Currie 132/33kV GSP

NESO Driven Project EJP
Version: 1.0
11/12/2024

SP Energy Networks
RIIO-T3 Business Plan

Currie 132/33kV GSP			
Name of Scheme	SPT-TOCO-3649 Currie GSP		
Investment Driver	LRE – sole-use Local Enabling (Exit – Sole Use)		
NESO Review	NESO Reviewed: No		
BPDT / Scheme Reference Number	SPT200918		
Outputs	• Transformer (132kV<=90MVA) (2) • Transformer (Civils) (132kV<=90MVA) (2) • Transformer (132kV<=90MVA) (-2) • Substation Cable – (>=3 core per phase <=33kV) (per km) (0.67) • Substation Cable – (>=3 core per phase 33kV) (per km) (0.67) • Switchgear (Other) (2) • Tracks and roads (per km) (1) • Drainage (per m2) (1) • CB (Gas Insulated Busbar) (ID) (<=33kV) (2) • Cable SCADA System (1) • Fault Recorder: End of life replacement (3) • Wound Plant Protection (132kV (2) • Back-up Protection (4) • Automatic Voltage Control (AVC): End of life replacement (2) • Operational Tripping Scheme (OTS) (2) • Substation Control Systems (SCS) (2) • Batteries at 132kV Substations (2) • Other (Direct) (1) • Risk (1)		
Cost	£9.84m (23/24)		
Delivery Year	2030		
Applicable Reporting Tables	BPDT (Section 5.1 Project Meta Data, Section 6.1 Scheme C&V Load Actuals and 11.10 Contractor Indirects)		
Historic Funding Interactions	None		
Interactive Projects	ED2-LRE-SPD-004-CV3-EJP – Currie GSP Fault Level Mitigation (SP Distribution ED2 Works)		
Spend Apportionment	**ET2**	**ET3**	**ET4**
	£0.05m	£9.79m	£0m

1 Table of Contents

1. Executive Summary

This engineering justification paper (EJP) sets out the need case for:

- Replacement of the two existing 132/11kV 30MVA grid transformers at Currie GSP with two 132/33kV 90MVA grid transformers.

The drivers behind this scheme are:

- Increased capacity in Edinburgh area.
- Need to standardise the site with other SPT GSPs

This scheme will enable SP Transmission (SPT) to standardise the equipment at the Currie 132/33kV Grid Supply Point (GSP) site as part of a joint project with SP Distribution (SPD), whilst increasing the capacity of the existing site, located in the Edinburgh area. This project will replace the existing two 132/11kV 30MVA grid transformers at Currie GSP with two 132/33kV 90MVA grid transformers. Two new 33kV circuits will be installed to the PoC with SPD which will be owned by SPT. The capacity uplift provided by installing these new grid transformers will help to support SPD with the forecast increase in demand over the RIIO-T3 period and beyond. It should be noted that the SPD associated works are included within their RIIO-ED2 plan.

The expected project delivery date is October 2030 and the project cost is £9.79m.

This EJP is submitted for Ofgem's assessment of the need and costs of the project for inclusion within the RIIO-T3 baseline allowance.

2. Introduction

This EJP supports the proposal as set out under SPT-TOCO-3649 to replace the current two 30MVA 132/11kV grid transformers at Currie GSP with two 90MVA 132/33kV grid transformers. The purpose of this project is to alleviate high fault levels at the GSP and increase the current capacity to allow for a greater power transfer between transmission and distribution networks in the area. It will also standardise the assets, as 132/11kV transformers are not in standard use within the SPT area. The works are programmed to commence during the RIIO-T2 period and complete in 2030. The SPD works for this project were previously approved as part of SPD's RIIO-ED2 plan, published in December 2021.

The expected increase in the demand from the distribution system in the area and volume of new generation connections, as forecasted in the Future Energy Scenario (FES) and SPD's Distribution Future Energy Scenarios (DFES), will require SPT to deliver a significant capacity increase to support the SPD over the RIIO-T3 period and beyond.

To ensure that lead times for the procurement of equipment for spare parts for the repair of SPT assets are kept to a minimum, it is proposed to standardise the existing Currie GSP site in line with other SPEN GSPs. This will allow SPT to use standard assets which can be more efficiently and economically maintained due to the ready availability of spare parts and shortened lead times with external suppliers.

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

This EJP is submitted for Ofgem's assessment of the need and costs of the project for inclusion within the RIIO-T3 baseline allowance.

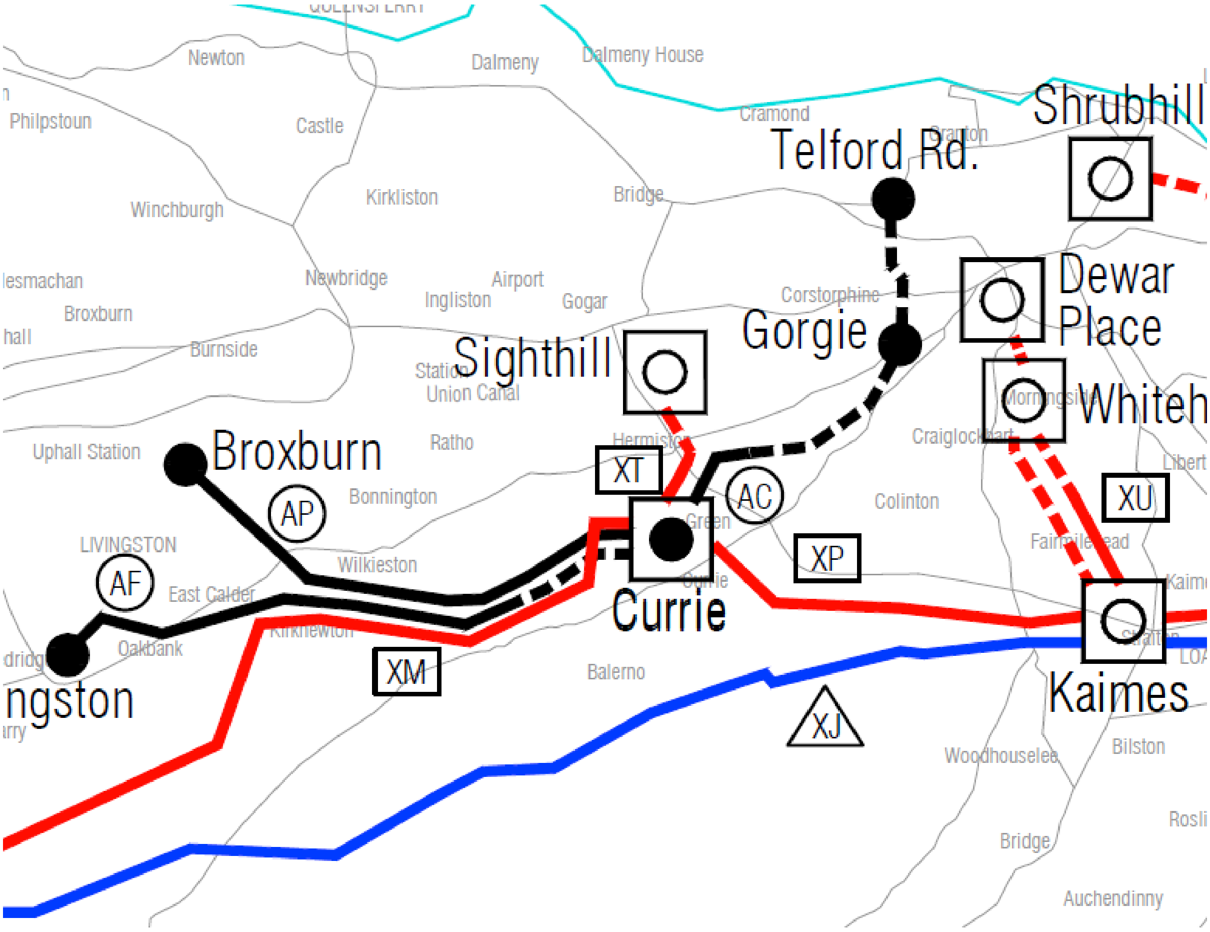


Figure 1: Currie 275/132kV and 132/11kV location from Networks Diagram Geographical Layout

3. Background Information

Currie substation is a strategic transmission substation consisting of Currie 275/132kV Substation and Currie 132/11kV GSP located West of Edinburgh in the East of Scotland. The site at Currie GSP is split into two sections with the SPT plant located to the north of the site and the SPD plant located to the south.

The substation is an integral part of the 275kV and 132kV transmission networks in the East of Scotland. In the 275kV network, the substation is connected to the strategic Kaimes 400/275kV substation via XP route, Sighthill 275kV via XT route and Grangemouth/Kincardine 275kV via XM & XK routes.

The existing SPD plant switchboard consists of 12 panels, 8 of which are feeder breakers, a bus section and two incomer breakers with one spare panel. Currie GSP is fed by two 30MVA 132/11kV transformers, installed in 1967 and feeds the 11kV network in the area via a 11kV underground cable.

Figure 1 provides a geographic indication of Currie GSP in reference to its location in relation to key SPT sites. Existing information on the existing site and potential reinforcement options, which are detailed in section 3, can be found in Table 1 below:

Table 1 Project Design Parameters

System Design Table	**Circuit / Project**	**Option 1 Baseline:** *Do Nothing / Minimum*	**Option 2:** *Establish a new 132/33kV GSP and a 33/11kV Primary Substation (Online Build)*	**Option 3:** *Establish a new 132/33kV GSP and a 33/11kV Primary Substation (Offline Build)*
Thermal and Fault Design	Existing Voltage *(if applicable)*	33/11kV	33/11kV	33/11kV
	New Voltage	132/33kV	132/33kV	132/33kV
	Existing SGT Capacity	30MVA	30MVA	30MVA
	New SGT Capacity	N/A	90MVA	90MVA
	Existing Fault Rating kVA *(if applicable)*	13.1kA (11kV)	13.1kA (11kV)	13.1kA (11kV)
	New Fault Rating KvA	17.5kA (33kV)	17.5kA (33kV)	17.5kA (33kV)
ESO Dispatchable Services	Existing MVAR Rating *(if applicable)*	N/A	N/A	N/A
	New MVAR Rating *(if applicable)*	N/A	N/A	N/A
	Existing GVA Rating *(if applicable)*	N/A	N/A	N/A
	New GVA Rating	N/A	N/A	N/A
System Requirements	Present Demand *(if applicable)*	11MW*	11MW*	11MW*
	2050 Future Demand	18MW*	18MW*	18MW*
	Present Generation *(if applicable)*	0.5MW	0.5MW	0.5MW
	Future Generation Count	N/A	N/A	N/A

	Future Generation Capacity	N/A	N/A	N/A
Initial Design Consideration	Limiting Factor	Thermal and fault level capacity at substation, as well as availability of spare parts for non-standard equipment.	N/A	
	AIS/GIS	N/A	GIS	GIS
	Busbar Design	N/A	N/A	N/A
	Cable/OHL/Mixed	N/A	Cable	Cable
	SI	N/A	Increased (firm) capacity from 30MVA to 90MVA	Increased (firm) capacity from 30MVA to 90MVA

*Based on SPD's DFES

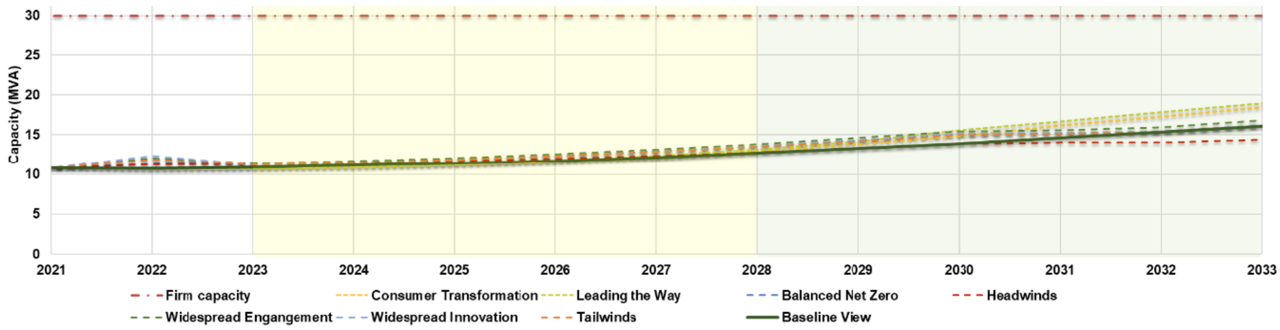
3.1. System Reinforcement Drivers

3.1.1. Currie GSP Generation and Demand

The Distribution Future Energy Scenarios has forecast that the demand at Currie GSP will increase by approximately 50% over the period of RIIO-T3. The below graph, from the accompanying SPD EJP for these works as part of the RIIO-ED2 submission, highlights the increase in demand at Currie GSP across a range of scenarios from the DFES and Climate Change Committee (CCC). The five CCC scenarios are from the CCC 6th carbon budget, which provides advice to the UK government on the approach to the reduction of carbon emissions. These scenarios include:

- Balanced Net Zero
- Headwinds
- Widespread Engagement
- Widespread innovation
- Tailwinds

Further information on these scenarios can be found in the CCC 6th Carbon Budget: Electricity Generation. The Leading the Way and Consumer Transformation scenarios are from the latest DFES[1] (2023).



NESO FES data shows that demand at Currie GSP is forecasted to increase by a factor of 3 over by 2050. This, combined with the DFES data for demand at Currie GSP, highlights the need for SPT to provide the necessary capacity uplift at the site to accommodate this forecasted increase in demand.

NESO's FES show limited increase in generation connections into Currie out to 2050, and the DFES forecast 1.5-3.5MW additional generation connections in the future.

3.1.1. Distribution Fault Level Constraints

There are existing fault level issues at Currie GSP will persist into RIIO-ED2 & RIO-T3, and likely to be exacerbated with the connection of new generation and require operational measures to manage the fault level exceedances. There is around 1.5-3.5MW generation forecasted to be connected to the distribution network at Currie GSP based on DFES. [redacted] The main reason for the high fault level is due to high fault level infeed from the transmission network. Although the 11kV switchgear at Currie is rated at 350MVA, the 11kV network design fault level limit of 250MVA should not be exceeded due to the wider

[1] DFES_SP_Distribution_2023.pdf

impact on downstream equipment and customers (particularly customers connected at 11kV with unknown equipment capability), which will have been designed up to a maximum fault level infeed of no greater than 250MVA.

The current 11kV 3 – phase fault levels (kA) at Currie GSP as a percentage of the lowest design limit of the switchgear is presented in the table below:

Substation Name	Design Rating (kA)		3-phase Fault Levels (kA)		Duty (%)	
	Make	Break	Make	Break	Make	Break
Currie GSP	32.80	13.12	34.41	12.40	104.91%	94.51%

Even though the Peak Make is greater than 100% of design ratings, the switchgear at Currie GSP is rated at 18.4kA RMS Break (350MVA) and 45.9kA Peak Make. Therefore, there is no risk to any internal staff to operate within the Currie GSP switchroom. The fault level "bubble" has also been assessed for the secondary feeder circuits out of Currie GSP, where the fault levels are within design ratings at the closest Secondary S/S. Therefore, the site was deemed not to require any derogation or mitigation.

3.2. NARM Summary

The NARM methodology models the risk associated with the failure of certain lead assets in the network by identifying the asset condition, its probability of material failure and the consequences of the asset failure such as system, environment, safety and financial. The methodology enables the calculation of health and risk bands generated from the assets specific data (age, duty, location, function), the data collected through inspections and any other measured condition.

The NARM metrics are used to provide logical links between asset data held in our Asset Management Systems and the proposed interventions and are a key element of justification to the regulator of investment.

The Health bands, P bands, represent the health of the asset and give an indication of the likelihood of asset failure. The P bands can range from 1-10, being 1 very good health (lowest probability of failure) and 10 poor health-end of the operational life (highest probability of failure).

The Risk bands, R bands, represent a measure of the criticality risk of the asset relative to the rest of the assets of the same type and voltage. There are 10 R bands ranging from 1 to 10, being R1 being lowest criticality risk and 10 highest criticality risk. This metric is useful to prioritise asset interventions within the same asset category (i.e. 132/33kV Transformer) as required.

The assets proposed for intervention under this project have the following risk and health bands:

Table 2: NARM Summary for Currie T1 & T2

Asset	Health Band (P)	Risk Band (R)
Currie T1	P8	R3
Currie T2	P8	R3

The health band of the current transformers at Currie GSP supports the need for intervention on the site in future price control periods. As the site is currently not standard in line with other SPT sites, the time to procure spare parts for the asset could be increased compared to the procurement time to standard sites. The proposed intervention works to replace the 132/11kV transformers with 132/33kV transformers would eliminate this potential lead time for part procurement, if a fault were to occur, and would replace the ageing 132/11kV transformers as they reach the end of service.

4. Optioneering

This section provides a description of each option for Currie GSP and details the key considerations that were taken into account in proposing or discounting each proposal. A summary of each option is described at the start of this section, with the selected option and highlighted and an in-depth review provided. At a high level the options considered were:

Table 3: Options Summary

Options	Map	Layout of Substation/ Connection	Layout of all Route Works	Relevant Survey Works	Narrative Consenting Risks	Narrative Preferred Option	Narrative Rejection
Rejected – Option 1: Do Minimum / Delay		N/A	N/A	N/A	N/A	N/A	A 'Do Nothing' or 'Delay' option is not credible in relation to this project and would not address the fault level issues on the network.
Proposed – Option 2 (Baseline): Establish a new 132/33kV GSP and a 33/11kV primary substation to standardise the configuration of the site (online build)		N/A	N/A	N/A	N/A	Option provides the necessary capacity uplift to ensure SPT can accommodate forecasted increase in generation and demand. Works will standardise the site in line with other SPT GSPs	
Proposed – Option 3: Establish a new 132/33kV GSP and a 33/11kV primary substation to standardise the configuration of the site (offline build)		N/A	N/A	N/A	N/A		Rejected due to the increased capital cost and SPT scope of works

4.1.1. Option 1: Non-Load Intervention Works Only

A 'Non-load intervention works only' option has been considered to represent the ongoing maintenance and repair as part of the business as usual. This option involves the minimum level of intervention that is required to remain compliant with all relevant safety and legal regulations.

This option is not credible in relation to this project and would be inconsistent with SPT's statutory duties and licence obligations, including Licence Conditions D3 and D4A, which require SPT to comply with the NETS SQSS and to offer to enter into an agreement with the system operator upon receipt of an application for connection, such offers being in accordance with the System Operator Transmission Owner Code (STC) and associated Construction Planning Assumptions provided by NGESO.

4.1.2. Option 2: Baseline - Establish a new 132/33kV GSP and a 33/11kV Primary Substation (Online Build)

This solution will aim to standardise the site by establishing a 132/33kV 90MVA Currie GSP on the SPT side with a new indoor 33kV board and a local 33/11kV 20MVA Currie primary substation on the SPD side.

For an online build, the new 132/33kV Grid Transformers would be installed in the same location as the existing 132/11kV GTs and using the same 132kV bays. This would result in the GT being replaced being out of service for the duration of the works, which is envisaged to be a full outage season. From the SPD side, an 11kV interconnection would also be required to facilitate this interconnection and cover an N-1 fault scenario.

4.1.3. Option 3: Establish a new 132/33kV GSP and a 33/11kV Primary Substation (Offline Build)

This option, similar to the Baseline, is to standardise the site by installing two 132/33kV 90MVA transformers at Currie GSP, however in this case an offline build for the GSP would be proposed. However, implementing this solution would incur a significant increase to the project costs for SPT, compared to the previous option 2. This would require the extension of the existing 132kV switchboard, implementation of two new 132kV GIS bays and a new 132kV cable to be laid to the location of the new 132/33kV transformers.

Costs for SPD would also increase due to the increase in New Transmission Capacity Charges (NTCC), however the requirement for an 11kV interconnection would be avoided.

Due to the increased capital costs and scope of works for SPT, this option was not taken forward to full cost assessment.

4.2. Whole Systems Outcomes

It should be noted that our optioneering approach has identified 'Whole System' interactions with other electricity network / system operators (i.e., SP Distribution) in the development of our proposed solution and has considered the appropriate 'Whole System' outcome. This is with consideration that the proposed solution in this EJP, has been developed in conjunction with SPD to ensure the optimal solution is reach for the GB consumer as a whole.

5. Preferred Option

As previously highlighted, the preferred option to provide the most economical and efficient solution to meet all the system requirements is the solution outlined in Section 4 and noted as Option 2. Option 2 presents the solution to replace the two existing 30MVA 132/11kV grid transformers to 90MVA 132/33kV GSPs and the installation of the new 33kV circuit breakers and 33kV cable as transmission works to be carried out by SPT. A 33kV switchboard and two 33/11kV 20MVA transformers to connect to the existing 11kV distribution network will be installed by SPD.

The works carried out by SPT & SPD at Currie GSP as presented in this EJP will provide a solution for the standardisation of the substation in addition to increasing the thermal and fault level capacity at the site. As it stands the fault level at Currie GSP 11kV breakers are currently at 104.91% & 94.51% of the peak make fault levels and RMS break duty of the design fault level limits respectively.

For the preferred option, the installation of the 90MVA 132/33kV grid transformers and associated circuit breakers and disconnectors will reduce the proposed fault levels at Currie GSP to 68.2% & 62.4% of the peak make fault levels and RMS break duty of the design fault level limits of the new 33kV circuit breakers respectively.

The full results of this fault level study, carried out by SPD as part of the RIIO-ED2 submission, are shown below.

Table 4 Fault level results following completion of project

Substation Name	Design Rating (kA)		3-phase Fault Levels (kA)		1-phase Fault Levels (kA)		Max Duty (%)	
	Make	Break	Make	Break	Make	Break	Make	Break
Currie Primary	32.80	13.12	20.68	7.45	22.38	8.19	**68.2%**	**62.4%**
Currie 33kV GSP	50.00	17.50	31.73	11.40	5.89	4.08	**63.5%**	**65.1%**

The increased capacity of the new grid transformers at Currie GSP will also allow SPT to better support forecast increases in demand and future generation connections from the distribution network in the area, and the standardisation of the site will allow for a more efficient procurement process for spare parts for equipment on the site within SPEN due easier access to these assets.

The SPT works for SPT-TOCO-3649 are as follows:

- Install two new 2000A 33kV incomer circuit breakers.
- Install two new 33kV cable circuits from SGT1 and SGT2 to connect the new Currie GSP switchboard (90MVA rating per circuit required to match non-firm capacity of proposed transformers).
- Install two new 132/33kV 90MVA Grid Transformers and associated 132kV cabling.
- Decommission existing 132/11kV Grid Transformers.
- All control and protection works.
- All Environmental and Civil works.

It should be noted that the existing 11kV incoming circuit breakers (owned by SPT) will be retained and transferred to SPD ownership to provide connection from the new 33kV switchboard via SPD owned 33/11kV transformers, as these assets are not currently end of life.

5.1. SPD Works

SPD works will include the establishment of a new indoor switchboard with 13 panels, including two incomers (SPT owned), one bus section and two feeder circuit breakers with space for eight future connections. Two new 33/11kV 20MVA primary transformers will be installed with associated cabling from new GSP switchboard to new Primary Transformers and from new transformers to existing 11kV switchboard. A new suitably rated cable will be installed to facilitate the 11kV network interconnection to ensure demand at Currie is secure under an N-1 scenario. This 11kV interconnection would strengthen the 11kV network to ensure future demand & embedded generation can be connected. These works were submitted as part of the RIIO-ED2 submission and were previously approved.

5.2. Estimated Project Costs

A Business Plan provision and estimated cost of the project is indicated in the following table.

Project costs are summarised in the Cost Breakdown below:

Table 5: Cost Breakdown

[redacted]

Total		**9.84**

Expenditure incidence is summarised below.

Table 6: Direct CAPEX Value

	Potential direct capex value per year, £m, 23/24 price base								
Energisation Year	Yr. 2025: direct capex	Yr. 2026: direct capex	Yr. 2027 (T3): direct capex	Yr. 2028 (T3): direct capex	Yr. 2029 (T3): direct capex	Yr. 2030 (T3): direct capex	Yr. 2031 (T3): direct capex	RIIO-T3 Total: direct capex	Total: direct capex
2030	0.01	0.04	0.08	1.33	3.63	3.88	0.86	9.79	9.84

5.3. Regulatory Outputs

The primary asset outputs are identified in table below.

Table 7: Regulatory Outputs

Asset Sub-Category Primary	Voltage	Intervention	Volume Measure	Units	Volume	[redacted]
Transformer	132kV<=90MVA	Replacement	Addition	Each	2.00	
Transformer	132kV<=90MVA	Replacement	Addition	Each	2.00	
Switchgear - Other	<=33kV	Addition	Addition	Each	2.00	
Substation Cable - >=3 core per phase	<=33kV	Replacement	Addition	km	0.67	
Substation Cable - >=3 core per phase	33kV	Replacement	Addition	km	0.67	
Wound Plant Protection	132kV	Addition	Addition	Each	-6.00	
Tracks and roads	N/A	Addition	Addition	km	1.00	
Drainage	N/A	Addition	Addition	per m2	1.00	
Transformer	132kV<=90MVA	Replacement	Disposal	Each	2.00	
CB (Gas Insulated Busbar) (ID)	<=33kV	Replacement	Addition	Each	2.00	
Cable SCADA System	N/A	Replacement	Addition	Each	1.00	
Fault Recorder: End of life replacement	N/A	Addition	Addition	Each	3.00	
Wound Plant Protection	132kV			Each	2.00	
Back-up Protection	N/A	Replacement	Addition	Each	4.00	
Automatic Voltage Control (AVC): End of life replacement	N/A	Addition	Addition	Each	2.00	
Operational Tripping Scheme (OTS)	N/A			Each	2.00	
Substation Control Systems (SCS)	N/A	Addition	Addition	Each	2.00	

Batteries at 132kV Substations	132kV	Addition	Addition	Each	1.00	[redacted]
Other (Direct)	N/A	N/A	N/A	N/A	1.00	
Risk	N/A	N/A	N/A	N/A	1.00	

6. Deliverability

SPT project management approach has been applied to this project to ensure that this work is delivered safely, and in line with the agreed time, cost and quality commitments. SPT has a proven track record of delivering essential transmission network upgrade projects and will draw upon this knowledge and experience to effectively manage these works. We work closely with our supply chain partners and this relationship is critical to the successful delivery of our plans. Our supply chain provides the support and agility to respond to changes in workload over the course of a price review. Further information Is contained within our Workforce & Supply Chain Resilience Annex. A dedicated Project Manager has been assigned to the works at every stage who is responsible for overall delivery of the scope and is the primary point of contact for all stakeholders. The project manager responsibilities include but are not limited to:

- Handing over the project from development phase and ensuring minimum requirements of the SPT project handover are met
- System and customer updates to reflect transfer of ownership
- Leading tender activities during development phase
- Provision of a comprehensive resource plan to encompass all contractor and SPT operational activities
- Booking outages and risks of trip with operational planning
- Ensure all offline works are completed prior to any outage being taken to reduce system risk
- Co-ordinate all site commissioning issues
- Chair commissioning panel meetings
- Chair progress meetings
- Maintain the site quality plans

In order to complete the proposed works, SPT and SPD will need to work closely to ensure designated works are completed within planned timelines as to minimise potential outage times and waiting periods for works to be completed, potentially delaying the commissioning date. The representative project managers for both SPT & SPD will work diligently to ensure the works are completed in an effective and efficient manner as to minimise required outage times.

Some further responsibilities of the project manager are discussed in the following sub-sections.

6.1. Delivery Schedule (Level 1 Programme)

A standard approach has been applied to the planning phase of these works and that will continue for the reporting and the application of processes and controls throughout the lifecycle. Table 8 below summarises the key milestones within the delivery schedule. Complete detail on the energisation dates and delivery schedules for the proposed scheme can be found in Appendix B.

Table 8: High Level Project Milestones

Item	Project Milestone	Estimated Completion Date
1	Technical Approval	Mar 2024
2	Financial Authorisation Submission (IP1)	Nov 2024
3	SCA Approved	Aug 2025
4	SPEN Development to SPEN Delivery Handoff	Aug 2025
5	Issue of ITT Documents	Jan 2027
5	Final Financial Authorisation (IP2)	Jun 2027
6	Commence Site Works	Dec 2027
7	Complete Site Works	Oct 2030

SP Energy Networks (SPEN) for its procurement process follows a generic global process (INS 00.08.04) for supplier pre-qualification, product technical assessment, manufacturing factory capability assessment and quality audit. The SPEN's equipment approval procedure is to:

- Identify and select candidate equipment
- Ensuring the candidate equipment is assessed to meet the specific requirements of SPEN
- Ensuring a structured and consistent approach is adopted for the approval of candidate equipment prior to energisation
- Ensuring no equipment is installed on SPEN's network without first having been examined in accordance with the procedure and issued a formal internal approval

ASSET-02-002 specifies the SPEN's approval process inclusive of assessment scope and business processes for various equipment.

Regular meetings with the Project and Construction Management Teams shall be undertaken to assess the ongoing effectiveness of the Project Management interfaces.

The Project Manager will facilitate internal Project Team Meetings, in which project progress and deliverables will be reviewed and any arising risks or issues will be discussed and addressed.

6.2. Risk and Mitigation

A Risk Register is generated collaboratively during the initial design stages to identify any risks, which if realised, could result in deviation from the delivery plan. Mitigation strategies are developed to manage the risks identified and these will be implemented by the Project Manager. The risk register shall remain a live document and will be updated regularly. Currently, the top scheme risks are:

- Long lead items (132kV/33kV Transformers & associated 33kV switchgear) addressed through early procurement and ordering.
- Outages on the SPT System. Detailed outage requirements will be identified as part of the detailed engineering design process and discussed and agreed with interested parties.
- Utilities within working areas to be addressed through detailed surveys in advance of works commencing and safe working practices followed for duration of the project.

- Potential risk of Asbestos to be surveyed during the project design phase to allow for mitigation to be arranged.
- Network operability/wayleave/environmental restrictions which impact on the progression of works as planned.

6.3. Quality Management

SPT adopts a "life cycle" approach to Quality Management in major project delivery. Our Management Systems are certified to ISO 9001, ISO 14001 and ISO 45001. Various areas applicable to these standards ensure a quality product is delivered. The significant areas detailed below:

6.3.1. Quality Requirements During Project Development

Any risk or opportunity that may affect the quality of the product are detailed in the Project Risk Register.

The suppliers of main equipment may also receive a Factory Acceptance Test Inspection when the asset is being built.

6.3.2. Quality Requirements in Tenders

Each contract that SPT issues has a standard format. Specifically in relation to quality, this will include a Contractors' Quality Performance Requirement (CQPR). This CQPR represents a specification that details roles and responsibilities for all parties during the works, frequency and format of reporting. It will also specify the document management process to be adhered to during the delivery of the project. In addition to the CQPR, each project has a contract specific Quality Management Plan, detailing the inspection and testing regime for works as well as the records to be maintained.

6.3.3. Monitoring and Measuring During Project Delivery

SPT Projects undertake regular inspections on projects and contractors to monitor and measure compliance with SPT Environmental, Quality and Health and Safety requirements, as detailed in the contract specifications for the work. All inspections are visual, with the person undertaking the inspection ensuring that evidence of the inspection and any actions raised are documented.

The following inspections are completed:

- Quality Inspections (monthly)
- Environmental Inspections (monthly, with weekly review by third party Environmental Clerk of Works)
- Safety Assessments & Contractor Safety Inspection (daily, with full time Site Manager)
- Project Management Tours (monthly)

The scope of audits and Inspections is to determine compliance with:

- Procedures & Guides
- Planned arrangements for ISO 9001, 14001 & 18001
- Legal and other requirements.

6.3.4. Post Energisation

SPT Projects and SPT Operations carry out a Defect Liability Period Inspection within the Contract Defect Liability Period with the aim of identifying any defects and rectifying them with the contractors.

6.4. Environmental and Wayleave Considerations

6.4.1. Environmental Planning

The following highlighted environmental considerations will require to be resolved prior to any work commencing on site:

- Transformer Removal – Oil filled transformers to be removed. Plan to be established for the safe extraction of existing oil.
- Working hours due to location of residential properties to be agreed in advance of works commencing.

The intention should be to use low bearing pressure vehicles where possible. Access routes and formation may be supplementary to existing roads and tracks and should use sustainable materials which can be reutilised where possible. Any compaction of ground should be rectified.

6.4.2. Wayleave Issues

The works are contained within the existing substation boundary and as such no land rights are required.

6.4.3. Environmental Sustainability

IMS-01-001 encompasses all activities undertaken within and in support of SP Energy Networks three Licences. This includes operational and business support functions concerned with management of SP Transmission, SP Distribution and associated regulatory and commercial interfaces, products, services and their associated environmental, social and economic impacts. The policy makes the following commitments which shall be respected in any works associated with this scheme.

SP Energy Networks will incorporate environmental, social and economic issues into our business decision-making processes, ensuring compliance with or improvement upon legislative, industry, regulatory and other compliance obligations. We will deliver this by being innovative and demonstrating leadership on the issues which are important to us and our stakeholders, and will:

- Ensure the reliability and availability of our Transmission and Distribution network whilst creating value and delivering competitiveness by increasing efficiency and minimising losses.
- Reduce greenhouse gas emissions in line with our Net Zero Science Based GHG target, which is a target of 90% reduction in GHG emissions by 2035 (TBC) from a 2018/19 baseline.
- Integrate climate change adaptation requirements into our asset management and operations processes to support business resilience and reduce the length and time of service interruptions.
- Consider whole life cycle impacts to reduce our use of resources to sustainable levels, improve the efficiency of our use of energy and water and aim for zero waste.
- Improve land, air and watercourse quality by preventing pollution and contamination and protecting and enhancing biodiversity in our network areas.
- Improve our service to local communities, supporting their economic and social development, protecting vulnerable customers, and respecting human rights.

7. Conclusion

This EJP demonstrates the need to continue to support the distribution network and mitigate existing high fault levels at Currie GSP by replacing the existing 30MVA 132/11kV GSPs with 90MVA 132/33kV GSPs. These works are programmed to commence in the RIIO-T2 period and complete in 2030, during the RIIO-T3 period.

The installation of the 132/33kV grid transformers by SPT and the installation of a new 33kV switchboard and two 33/11kV 20MVA transformers by SPD, will allow for the standardisation of the site in order to comply with section 9 of the Electricity Act and Condition 21 of SPD's licence obligation. The standardisation of the site will also allow SPEN to better manage the maintenance and repair of equipment at the site due to the ready availability of spare parts for the new rated equipment.

By increasing the current capacity of the grid transformers at Currie GSP from 30MVA to 90MVA, SPT is able to ensure that sufficient support is provided to SPD to accommodate future increases in consumer demand.

The main conclusions of this EJP are:

- The investment in the replacement of the two 132/11kV 30MVA transformers at Currie GSP is required to provide the necessary capacity uplift to support increased demand connections by SPD
- This investment will allow SPT to standardise the Currie GSP site and enable a more economically efficient management of the site
- The expected delivery date for the project is 2030 and the cost is £9.84m.

The ask of Ofgem is for approval of needs and costs detailed within this paper, for inclusion within the SPT RIIO-T3 baseline.

Appendix A – Maps and Diagrams

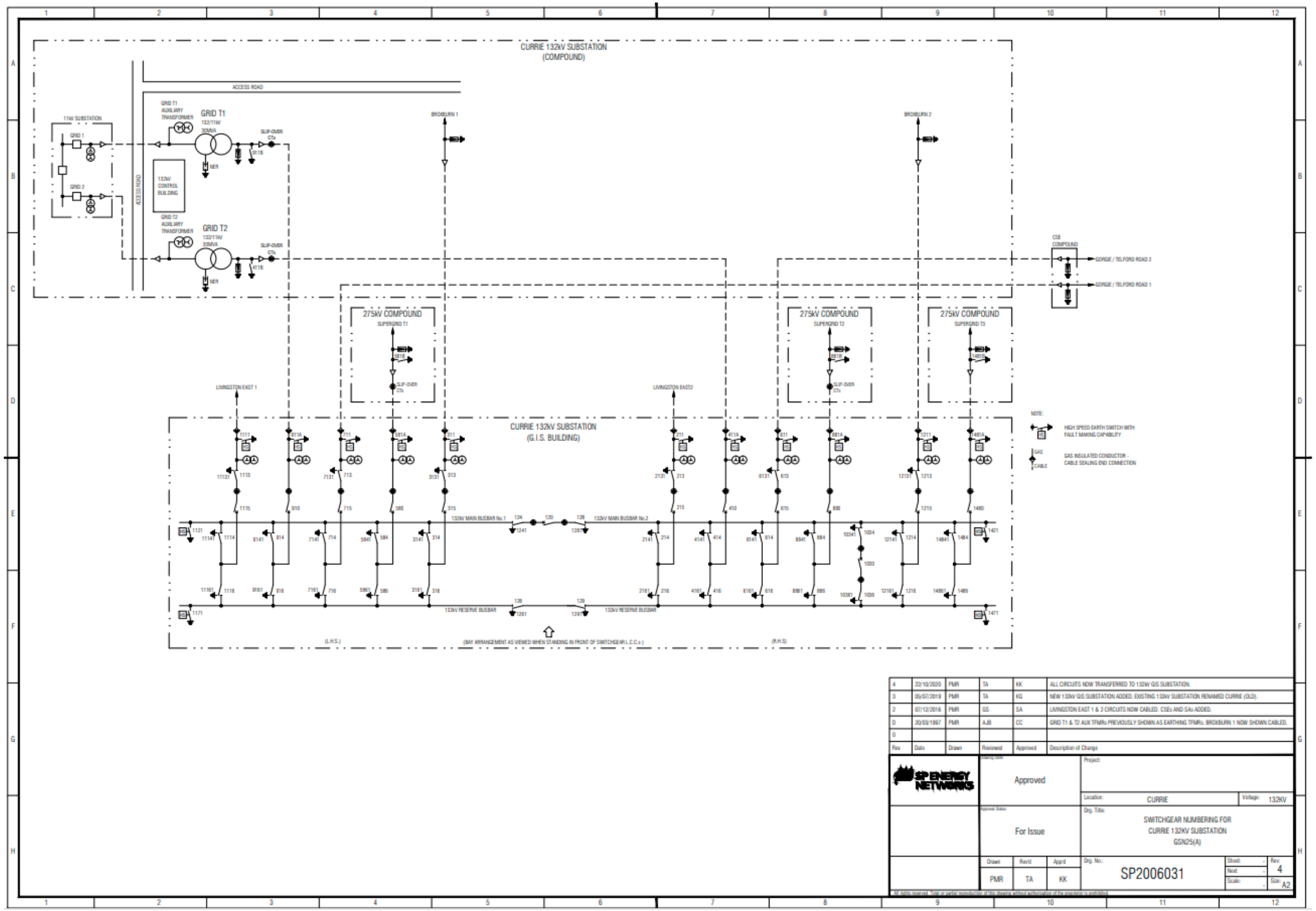


Figure 2 GSN for existing Currie 132kV substation with existing 132/11kV transformers

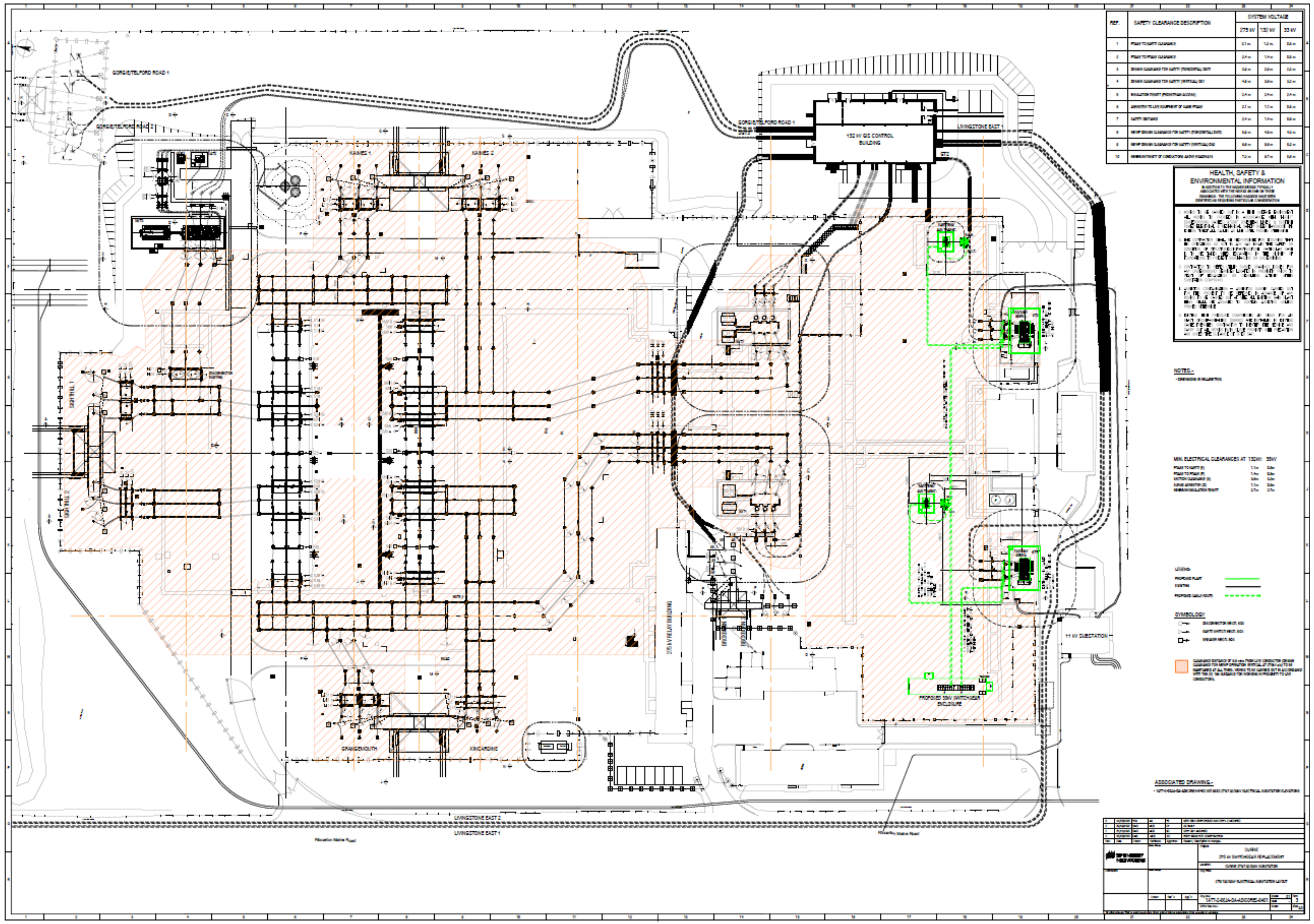


Figure 4 Proposed electrical layout for Option 2