MSIP Re-opener Application Stage 1 – SPT-RI-237 Enoch Hill Collector Substation and Associated 132kV Circuit		
Ofgem Scheme Reference/ Name of Scheme	SPT200312 / SPT-RI-237 – Enoch Hill Collector Substation and Associated 132kV Circuit	
Investment Category	Local Enabling (Entry)	
Primary Investment Driver	Connection of customer-driven onshore wind generation	
Licence Mechanism/ Activity	Special Condition 3.14 Medium Sized Investment Projects Re-opener and Price Control Deliverable/ Clause 3.14.6 (a)	
Materiality Threshold exceeded (£3.5m)	Yes, as a single project due to the threshold for activity 3.14.6 (a)	
PCD primary Output	Generation: (MW) 90MVA	
Total Project Cost (£m)	12.70	
Funding Allowance (£m)	To be confirmed	Requested
Delivery Year	2024/25	
Reporting Table	Annual RRP – PCD Table	
PCD Modification Process	Special Condition 3.14, Appendix 1	

Issue Date	Issue No	Amendment Details
31st January 2023	1	First issue of document.

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1. Abbreviations / Terminology

Table 1: Table of Abbreviations

Abbreviation	Term
ACM	Asbestos Containing Material
AIS	Air Insulated Switchgear
BEIS	Department for Business, Energy & Industrial Strategy
CDM	Construction Design and Management
CEC	Connection Entry Capacity
CION	Connection and Infrastructure Options Note
CT	Current Transformer
ESO	Electricity System Operator
GSP	Grid Supply Point
ITT	Invitation to Tender
Km	Kilometre
kV	Kilovolt
LC	Licence Condition
LSpC	Licence Special Condition
MSIP	Medium Sized Investment Project
MW	Megawatt
NETS SQSS	National Electricity Transmission System Security and Quality of Supply Standard
NGET	National Grid Electricity Transmission
NGESO	National Grid Electricity System Operator
NOA	Network Options Assessment
OHL	Overhead Line
PCD	Price Control Deliverable
PoC	Point of Connection
RIIO	Revenue = Incentives + Innovation + Outputs
SCADA	Supervisory Control and Data Acquisition
SGT	Supergrid Transformer
SHET	Scottish Hydro Electric Transmission
SPT	SP Transmission
SPEN	SP Energy Networks
STC	System Operator – Transmission Owner Code
VDUM	Volume Driver Uncertainty Mechanism
VT	Voltage Transformer

2. Reference Documents

Table 2: Table of Reference Documents

Document Reference	Title
SPEN-RIIO-T2_Business_Plan	SP Energy Networks RIIO T2 Business Plan 2021 - 2026

3. Introduction

This MSIP Re-opener application sets out SPT's plans to establish Enoch Hill 132/33kV Substation within the RIIO-T2 period, comprising: (i) the installation of a new 132kV feeder bay at New Cumnock 132kV Substation; (ii) an approximate 5km 132kV cable circuit from New Cumnock to Enoch Hill; and (iii) the establishment of Enoch Hill 132/33kV Substation, equipped with one 132/33kV 90MVA transformer. These works will enable the connection of 79MW of contracted wind generation.

This MSIP Re-opener application is submitted in accordance with Licence Special Condition (LSpC) 3.14.6 and relates specifically to LSpC 3.14.6 activity (a):

"3.14.6 The licensee may apply to the Authority for a direction amending the outputs, delivery dates or associated allowances in Appendix1 in relation to one or more of the following activities:

(a) a Generation Connection project, including all infrastructure related to that project, the forecast costs of which are at least £4.24m more or less than the level that could be provided for under Special Condition 3.11 (Generation Connections volume driver)"

Applying the RIIO-T2 Generation Connections Volume Driver Uncertainty Mechanism (VDUM) to this project results in the £12.70m estimated total project cost being £7.67m higher than the £5.03m allowance provided by the VDUM. An MSIP Re-opener application is therefore required.

Full justification for the preferred investment option is presented within this MSIP Re-opener application document, together with a detailed description of the proposed solution.

The estimated total project cost may be subject to change. As agreed with Ofgem, a further submission will be made at the right time relating to the associated amendments to the outputs, delivery date and allowances to be detailed as a Price Control Deliverable (PCD) in LSpC 3.14 Appendix 1.

3.1 Structure of Document

This MSIP Re-opener application is structured as follows:

Section 4 – Background and Needs Case

This section outlines the background to the proposed works and details the key project drivers.

Section 5 – Assessment of Options

This section sets out the approach taken to considering the distinct options available to address the need identified in Section 4. The results of an evaluation of the alternative options are presented and the reasoning behind the selection of the preferred investment option is summarised.

Section 6 – Proposed Works

This section provides a description of the proposed solution. It sets out the project scope and other key supporting information.

Section 7 – Project Cost Estimate

This section summarises the estimated cost of the selected option.

Section 8 – Project Delivery

This section outlines the approach which will be taken to deliver the project.

3.2 Requirements Mapping Table

Table 3 maps the requirements set out within Chapter 3 of the RIIO-T2 Re-opener Guidance and Application Requirements Document[1] against specific sections within this document.

Table 3: Requirements Mapping Table

Section	Description	Relevant Section(s) in RIIO-T2 Re-opener Guidance and Application Requirements Document
3	Introduction	3.3, 3.4
4	Background and Needs Case	3.8, 3.9, 3.10, 3.11
5	Assessment of Options	3.13, 3.14, 3.21, 3.22
6	Proposed Works	3.14
7	Project Cost Estimate	3.12, 3.19, 3.20
8	Project Delivery	3.15, 3.16, 3.17

[1] RIIO-2 Re-opener Guidance and Application Requirements Document: Version 2

4. Background and Needs Case

4.1 Statutory and Licence Obligations on SP Transmission plc

SP Transmission plc (SPT) is licenced under section 6(1)(b) of the Electricity Act 1989 ("the 1989 Act") to transmit electricity. The licence is granted subject to certain standard and special conditions. Under section 9(2) of the 1989 Act, SPT is required to fulfil the following duty:-

- *To develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and*
- *To facilitate competition in the supply and generation of electricity*.

This statutory duty is reflected in SPT's transmission licence. In addition, SPT has the following obligations pursuant to its licence conditions (LCs):-

- To at all times have in force a System Operator-Transmission Owner Code (STC) which, amongst other things, provides for the co-ordination of the planning of the transmission system (LC B12);
- To at all times plan and develop its transmission system in accordance with the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS) and in so doing take account of National Grid Electricity System Operator's (NGESO's) obligations to co-ordinate and direct the flow of electricity on, to and over the GB transmission system (LC D3);
- To make available those parts of its transmission system which are intended for the purposes of conveying, or affecting the flow of, electricity so that such parts are capable of doing so and are fit for those purposes (LC D2); and
- To offer to enter into an agreement with the system operator on notification of receipt of an application for connection, or for modification to an existing connection (LC D4A).

Section 38 and Schedule 9 of the 1989 Act also impose duties on SPT when formulating any relevant proposals. In response to statutory and licence obligations upon it, SPT therefore requires to ensure that the transmission system is developed and maintained in an economic, co-ordinated and efficient manner, in the interests of existing and future electricity consumers, balancing technical, economic and environmental factors.

4.2 Key Project Drivers

In June 2019, the UK parliament passed legislation introducing a binding target to reach net zero greenhouse gas emissions by 2050. In Scotland, the Scottish Parliament has committed Scotland to becoming a net-zero society by 2045. The timely connection of low carbon generation, such as onshore wind, will play a vital role in reaching these legislated net zero targets. Further commitments, by the UK Government in October 2021, to decarbonise the power system by 2035, further support the requirement for investment in the existing electricity transmission system to enable the timely connection and integration of the required renewable generation sources. In December 2022 the Scottish Government published its Onshore Wind Policy Statement, setting out its ambition deploy 20GW of onshore wind capacity by 2030.

On 9th September 2021, the Department for Business, Energy & Industrial Strategy (BEIS) announced a £265m[2] budget per year for the Contracts for Difference (CfD) Allocation Round 4, which launched on 13th December 2021 and concluded on 7th July 2022. For the first time since 2015, established technologies, including onshore wind, were able to bid. Given lowering technology costs and a

[2] Biggest ever renewable energy support scheme backed by additional £265 million - GOV.UK (www.gov.uk)

favourable subsidy regime, this will support a considerable number of onshore renewables projects to successfully transition from project inception and development through to energisation[3].

The next CfD auction, Allocation Round 5, is due to open in March 2023, with annual auction rounds expected thereafter.

4.3 Enoch Hill Onshore Wind Farm

Enoch Hill Wind Farm is a proposed onshore wind development by RWE Renewables UK Onshore Wind Limited (RWE), located approximately 6km southwest of the town of New Cumnock and 7km northeast of the town of Dalmellington in the East Ayrshire council area. It is approximately 3.5km east of SPT's existing New Cumnock 275/132kV Substation. The location of the proposed wind farm development is indicated in Figure 1.

Figure 1: Location of Enoch Hill Onshore Wind Farm

The status of the proposed development is summarised as follows:

- A connection agreement is in place for the proposed development, with 69MW Connection Entry Capacity (CEC) and one Point of Connection (PoC) to be located at a new Enoch Hill 132/33kV collector substation.
- The onshore wind farm has secured consent under Section 36 of the Electricity Act for an up to 16 turbine development in September 2019, with this consent being varied December 2021.

Further detail regarding Enoch Hill Wind Farm can be found on the developer's website [4].

[3] BEIS Electricity Generation Costs (2020) - GOV.UK (www.gov.uk)
[4] Enoch Hill Onshore Wind Farm (rwe.com)

4.4 Connection of Enoch Hill Onshore Wind Farm

An application for connection in respect of the proposed 69MW Enoch Hill Wind Farm [redacted]

The onshore wind farm will be connected via the installation of a new 132kV feeder bay at New Cumnock 132kV Substation; (ii) an approximate 5km 132kV circuit from New Cumnock to Enoch Hill; and (iii) the establishment of Enoch Hill 132/33kV Substation, equipped with one 132/33kV 90MVA transformer. The wind farm will be connected via one 33kV point of connection at Enoch Hill 132kV Substation.

At the developer's request, the new 132kV circuit from New Cumnock to Enoch Hill will be delivered via an underground cable as opposed to via an overhead line. The developer will therefore fund the incremental capital cost associated with the underground cable solution as a 'One-Off Cost' (as described in SPT's Statement of the Basis of Transmission Owner Charges[5]).

In the period since the original connection application was received in respect of Enoch Hill Wind Farm, [redacted] the developer submitted a separate connection application in respect of the proposed Monquhill Wind Farm, a 10MW development approximately 7km to the east of Enoch Hill. It is proposed to connect Monquhill Wind Farm to Enoch Hill 132/33kV Substation via a single 33kV circuit. This 33kV circuit will be funded by the developer, and the associated scope of work and cost does not form part of this MSIP Re-Opener application. Enoch Hill 132/33kV Substation, which will be equipped with one 132/33kV 90MVA transformer, will therefore become a collector substation serving two onshore wind farms in the New Cumnock area.

As indicated above, 79MW of renewable generation capacity is currently contracted to connect to Enoch Hill 132/33kV Substation. This generation is summarised in Table 4 below:

Table 4: Contracted Generation

Site	Connection Status	Consent Status	Capacity (MW)
Enoch Hill Wind Farm	Contracted	Consented	69.0
Monquhill Wind Farm	Contracted	Awaiting Consent	10.0
Total Capacity (MW)			**79.0**

A Bilateral Connection Agreement is in place between NGESO and the developer of the sites above in Table 4, with SPT-RI-237 identified as Enabling Works. Corresponding Transmission Owner Construction Agreements are in place between NGESO and SPT.

The establishment of Enoch Hill 132/33kV Substation is necessary to accommodate the 79MW contracted renewable generation capacity (of which 69MW is consented). Discussion of the alternative reinforcement options considered can be found in Sections 5.

[5] SPTransmission_2022-2023_Charging_Statement.pdf (spenergynetworks.co.uk)

4.5 Alignment with RIIO-T2 Strategic Goals

As described in our RIIO-T2 plan[6] for the five-years to the end of March 2026, to mitigate the impacts of climate change and achieve a low-carbon energy system requires a level of focused effort and commitment never seen before. The mass electrification of transport and heat has only started and there is a huge amount required to build on the timely progress already made in the electricity sector.

Energy networks are critical to achieving the wider Net Zero emissions targets and with continued engagement with consumers, network users and our wider stakeholders, we've set a progressive plan in place to facilitate a Net Zero future. Our RIIO-T2 plan sets out four strategic goals – informed by our stakeholder priorities – that will keep us moving towards this sustainable future.

These goals and their alignment with the Enoch Hill collector substation project, are summarised below:

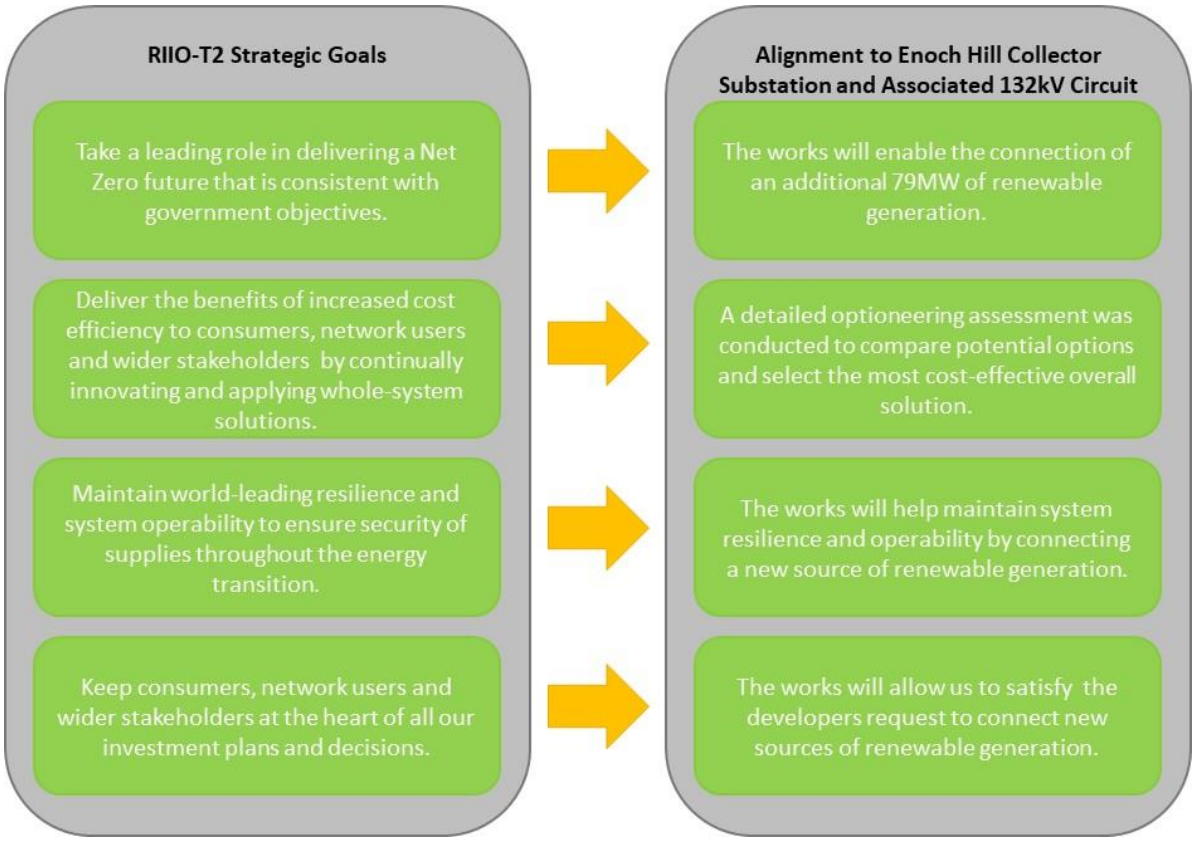

Figure 2: Alignment of the Enoch Hill Collector Substation Proposal with SPT RIIO-T2 Strategic Goals

Further detail regarding how this proposal aligns to our four Strategic Goals is outlined below:

Take a leading role in delivering a Net Zero future that is consistent with government objectives.

Providing the connection to the 69MW Enoch Hill and 10MW Monquhill Wind Farms will increase the amount of renewable generation connected to the GB electricity network and will contribute towards a reduced reliance on fossil fuel electricity generation sources.

[6] SP Energy Networks RIIO-T2 Business Plan

Deliver the benefits of increased cost-efficiency to network users and consumers by continually innovating and applying whole system solutions.

Following receipt of applications for connection, SPT has worked with NGESO throughout the connection offers process to issue connection offers which reflect the most cost-effective connection solutions on a whole systems basis, compliant with the relevant technical standards.

Maintain world-leading resilience and system operability to ensure security of supplies throughout the energy transition.

The establishment of Enoch Hill 132/33kV collector substation will help maintain system resilience and operability by enabling the connection of new sources of renewable generation.

Keep network users and consumers at the heart of all our investment plans and decisions.

The completion of Enoch Hill collector substation will allow SPT to satisfy network users request for connection and is consistent with SPT's statutory and licence responsibilities, including Licence Condition D4A.

Key stakeholders have been consulted during the development of the proposed solution and engagement with stakeholders will continue throughout the project development and delivery process. More detail on stakeholder engagement can be found in Section 8.4.

The completion of the Enoch Hill collector substation and the connection of the associated onshore wind developments will continue to align with our future strategic ambitions.

5. Assessment of Options

Various alternative options were considered to accommodate the additional contracted generation. This included a 'Do Nothing' option.

5.1 Existing System Configuration at New Cumnock 275/132kV Substation

New Cumnock 275/132kV Substation forms part of the Main Interconnected Transmission system (MITS) in south west Scotland, situated to the east of Dalmellington in East Ayrshire.

A geographic overview of the existing SPT system is provided in Appendix A, and an extract from this geographic overview, indicating existing transmission network connectivity in proximity to New Cumnock 275/132kV Substation, is included in Figure 3.

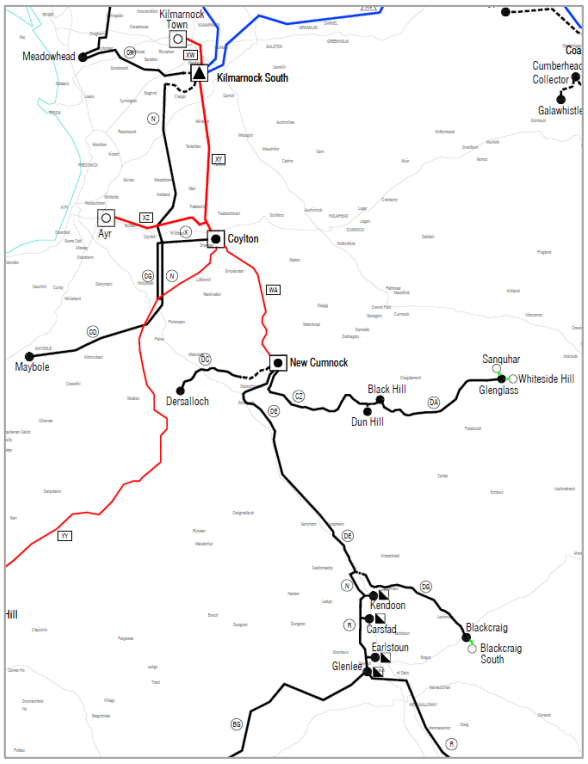

Figure 3: Geographic Indication of New Cumnock 275/132kV Substation

East Ayrshire is an area rich in wind energy resource and New Cumnock 275/132kV Substation serves as a 'collector' site for multiple onshore wind energy developments. These existing developments are connected via the remote Blackcraig, Dersalloch, Dun Hill, Black Hill and Glenglass 132kV Substations, as well as local to New Cumnock e.g. South Kyle Wind Farm.

New Cumnock 275/132kV Substation utilises Air Insulated Switchgear (AIS) with 275kV equipment in a single busbar configuration and 132kV equipment on 'Board A' in a double busbar configuration.

As detailed Figure 4, New Cumnock 275kV Substation connects the following circuits:-

- Coylton No.1 275kV
- Coylton No.2 275kV
- SGT1A, SGT2A and SGT3A, each a 275/132kV 240 MVA unit
- SGT1B and SGT3B, each a 275/132kV 240 MVA unit

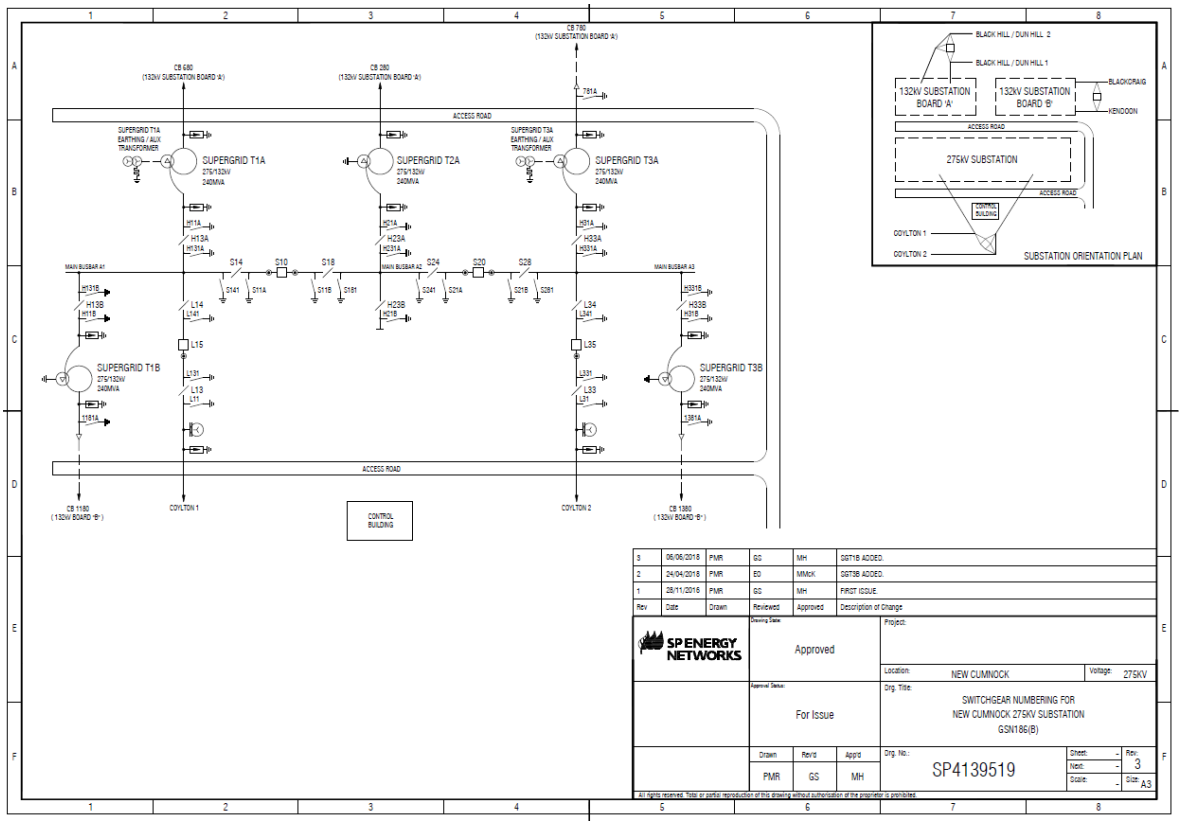

Figure 4: Existing Configuration – New Cumnock 275kV Substation

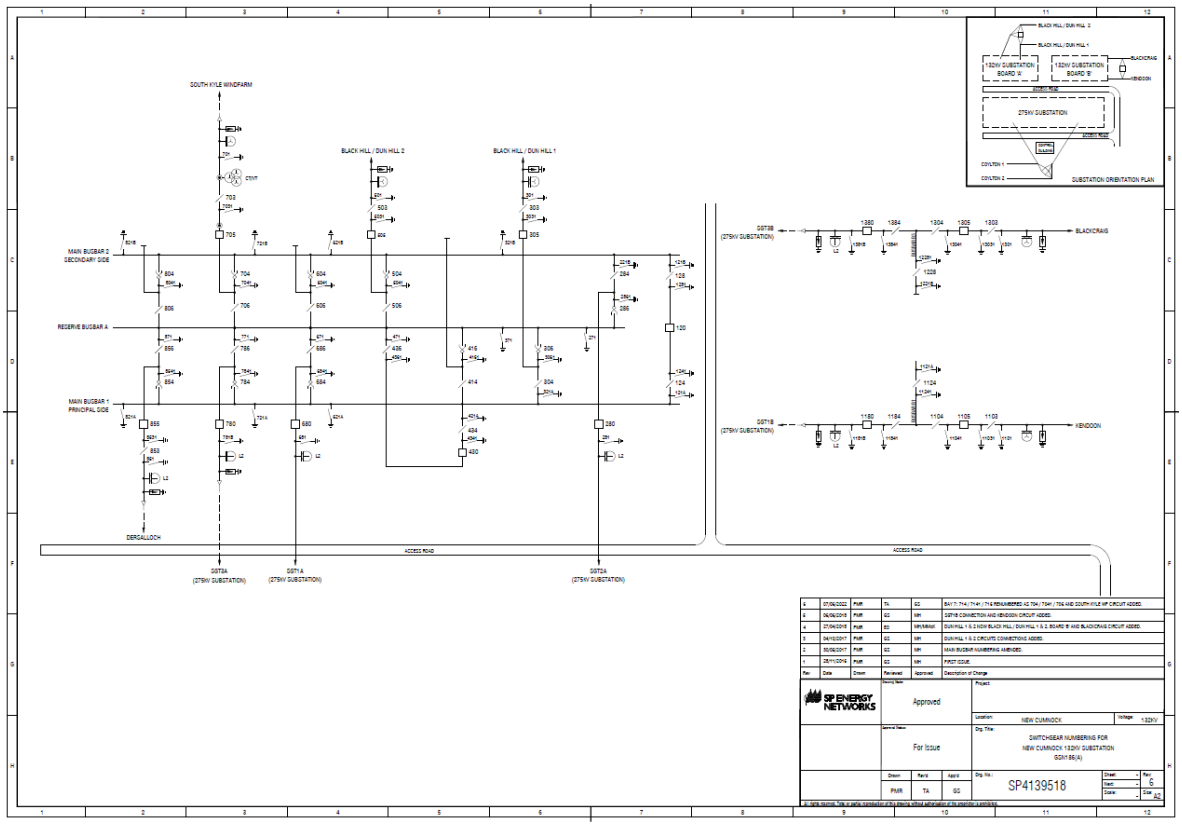

Figure 5: Existing Configuration – New Cumnock 132kV Substation

As detailed Figure 5, New Cumnock 132kV Substation 'Board A' connects the following circuits:-

- Dun Hill/ Black Hill No.1 132kV
- Dun Hill/ Black Hill No.2 132kV
- Dersalloch 132kV
- SGT1A, SGT2A and SGT3A, each a 275/132kV 240 MVA unit
- South Kyle Wind Farm

As described in SPT's RIIO-T1 Business Plan, an increasing amount of generation is contracted to connect at and via New Cumnock 132kV Substation 'Board A'. As per Engineering Justification Paper "*SPT-RI-158 New Cumnock Fault Mitigation and Substation Extension*" (Scheme reference SPT20021)[7], it is proposed to establish additional capacity at New Cumnock by sectionalising the existing 'Board A' and creating a new 'Board C', the latter being connected via two new 360MVA 275/132kV transformers (SGT1C and SGT2C). The need case for the SPT-RI-158 project was accepted by Ofgem at that time, and the project forms part of SPT's RIIO-T2 'Baseline'.

At the time of the RIIO-T2 Business Plan submission it was expected that the new 132kV bays forming part of the new 'Board C' would utilise AIS. In the period since however, detailed design and site survey work has confirmed that due to the nature of the area into which the new AIS 'Board C' was to extend, and the extremely significant earthworks required to create a platform for the new 'Board C' bays, an extension utilising Gas Insulated Switchgear (GIS) is more economic and efficient. The GIS extension to 'Board C' will consist of a double busbar non-SF6 GIS substation comprising five bays:

- 132kV Bus Coupler
- 132kV Harmonic Filter
- SGT1C, a 275/132kV 360MVA unit
- Enoch Hill 132kV (funded via this SPT-RI-237)
- Greenburn Mixed Technology 132kV

5.2 Overview of Options

This section provides a description of each connection option and details the key considerations. A summary of each option is described at the end of this section.

The locations of New Cumnock, Dun Hill and Black Hill 132kV Substations are indicated in Figure 3 above. A connection to either Dun Hill 132kV Substation or Black Hill 132kV Substation was considered but discounted in advance of a detailed cost estimating exercise, for the following reasons: -

- The distance between the Enoch Hill substation site and either Dun Hill or Black Hill is approximately double that compared to New Cumnock (approximately 7km as compared to 3.5km), requiring additional overhead line and/or cable infrastructure through challenging rural terrain;
- Dun Hill 132kV Substation is connected via a double tee arrangement i.e. there is no 132kV busbar system at this site; and
- Both Dun Hill and Black Hill are (and will remain) connected to New Cumnock 132kV Substation 'Board A' - at the time of the Enoch Hill and Monquhill Wind Farm connection applications being received, the SPT-RI-158 New Cumnock Fault Mitigation and Substation Extension project had already been triggered due to the need provide additional thermal capacity, via two new

[7] RIIO-T2 Engineering Justification Paper - EJP_SPT_SPT20021

275/132kV 360MVA transformers and the creation of New Cumnock 'Board C', and the need to mitigate 132kV fault infeed.

5.2.1 Option 1 – Do Nothing or Delay

A 'Do Nothing' or 'Delay' option is not credible in relation to this project and would be inconsistent with SPT's various 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. The proposed works are identified as Enabling Works in the connection agreements relating to the projects in Table 4.

5.2.2 Option 2 – New 33kV circuit from Enoch Hill to New Cumnock

This option would involve the establishment of a new 33kV underground cable circuit (noting the developer's request for a connection via an underground cable as opposed to via an overhead line) from Enoch Hill to New Cumnock 132kV 'Board C'.

At Enoch Hill 33kV Substation, a new 33kV switchboard would be established. At New Cumnock 132kV Substation, a new 132/33kV 90MVA transformer and 33kV switchboard would be established and connected to New Cumnock 132kV Substation 'Board C' via a section of 132kV cable or Gas Insulated Busbar terminated via a new 132kV GIS switchbay.

This option was considered but discounted due to: -

- The difficulties due to particularly poor ground conditions associated with further extending the New Cumnock substation civil platform, beyond the requirements of SPT-RI-158 and associated 132kV Harmonic Filter, in order to establish the new 132/33kV 90MVA transformer compound; and
- The challenges associated with the installation of a 33kV 90MVA underground cable system, expected to require the installation of up to four 630mm^2 Copper cables per phase (due to cable depth requirements), between New Cumnock 275/132kV Substation and Enoch Hill Wind Farm, including in the B741 roadway. Conventional methods of cable installation are unacceptable in proximity to two bridges on the B741, necessitating the use of horizontal directional drilling techniques, with site specific considerations due to the proximity to the River Nith.

5.2.3 Option 3 – New 132kV circuit from Enoch Hill to New Cumnock

This option would involve the establishment of a new 132kV underground cable circuit (noting the developer's request for a connection via an underground cable as opposed to via an overhead line), requiring the installation of one 800mm^2 Aluminium cable per phase, from Enoch Hill to New Cumnock 132kV 'Board C'.

At Enoch Hill 132kV Substation, a new 132/33kV 90MVA transformer and 33kV switchboard would be established. At New Cumnock 132kV Substation 'Board C', the 132kV cable circuit would be terminated via a new 132kV GIS switchbay.

5.3 Option Assessment

As described in our RIIO-T2 Business Plan Annex 8[8], while most engineering justification papers have a Cost Benefit Analysis (CBA) aligned with the RIIO-T2 CBA model, projects in the following categories do not:

[8] Annex 8 - Cost Benefit Analysis Methodology (spenergynetworks.co.uk)

- Live projects rolling over from RIIO-T1, since they have already initiated, with decisions made during the previous price control.
- Customer connection projects, as the proposed approach is based on agreement with the connecting party as they will bear a sizeable proportion of the costs incurred.
- TO Reinforcements associated with new connections, where the options considered are evaluated purely based on the lowest cost solution, which meets the project objectives, as the benefits are all comparable.
- Projects justified through the Network Options Assessment Process as these are subject to an extensive and rigorous CBA process by the Electricity System Operator who can consider market options, and different options which may be offered by Transmission Owners.

Projects in the four categories above have an associated document (this MSIP Re-Opener application in respect of the Enoch Hill Collector Substation and Associated 132kV Circuit project) explaining the feasible options and the reasoning behind the selection of the preferred investment option.

The options relating to the connection of an additional 79MW of contracted renewable generation capacity across Enoch Hill and Monquhill Wind Farms are described in Section 5.2 above, while Table 5 below summarises the key benefits and disadvantage of each option, together with an indication of estimated cost.

Table 5: Option Benefits, Drawbacks and Selection Outcome

No.	Option	Estimated Capital Cost[9]	Key Advantage	Key Disadvantage	Option Outcome
1	Do Nothing or Delay	-	None	Failure to comply with statutory duties and licence obligations.	Rejected
2	New 33kV circuit from Enoch Hill to New Cumnock	[redacted]	Provides the necessary additional capacity.	Would require further extension of the New Cumnock substation platform in the vicinity of 'Board C', and the installation of up to four cables per phase to achieve the required circuit rating.	Rejected
3	New 132kV circuit from Enoch Hill to New Cumnock	[redacted]	Provides the necessary additional capacity.	-	**Proposed**

Option 2 has been discounted due to the site specific considerations noted above associated with extending the New Cumnock substation civil platform and the installation of a 33kV 90MVA underground cable system between New Cumnock 275/132kV Substation and Enoch Hill Wind Farm.

Option 3 is therefore the preferred investment option, delivering the additional transmission capacity required at minimum overall capital cost.

[9] All values are in 2018/19 prices.

6. Proposed Works

6.1 Project Summary

As discussed above, the most appropriate option to deliver the contracted generation connections is to establish a new 132/33kV collector substation, to be known as Enoch Hill 132/33kV Substation, connected to the wider transmission system via a new 132kV underground cable circuit to New Cumnock 132kV Substation 'Board C'.

6.1.1 Enoch Hill 132/33kV Collector Substation Works

The proposed configuration of Enoch Hill 132/33kV Substation is indicated in Figure 6.

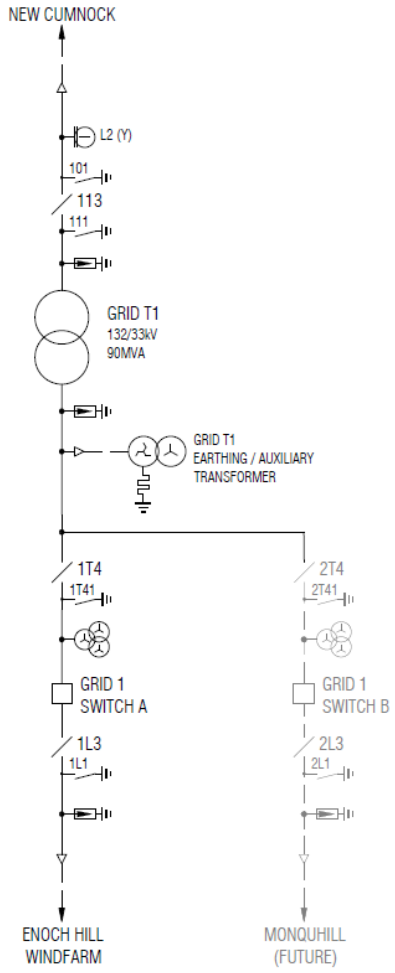

Figure 6: Single Line Diagram – Enoch Hill 132/33kV Substation

To establish the new Enoch Hill 132/33kV collector substation and common 33kV busbar under SPT-RI-237, which will accommodate the two contracted wind farm connections, the following plant and equipment will be installed:

- 132kV AIS feeder bay including cable sealing ends, disconnector with integral earth switches, capacitive voltage transformer, current transformers, surge arresters
- 132/33kV 90MVA transformer Grid T1
- 33kV surge arresters and sealing ends

- 33kV cables
- 33/0.415kV auxiliary/earthing transformer
- 33kV neutral earthing resistor
- 33kV post insulators
- Modular Control Building
- LVAC Board
- Diesel Generator

Environmental and Consent Works - Noting that both Enoch Hill and Monquhill Wind Farms are being progressed by the same developer, the wind farm developer is responsible for all necessary planning consents for constructing Enoch Hill 132/33kV substation compound and control building.

Civil Engineering Works - Noting that both Enoch Hill and Monquhill Wind Farms are being progressed by the same developer, the wind farm developer is responsible for design and construction of an access road from the public highway to Enoch Hill 132/33kV Substation vehicle access gate and site compound. The wind farm developer is also responsible for the provision of a suitable access for construction and a free draining substation platform of suitable bearing capacity.

6.1.2 132kV Cable Works

A 132kV cable circuit of approximate length 5km and capacity 90MVA will be installed between a new feeder bay at New Cumnock 132kV Substation and Enoch Hill 132/33kV Substation. The proposed cable route from New Cumnock to Enoch Hill 132/33kV Substation is indicated in Figure 7.

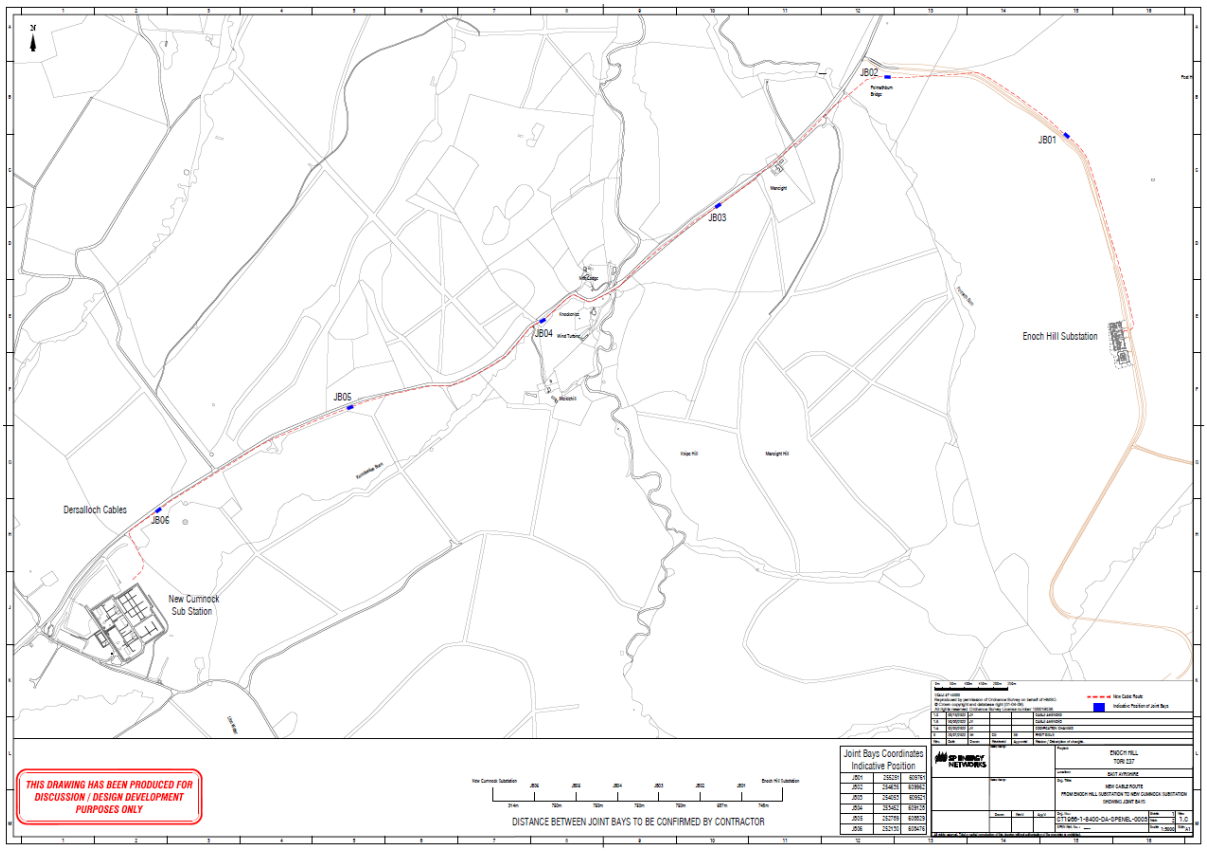

Figure 7: Proposed 132kV Cable Route, New Cumnock to Enoch Hill 132/33kV Substation

The proposed cable route will follow the North Kyle windfarm cables out of the New Cumnock substation site, then will cross these cables local to New Cumnock substation. Following the cable crossing the route shall follow the B741 road and then follow the path of the Enoch Hill Wind Farm access roads toward Enoch Hill 132/33kV collector substation.[10]

The underground cable circuit will be ducted within both New Cumnock and Enoch Hill Substations respectively; however, for the bulk of the route these cables shall be direct buried. The new cable system shall be rated for not less than 90MVA. The proposed cable for this project is 800mm^2 Aluminium.

6.1.3 New Cumnock 132kV Substation Works

The works to take place at New Cumnock 132kV Substation involve terminating the new 132kV cable circuit into the outdoor cable to GIB termination of a new 132kV double busbar GIS feeder bay with associated disconnectors and circuit breaker. This GIS feeder bay forms part of this project.

The proposed configuration of New Cumnock 132kV Substation is indicated in Figure 8.

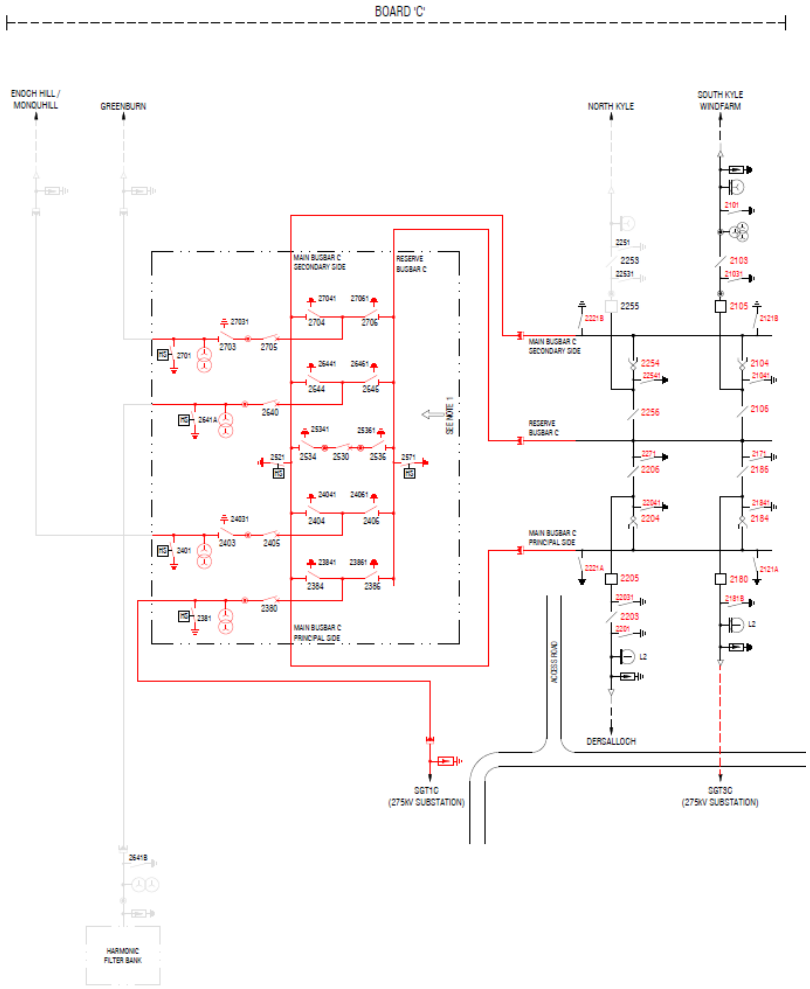

Figure 8: Single Line Diagram – New Cumnock 132kV Substation 'Board C'

[10] For the purpose of establishing the One-Off Cost payable by the wind farm developer, the route of a 132kV overhead line option is assumed broadly similar to the cable route described above, with a short (approximate 250m) cable section required on the entry to New Cumnock 132kV Substation 'Board C'.

In accordance with the SPEN RIIO-T2 sustainability strategy, SPEN is committed to the development and adoption of SF6 free technologies. In line with this, SF6 free GIS will be employed at 132kV.

6.2 Benefits of the Proposed Works

The primary benefit of this proposal is that it allows the connection of an additional 79MW of contracted low carbon generation to New Cumnock 275/132kV Substation, of which 69MW is already consented.

There are no relevant drawbacks associated this package of works.

7. Project Cost Estimate

As agreed with Ofgem, a further submission will be made at the right time relating to the associated amendments to the outputs, delivery date and allowances to be detailed in LSpC 3.14 Appendix 1. The detail in this section is therefore indicative pending that further submission.

7.1 Estimated Total Project Cost

Aligned with the format of the Re-Opener Pipeline Log, Table 6 details expected energisation year and our current view of potential direct capital expenditure in RIIO-T2. The (RIIO-T2) allowances will be subject to the Opex escalator mechanism:

Table 6: Estimated Incidence of Expenditure

		Potential direct capex value per year, £m, 18/19 price base								
Cost Classification	Energisation Year	Pre-RIIO-T2: direct capex	Yr 21/22: direct capex	Yr 22/23: direct capex	Yr 23/24: direct capex	Yr 24/25: direct capex	Yr 25/26: direct capex	Yr 27/28 (T3): direct capex	RIIO-T2 Total: direct capex	Total: direct capex
H1 Shared	2024/25	0.000	0.058	1.414	8.402	2.821	0.000	0.000	12.695	12.695
[redacted]										

*One-Off cost has been calculated as the incremental cost between the cable and overhead line solutions from New Cumnock 132 kV 'Board C' to Enoch Hill 132/33kV Substation

7.2 Potential Volume Driver Allowance

Applying the RIIO-T2 Generation Connections VDUM to this project results in a £5.03m allowance provided by the VDUM. The allowance is calculated as per Table 7 below. Please note that this excludes the further allowance permitted under Licence Special Condition 3.36 Opex escalator to provide a better comparison to direct expenditure.

Note that this MSIP Re-Opener application, and the assessment of the allowance provided by the VDUM, is based on the equivalent overhead line solution between New Cumnock 132kV 'Board C' and Enoch Hill 132/33kV Substation. This is due to the developer's request for a cable solution, and as such the developer will fund the incremental cost between the cable and overhead line solutions as a One-Off Cost.

Table 7: Volume Driver Allowance

Volume Driver (*2018/19 price base*)		£m/unit	Unit	Volume Driver Allowance (£m)
Project	Fixed Cost	1.700	1.00	1.700
Shared Use	Transformer, MVA	0.010	90	0.900
	132 new conductor km (pole)	0.411	4.80	1.973
	Cable <1km	1.820	0.25	0.455
Total				**5.028**

Table 8: Comparison of Volume Driver Allowance and Estimated Cost

		Potential direct capex value per year, £m, 18/19 price base								
Description	Pre-RIIO-T2: direct capex	Yr 21/22: direct capex	Yr 22/23: direct capex	Yr 23/24: direct capex	Yr 24/25: direct capex	Yr 25/26: direct capex	Yr 26/27 (T3): direct capex	Yr 27/28 (T3): direct capex	RIIO-T2 Total: direct capex	Total: direct capex
Allowance	0.000	0.000	1.257	1.257	1.257	1.257	0.000	0.000	5.028	5.028
Cost	0.000	0.058	1.414	8.402	2.821	0.000	0.000	0.000	12.695	12.695
Variance	0.000	-0.058	-0.157	-7.145	-1.564	1.257	0.000	0.000	-7.667	-7.667

The potential VDUM allowance for the project is lower than the estimated cost by £7.67m. This is more than £4.24m, which is the threshold set in LSpC 3.14.6(a) for consideration under this uncertainty mechanism.

7.3 Regulatory Outputs

The indicative regulatory outputs for the project, including primary assets outputs, are identified in Tables 9 and 10 below:

Table 9: Primary Load Output

Primary Load Output Type	Economic Regulatory Unit
Generation Connection, MVA	90

The above is based on the rating of the planned 132/33kV 90MVA transformer at Enoch Hill 132/33kV Substation.

Table 10: Regulatory Outputs Table (Volumes)

Asset Category	Asset Sub-Category Primary	Voltage	Forecast Additions	Forecast Disposals
Circuit Breaker	CB (Gas Insulated Busbar)	132kV	1	0
Other switchgear	Disconnector (AIB)	132kV	1	0
Other switchgear	Earth Switch (AIB)	132kV	2	0
Cable	Circuit Cable - 1 core per phase	132kV	4.8 km	0
Wound Plant	Transformer	132kV<=90MVA	1	0
Protection & Control	Feeder Protection	132kV	1	0
Protection & Control	Wound Plant Protection	132kV	1	0

7.4 Alignment with Other Projects

The Enoch Hill collector substation and associated 132kV circuit is one of several projects affecting New Cumnock 275/132kV Substation during the RIIO-T2 period. Other project works include:

- SPT-RI-213 – the installation of a new auto-transformer on site, to be identified as SGT2B, a 240MVA 275/132kV unit to be connected to New Cumnock 132kV 'Board B'.

- SPT-RI-158 – the splitting of the New Cumnock 132kV 'Board A', between Bays 6 and 7, to form a New Cumnock 132kV 'Board C', connected via two new 360MVA 275/132kV

transformers (SGT1C and SGT3C). The new 'Board C' bays will be achieved via GIS switchgear, with gas insulated busbars connecting the original AIS bays to the new GIS bays.

- North Kyle Wind Farm connection (212MW TEC).
- New Cumnock 132kV Harmonic Filter - the installation of a new 132kV 20Mvar harmonic filter to be connected to New Cumnock 132kV 'Board C'.

The works for Enoch Hill will be co-ordinated with these other projects.

The capital expenditure estimate in Section 7.1 is incremental to the projects detailed above and is related to the establishment and connection of Enoch Hill 132/33kV Substation.

8. Project Delivery

We have applied our project management approach to ensure that this project work is delivered safely, and in line with the agreed time, cost and quality commitments. We have a proven track record of delivering essential transmission network upgrade projects and will draw upon this knowledge and experience to effectively manage this project. We have assigned a dedicated Project Manager to this project who will be responsible for overall delivery of the scope and is the primary point of contact for all stakeholders.

8.1 Delivery 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. Table 11 summarises the key project milestones within the delivery schedule.

Table 11: Key Project Milestone

Milestone	Project Phase	Estimated Completion Date
1	ITT Main Substation Civil Works	September 2022
2	IP3 Stage 2	December 2022
3	Consents Obtained	March 2023
4	Award Main Substation Civil Works	April 2023
5	Commence Main Site works	August 2023
6	Complete Site works	March 2025 [11]

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.

8.2 Project Risk and Mitigation

A Project Risk Register was generated collaboratively during the project kick-off meeting to identify any risks, which if realised, could result in deviation from the project delivery plan. Mitigation strategies have also been 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 by the project team. Currently, the top project risks are:

[11] Aligned with programmed completion of SPT-RI-158.

8.3 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:

8.3.1 Quality Requirements During Project Development

Any risk or opportunity that may affect the quality of the product are detailed in the Project Risk Register (that is noted in Section 6.5 above).

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

8.3.2 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.

8.3.3 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.

8.3.4 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.

8.4 Stakeholder Engagement

SPT is committed to delivering optimal solutions in all of the projects we undertake. A key part of this is engaging with relevant stakeholders throughout the project development and delivery process. Stakeholders can include customers, regulatory bodies and other statutory consultees, national and

local government, landowners, community groups, and local residents and their representatives (e.g. MPs, MSPs and councillors).

Community impacts associated with construction activities are considered at project initiation by completion of a Community Communications Plan, which details the stakeholders relevant to the project, the communication channels that will be used to engage with them, the information that will be provided to and sought from them, and the timescales over which this will happen. It considers any particular sensitivities that may require increased stakeholder consultation and details specific events that will be held with stakeholders during the course of the project.

As part of this project, SPT has engaged with statutory consultees associated with the planning application for these works - the Local Authority, SEPA and NatureScot - and the third-party landowner Forestry Land Scotland. We have also engaged with the other stakeholders, including community councils and local residents.

Due to the location and nature of this project, no particular sensitivities or community impact issues have been identified, but a general level of interest from local representatives has been noted and we will continue to engage with them throughout the project.

9. Conclusion and Recommendations

This MSIP Re-opener application demonstrates the need to carry out infrastructure work and establish Enoch Hill 132/33kV Substation and associated 132kV circuit to New Cumnock 132kV Substation, within the RIIO-T2 period (April 2021 – March 2026), to enable the timely and efficient connection of up to 79MW of contracted onshore wind generation.

The main conclusions of this submission are:

- The timely connection of low carbon generation, such as onshore wind, will play a vital role in reaching legislated net zero targets, and is aligned with SPT's RIIO-T2 strategic goals.

- It is necessary to invest in transmission infrastructure at Enoch Hill 132/33kV Substation, and between Enoch Hill 132/33kV and New Cumnock 275/132kV Substations, to facilitate the connection of 79MW of contracted onshore wind generation, this having been identified as the most economic and efficient option.

- Applying the RIIO-T2 Generation Connections VDUM to this project results in the £12.70m estimated cost being £7.67m higher than the £5.03m allowance provided by the VDUM. An MSIP Re-opener application is therefore required. Submission of this MSIP Re-opener application is aligned with the contracted connection programme.

We, respectfully, request Ofgem's agreement to the following:

- The option being progressed addresses a clear customer need and represents value to UK consumers, therefore, the project should proceed based on the preferred solution (Option 3).

- Efficient expenditure is fully funded, as necessary to maintain programme timelines and mitigate project delivery risk e.g. order long-lead equipment, prior to the second stage submission and assessment.

10. Appendix - SP Transmission System, Geographic Overview