)
TOTAL	

5.2.1 EPC Contractor Costs

The project is largely based on an EPC model with Service Partner [REDACTED]. This contract will be let under [REDACTED]. The procurement strategy is further explained in Section 8.3 below.

The EPC Contractor costs are detailed in the Table 5.2.1 below.

5.3 Cost Maturity

Aligned with the classification outlined within LR guidance¹⁶, the table below includes the assessment of costs' firmness.

Table 5.3.1 – Cost Firmness Assessment

Cost Firmness 23/24 Prices			
Cost	Cost Firmness as per Ofgem classification	Cost (£m)	Cost (%)
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
TOTAL			
TOTAL base direct cost (excl risk & BNG)		[REDACTED]	[REDACTED]

As can be seen in Table 5.3.1 above, [REDACTED] of the total direct project costs are either incurred already or have been contracted, giving high confidence in our cost submission. As stated, the EPC contract is [REDACTED]. The details of this are shown in Table 5.3.2 below:

Table 5.3.2 – [REDACTED]

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

Given that the EPC contractor has already started construction on the project and that there is a detailed contract with full [REDACTED] affording cost efficiency incentives, transparency and collaboration, there is high confidence in the cost submission.

5.4 Project Risk and Contingency

The VSRE risk profile has been developed through multiple and varied risk workshops undertaken internally with the project team and subject matter experts, as well as collaboratively with the EPC Contractor, [REDACTED]. This approach ensures a comprehensive and robust risk profile has been established to inform an evidence-based risk allowance. The process resulted in a detailed risk register, with each risk assessed for probability, cost, and time impacts.

Several dedicated risk assessment workshops were also conducted to further identify potential risks and analyse them in greater depth. These sessions defined the key characteristics of each risk by capturing justification for the assessments and determining the associated probability and cost and time impacts for each scenario.

¹⁶ [Load Re-opener Guidance and Submission Requirements Document](#)

5.4.1 Proposed Risk Allowance

The total Risk Allowance required for the VSRE Project at a [REDACTED] risk value (23/24 prices) is £[REDACTED]m (representing [REDACTED]). This value has been produced from a fully quantified and justified Quantitative Cost Risk Analysis (QCRA) for the OHL works, which are to be carried out along the XH and XJ routes. Further details on the QCRA are provided in Appendix 2.1 (a).

The Risk Allowance Value in 23/24 prices is reflected within Table 5.1.1 (above) and within Table 5.4.1 below. As stated above, the impacts of the geopolitical conflicts are currently being considered and SPT welcomes continued engagement with Ofgem on this live issue.

Table 5.4.1 – Proposed Risk Allowance

Confidence Range	Value (£m), 23/24 prices
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
Proposed Risk Allowance ([REDACTED]) 23/24 prices	[REDACTED]

Table 5.4.2 below provides detailed information on the top project risks by Estimated Monetary Value (EMV)¹⁷ (cost) (with full details included within Appendix 2.1 (a)).

Table 5.4.2 – Top Risks by Cost

Risk Title	Risk Description	EMV ([REDACTED] 23/24) (£m)	Details
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

¹⁷ EMV - Average cost between the three cost estimates times the probability of impact of the threat or opportunity
 SP Transmission | Version 0.1 | 07 May 2026 | VSRE – Project Assessment Submission

ownership of highly volatile and high impact, low probability (HILP) risks meaning a lower COAE % threshold helps provide a fairer and more balanced ownership of risk. This threshold reflects a balanced and proportionate approach, ensuring that the COAE re-opener is only triggered in circumstances where cost impacts are material and genuinely unforeseen, while avoiding unnecessary re-openers for relatively minor cost variations that can reasonably be managed within existing allowances.

5.4.3 Project Schedule and QSRA

The deterministic schedule for the VSRE project indicates an Earliest In-Service Date (EISD) of [REDACTED]. A Quantitative Schedule Risk Analysis was run for the PA assessment as this applies probabilistic ranges to durations, logic, and key risk events, and then runs a Monte Carlo simulation to generate a distribution of possible completion dates. This process provides a more evidence-based view of schedule confidence levels by accounting for known risks, variability, and potential slippage across delivery phases.

SPT has worked closely with the other GB TOs to provide Ofgem aligned TO principles on QSRA (see Appendix 2.1(d)) whilst we await the NESO’s established delivery date methodology as part of the CSNP and engaging with the NESO is ongoing after escalation with Ofgem. We expect this to be complete by 30th October 2026 (following Ofgem’s CSNP Methodology Approval Decision)¹⁹.

The QSRA model indicates that at a P50 confidence level the EISD for VSRE project is [REDACTED]. It is worth noting, that this P50 date has been developed on a project specific basis, as opposed to on a programmatic basis, and assuming system access to be available as required (further detail on methodology in Appendix 2.1 (b)).

Table 5.4.3 – Deterministic EISD and possible EISD at each P20, P50 and P80

Distribution	Date
Deterministic	[REDACTED]
P20	[REDACTED]
P50	[REDACTED]
P80	[REDACTED]

The top five risks by time are described in the Table 5.4.4 below.

Table 5.4.4 – Top Risks by Time

Risk Title	Risk Description	Expected Schedule Value (ESV) ²⁰
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

¹⁹ CSNP Methodology Approval Decision

²⁰ ESV – Average schedule between the three cost estimates times the probability of impact of the threat or opportunity

compare with projects that have been undertaken or are in SPT’s RIIO-T3 Business Plan. These are shown in table 5.5 below:

Table 5.5 – Project Benchmarking

Project	Description	Cost £m/ cct km
This project	XH/XJ 400kV Circuit Refurbishment	█
YK	YK Route 275kV Overhead Line - Major Refurbishment	█
XL	XL 400kV Circuit Refurbishment	█

5.6 Whole-Life Cost Analysis (WLCA) & Cost-Benefit Analysis (CBA)

This section is not required as there have been no major project changes since Ofgem’s approval of the project needs case.²²

6.Regulatory Funding

6.1 Regulatory Allowance

Table 6.1.1 below shows an overview of regulatory funding that has been approved for the scheme to date.

Table 6.1.1 – Regulatory Mechanism Utilisation

Regulatory Mechanism	Total Allowance (23/24 prices)	Total Allowance Utilised (23/24 prices)	Achieved Outcomes
RIIO-T2-RDFt (SpC 3.5)	£ █ m	£ █ m	Surveys, Project Design, Stakeholder engagement
RIIO-T3 – PCF (SpC 3.15)	£8.320m	£8.320m	Surveys, Project design, Stakeholder engagement, Early Enabling Works
RIIO-T3 – CAI UIOLI (SpC 3.13)	£ █ m	£ █ m	Other CAI activities █ █ █

SPT requests that the following allowance is provided through the Load Re-opener to deliver the works described within Section 4. The requested allowance includes only direct costs associated with the project. Table 6.1.2 below details the Total Requested Allowances as part of this PA submission after deducting allowances that have been accounted for in alternative regulatory mechanisms.

²² [XH-XJ MSIP Reopener.pdf](#)

Table 6.1.2 – Total Requested Allowance

Total Project Allowance Requested Per Year, £M, 23/24 Price Base								
PROJECT								TOTAL (£M)
Net Zero and Re-Opener Development Fund			-	-	-	-	-	
PCF	-	-	1.700	1.680	1.660	1.650	1.630	8.320
CAI UIOLI	-	-						
Current Approved Allowance								
VSRE Total Project Cost (incl. Indirects)								
Remaining Funding Request								
SPT SPT-RI-130 XH AND XJ Routes Overhead Line Uprating Works								142.077

*Balancing figures to account for PCF allowances in the Licence

Please note the requested allowance above aligns with both the total project expenditure profile and the profile of the allowances allocated to date. This takes into account the PCF allowance profile included in the Licence

6.2 Project outputs

It is proposed that the associated Price Control Deliverable (PCD) is defined as follows:

Table 6.2.1 – Request

OSR	Scheme Name	Output	Allowance*	Delivery Date
SPT200473	VSRE - XH and XJ Routes Overhead Line Uprating Works	Replacement of existing OHL conductor on XH and XJ routes with a High Temperature Low Sag (HTLS) conductor system, as part of the major refurbishment of these 400kV OHL routes.	£142.077m	

*Allowance only includes Direct project costs.

7. Major Project ODI-F

As described above, VSRE is a major strategic transmission reinforcement project in SPT’s CP2030 portfolio and is essential to realising the system benefits from the CP2030 portfolio investments. Together these reinforcements will enable increased electricity transfer from Scotland to England, playing a key role in delivering Net Zero by 2045.

VSRE was included in the NOA and HND amongst strategic onshore network reinforcements in Great Britain to enable the connection of 50GW of offshore wind by 2030.

This project is the SPT’s first OHL project of this scale in the CP2030 portfolio to begin construction. The project is challenging but its timely delivery will bring clear benefits to consumers and the wider network, therefore it is proposed that VSRE is considered for a Major Projects output delivery incentive (ODI), based on the following factors:

- Consumer Benefit:** VSRE is part of a wider package of system reinforcement to increase the transfer capability across the East West corridor in Scotland, this is part of a wider package of reinforcements to reduce system balancing and constraint costs as part of the HND, the NESO noted the HND GB package would deliver £5.5bn²³ of consumer benefit.
- Strategic Importance:** as per above, VSRE was identified as a strategic reinforcement by the NESO in its NOA and HND publications and CP2030 advice to government. As noted in the introduction, the CCC recently emphasised the importance of transmission investment in delivering Net Zero in their advice to Scottish Government.
- P50 Delivery Date:** SPT has undertaken a robust risk assessment and QSRA modelling for the project and has arrived at the P50 date of [REDACTED]

As part of this PA submission, SPT has evidenced its detailed and robust delivery plans for the project, set out full project costs, including risk allowance, alongside the P50 delivery date methodology (Appendix 2.1 (b)) with agreed TO QSRA principles (Appendix 2.1 (d)).

In Table 8.1, the potential ODI reward and penalty for the VSRE project have been set out. SPT recommends the VSRE project to be the first in its portfolio of RIIO-T3 Load Re-opener projects to have a Major Project ODI attached to it and would welcome further engagement with Ofgem.

Table 8.1 – Major Project ODI-F (Reward and Penalty Calculations)

Target Delivery Date (P50 date)	Current delivery date (deterministic)	Delivery by P50 date	Delivery by current delivery date	Max Penalty
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Refer to Appendix 5 for the Project Delivery Plan and Appendix 2.1 (a), (b), and (c) for further details on the risk register, assumptions and methodology that has fed into the P50 dates for the VSRE project.

²³ <https://www.neso.energy/document/262681/download> Page 126- economic and efficient

8. Deliverability

8.1 Project Milestones

This project was first considered in its current form by SPT in early 2022. To meet CP2030 targets SPT has given consent for the project to proceed at risk without full funding. The status of the project is as follows and key milestones are expanded in Table 8.1.1 below:

- Design – complete
- Material procurement – complete
- Construction – ongoing (The first outage commenced in March 2026).

Table 8.1.1 – Key project milestones

Key Project Milestones	Date	Status
Ofgem Initial / Need Case Submission	Jan-23	Complete
[REDACTED]	[REDACTED]	[REDACTED]
Ofgem Initial / Need Case Approval	Sep-23	Complete
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
Ofgem Full / Final Funding Submission	May-26	This document
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
Ofgem Full / Final Funding Approval	Dec-26	Ongoing
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	Ongoing
Site Closure	[REDACTED]	Not started

As noted above, [REDACTED] is the appointed Service Partner for the VSRE Project, and the following teams have been established:

- [REDACTED]

The organisational structures for the teams are attached in Appendix 3.1 for SPT and Appendix 3.2 for [REDACTED]

These teams will ensure that this project work is delivered safely, and in line with the agreed time, cost and quality commitments whilst ensuring that all stakeholders are fully engaged.

SPT has a proven track record of delivering essential transmission network upgrade projects and will draw upon this knowledge and experience to effectively manage this project.

A fully developed Project Management Plan is being implemented – this is a document that is 55 pages in length and does not meet the limit of 10 pages for an Appendix. An extract of

the plan has been submitted in Appendix 4. Full copies of this plan can be provided if required.

8.2 Programme Schedule

A standard approach has been applied to the planning phase of this project and that will continue for the reporting and the application of processes and controls throughout the project lifecycle.

A detailed copy of the full project programme is attached in Appendix 5. Copies in Primavera P6²⁴ can be provided if required.

8.3 Supply Chain Capacity and Outage Planning

8.3.1 Supply Chain Capacity

SPT operates an Engineering, Procurement, and Construction (EPC) model for 400kV overhead line projects when utilising a HTLS conductor system. This approach is chosen due to the criticality and complexity of the scope of work as it minimises interfaces and assigns responsibility and risk to a single entity for better management. [REDACTED]

[REDACTED]

Given the supply chain constraints, SPT has in parallel worked on a Strategic Framework for Overhead Line Projects, which was concluded in December 2024. The output of that framework is that there are [REDACTED] partners that will undertake projects for SPT. These are as shown below in Table 8.3.1:

²⁴ Standard project planning tool used by SPT.

²⁵ [Contracts, Project Management and Procurement | NEC Contracts](#)

monitored as a Key Performance Indicator (KPI), ensuring accountability and consistent focus on risk reduction across the delivery supply chain.

This structured approach supports early identification of threats, drives clear ownership of mitigation activities, and drives a focus on risk reduction between all stakeholders involved within the VSRE project.

Table 8.4.1: Key Delivery Risks and Mitigations

Risk Title	Risk Description	Probability ²⁶	Mitigation*

* Mitigation actions are reviewed on a monthly basis, so will be subject to change.

²⁶ Shown as percentage as per the itemised Risk Register (Appendix 2.1 (a)).

8.5 Third Party Coordination Arrangements

The key third parties on the project are [REDACTED]

SPT has formally communicated with each of these parties and continue to do so on a regular basis. With [REDACTED] the project activities are commonplace and there have been no issues. The [REDACTED] issues have been fully addressed by the team.

9 Environmental and Stakeholder Impacts

9.1 Environmental Impact

As the XH and XJ routes are being fully refurbished there are environmental impacts that require to be managed. The excavation of foundations, the laying down of access roads and tracks and the movement of people, materials and plant all could impact on the environment. Accordingly, there is a dedicated environmental team who have conducted a full environmental impact assessment and management plan. This aligns with SPT's commitment to the Global aim which is:

"The continuous improvement is our commitment and the environmental excellence our goal"

SPT Environmental Baseline Assessment reference BT3181-1-EP-SPTM-0002 and associated VSRE Environmental Aspect and Impact Register are attached as Appendices 6a and 6b. The Principal Contractor, [REDACTED] has submitted a detailed Environmental Management Plan. At [REDACTED] pages, this exceeds the 10-page limit for in this PA submission. A copy of the full report can be provided on request.

9.2 Sustainability

In line with SP Transmission's RIIO-T3 Environmental Action Plan, this project will embed sustainability across the project lifecycle, including measures to minimise carbon emissions, protect and enhance biodiversity, and apply circular economy principles to reduce waste and improve resource efficiency. Sustainability considerations will be integrated into tendering and procurement activities to support the use of low carbon materials, responsible suppliers, and high environmental performance in delivery.

All contractors will be required to submit a carbon baseline report and agree upon a carbon reduction target for the project. A carbon management plan aligned with PAS2080²⁸ will be developed to track the actions that will be taken to achieve these reductions and ensure that carbon management is considered throughout the development of the project.

SPT will be aiming for 30% of the main used materials to be from recycled sources focusing on steel, concrete and aggregate. For the project, [REDACTED] have committed to [REDACTED]

²⁷ [REDACTED]

²⁸ [PAS 2080:2023 Carbon Management in Infrastructure | BSI](#)

Furthermore, use a lower carbon concrete as standard for projects which will continue to be used for this project.

9.3 Biodiversity Enhancement

SPT is committed to delivering positive outcomes for biodiversity in line with national planning requirements and internal commitments. As part of the RIIO-T3²⁹ business plan SPT has committed to at least 10% of Biodiversity Net Gain (BNG) for those projects, which are subject to planning consent. In addition, SPT has committed to delivering No Net Loss of biodiversity at a minimum for permitted development projects, such as VSRE.

An allowance has been made within the VSRE project plan to address Biodiversity Enhancement requirements (Appendix 7). This will include an off-site scheme with the Scottish Wildlife Trust to restore wetland habitat. SPT will deliver No Net Loss as a minimum on this project. Baseline ecological surveys have been completed for both the VSRE project and the proposed Scottish Wildlife Trust scheme, and the biodiversity assessments are currently being finalised by the project's ecological consultants. In advance of receiving the outcomes from these assessments, a provisional allowance of £ has been included to deliver the bog restoration works in conjunction with Scottish Wildlife Trust to address the biodiversity impacts arising from construction activities, with final measures to be confirmed once the assessment is complete. The costs are indicative at this stage, but they are benchmarked against both the RIIO-T3 BNG³⁰ and the DEFRA Biodiversity Credits value³¹. BNG metrics are expected to demonstrate that Scottish Wildlife Trust's restoration scheme will offset all biodiversity loss from the VSRE project.

The initial outputs from the biodiversity assessment process are described below:

1. The project has applied the mitigation hierarchy, where impacts have first been avoided, unavoidable impacts have been reduced through design wherever practicable, and impacts which cannot be minimised have been identified for off-site compensation.
2. Ecological consultants have undertaken a Phase 1 habitat survey for the project boundary to inform the BNG assessment.
3. The baseline biodiversity value has been established across the project footprint using the SSEN Transmission biodiversity metric adapted for the Scottish context as outlined in our RIIO-T3 Environmental Action Plan³². This also aligns with the DEFRA metric used by NGET, ensuring a TO-wide approach. We will move to using the Scottish Metric that is currently under development by NatureScot when it is released during 2027. The metric uses the post-development habitats to determine the net change in biodiversity.
4. The outputs from the BNG assessment will be used to ensure that off-site compensation is appropriate to the scale and nature of impacts of development.

²⁹ [Environmental Action Plan - RIIO-T3 Business Plan - SP Energy Networks](#)

³⁰ For T3 BNG, estimated costs were 6% of total project costs.

³¹ [Statutory biodiversity credit prices - GOV.UK](#)

³² [Environmental Action Plan - RIIO-T3 Business Plan - SP Energy Networks](#)

5. Off-site biodiversity enhancement will be delivered through funding local habitat creation or enhancement schemes through established partnerships and will follow the “like-for-like” or “like-for-better” principle to ensure that compensation targets habitats of the same or better quality. The selected scheme will deliver sufficient biodiversity units to fully compensate for development impacts, quantified using the same metric applied to the project assessment.
6. Biodiversity enhancements will be secured through delivery agreements and supported by a Biodiversity Enhancement Plan setting out compensation measures, habitat management, and monitoring to ensure intended outcomes are achieved.

The details associated with the survey and the outputs are contained in Appendix 7.

9.4 Stakeholder Engagement

SPT’s Stakeholder Engagement Plan for the XH and XJ route works is closely aligned to the wider Stakeholder Engagement commitments outlined in the RIIO-T3 business plan. It centres around timely engagement with key stakeholders to achieve mutually acceptable outcomes. SPT has a dedicated and highly experienced Stakeholder Team appointed to the project. They ensure that all Stakeholders are fully cognisant of all aspects of the project.

Some of the key Stakeholders activities include:

- Stakeholder briefings to MSP, MP, Councillors, Community Councils along the entire route to introduce the works.
- Press release to announce major work is currently underway and identify ongoing opportunities throughout the project to update communities through media and other social channels as work progresses.
- Keeping residents informed and updated where there is potential for the works to have an impact.
- Community liaison team will work with local communities to identify opportunities to offer assistance such as expert volunteer hours for local charities etc.
- Ongoing engagement with Principal Contractor to identify opportunities for further engagement in local communities.
- STEM engagement and career engagement with local schools & colleges.
- Identifying opportunities for potential roll out of social value projects to benefit communities.

A copy of the Stakeholder Engagement plan is attached as Appendix 8.

9.5 Benefit to Communities

Whilst the project does not qualify for Community Benefit Funding there will be benefits to the communities on the route. There will be positive economic impact to the local communities and businesses along the route in line with normal project delivery (i.e.

accommodation, meeting rooms, sustenance). Any opportunity to create a benefit in kind will also be explored.

10. References

10.1 Associated documents

Reference	Description of Relevance
XH-XJ MSIP Reopener.pdf	The original application to Ofgem as part of MSIP Stage 1 process, which provided full justification of the chosen option for the project. This was approved by Ofgem in September 2023.
NOA	The Electricity System Operator's Network Option Appraisal which included VSRE project as essential for 2027.
HND	As above for NOA.
SPT's RIIO-T3 Business Plan 2026 – 2031	SPT's Business Plan Submission for the RIIO-T3 Price Control.
Progress in reducing emissions in Scotland 2025 report to Parliament	The Climate Change Committee report highlighting the imperative for Scotland to invest in transmission infrastructure.
CSNP Methodology Approval Decision	Publication which sets out Ofgem's decision to approve NESO's CSNP Methodology, subject to two conditions, including development of a process and guidance on Option Delivery Dates.

11. Appendices

Table of Appendices	Description	No of Pages
Appendix 1: VSRE RIIO-3 Reopener Submission Template	Ofgem's Data Template	1
Appendix 2.1 (a): Risk Strategy – VSRE Risk Register	PDF copy of the detailed VSRE Risk Register* (Costs are noted in Nominal Prices). Please also refer to tab F_1 of Appendix 1.	1
Appendix 2.1 (b): Risk Strategy – VSRE QSRA PA Report	QSRA Methodology Report.	7
Appendix 2.1 (c): Risk Strategy – VSRE QCRA Report	QCRA Methodology Report.	4
Appendix 2.1 (d): Risk Strategy – TO Risk Principles	Joint TOs' (SPT, NGET, SSENT) QSRA Methodology Report.	4
Appendix 3.1: Project Team Structures – Project Team (SPT)	SPT Team Structure	1
Appendix 3.2: Project Team Structures – Project Team [REDACTED]	[REDACTED] Team Structure	1

Table of Appendices	Description	No of Pages
Appendix 4: Project Management Plan	Extract from the SPT VSRE Project Management Plan* (PMP)	9
Appendix 5: Project Programme	A copy of the VSRE project programme, extracted from Primavera P6.	10
Appendix 6a: SPT Environmental Baseline Assessment reference BT3181-1-EP-SPTM-0002	Environmental Baseline Assessment for VSRE	10
Appendix 6b: Associated VSRE Environmental Aspect and Impact Register	Copy of the Environmental Aspect and Impact Register.	3
Appendix 7: Biodiversity Net Gain	SPT approach to BNG for VSRE project	2
Appendix 8: Stakeholder Engagement Plan	SPT Stakeholder Engagement Plan for VSRE project	7
Appendix 9: Ofgem Engagement	Summary of bilateral engagement between SPT and Ofgem on this PA	1
Appendix 10: Meeting Load Re-opener Requirements	Summary of compliance with the LR Guidance.	2
Appendix 11: Framework Procurement Strategy	Summary of SPT's Strategic Framework	5

* Full documents can be provided upon request.