MSIP Re-opener Application – Inch Cape Offshore Wind Farm		
Ofgem Scheme Reference/ Name of Scheme	SPT200201 Inch Cape Offshore Wind Farm	
Investment Category	Local Enabling (Entry)	
Primary Investment Driver	Connection of customer-driven offshore 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)	
Total Project Cost (£m)	5.34	
Funding Allowance (£m)	To be confirmed	Requested
Output 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 2022	1	First issue of document.

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Table of Contents

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
ICOL	Inch Cape Offshore Limited
ITT	Invitation to Tender
Km	Kilometre
kV	Kilovolt
LC	Licence Condition
LSpC	Licence Special Condition
MSIP	Medium Sized Investment Project
MSCDN	Mechanically Switched Capacitor with Damping Network
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
OTNR	Offshore Transmission Network Review
OFTO	Offshore Transmission Owner
PCD	Price Control Deliverable
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 SP Transmission's plans to carry out infrastructure work at Cockenzie 275kV Substation, within the RIIO-T2 period (April 2021 – March 2026), required to enable the connection of the 1,080MW Inch Cape Offshore Wind Farm.

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 £5.34m estimated total project cost being £7.16m lower than the £12.5m 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 for connection at Cockenzie 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, 3.16, 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 1

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 duties:-

- 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.

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

- To always 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 always 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 its transmission system available for the purpose of conveying, or affecting the flow of, electricity and to ensure that the system is fit for purpose (LC D2); and
- To offer to enter into an agreement with the system operator upon 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 the following 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 offshore wind, will play a vital role in reaching these legislated net zero targets.

The UK Government announced in October 2020 its commitment to make the UK a world leader in green energy and boosted the UK Government's previous 30GW target for offshore wind to 40GW by 2030. The Scottish Government ambition is 11GW of offshore wind in Scotland by 2030. 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.

On 9th September 2021, the Department for Business, Energy & Industrial Strategy (BEIS) announced the budget for the next Contracts for Difference (CfD) auction, Allocation Round 4, which launched on 13th December 2021. £265m per year will be provided in the fourth round of the scheme, which aims to double the renewable electricity capacity secured in the third round and generate more than the previous three rounds combined. For the first time since 2015, established technologies, including onshore wind and solar, will also be able to bid. Offshore wind has the largest budget allocation of

£200m[2]. Given lowering technology costs and a favourable subsidy regime, we expect this will support a considerable number of renewables projects to successfully transition from project inception and development through to energisation[3].

4.3 Inch Cape Offshore Wind Farm

In May 2008, The Crown Estate requested expressions of interest from parties seeking to develop commercial scale offshore wind farms in Scottish Territorial Waters. In February 2009 development rights were granted for several sites within Scottish Territorial Waters. One of these sites relates to Inch Cape Offshore Wind Farm, a proposed development between 15 and 22km off the Angus Coast in the east of Scotland. The location of the proposed offshore development is indicated in Figure 1.

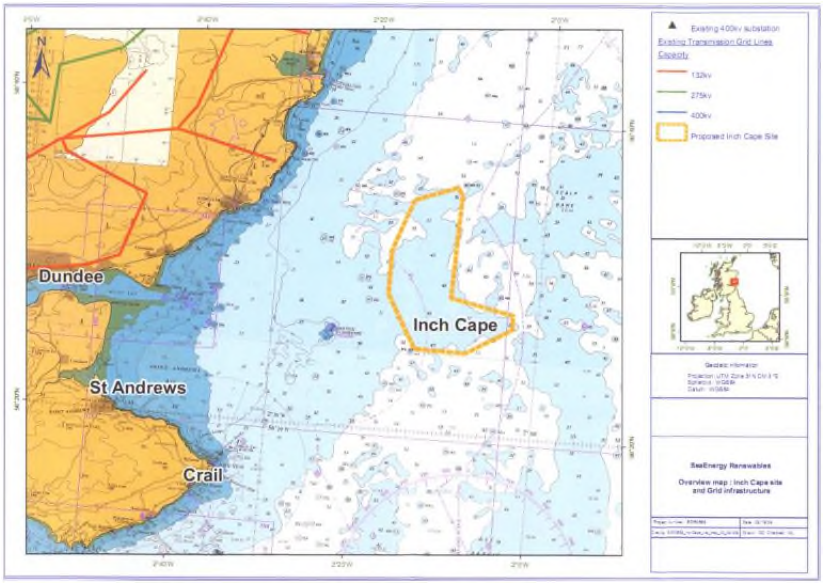

Figure 1 Location of Inch Cape Offshore Windfarm

Inch Cape Offshore Wind Farm is owned by Inch Cape Offshore Limited (ICOL), a joint venture between Red Rock Power Limited and ESB.

The status of the proposed development is summarised as follows:

- A connection agreement is in place for the proposed development, with 1,080MW Connection Entry Capacity (CEC) and two Interface Points (between the Offshore Transmission System and Onshore Transmission System) to be located at Cockenzie 275kV Substation.
- The offshore wind farm has secured consents for an up to 72 turbine development.
- The developer has secured Planning Permission in Principle for the onshore aspects of the offshore transmission development and has signed an associated land agreement with East Lothian Council.
- The development has not yet secured a CfD – Allocation Round 4 closed on 14th January 2022 and results are expected to be announced in spring or summer 2022.

Further detail regarding Inch Cape Offshore Wind Farm can be found on the developer's website [4].

[2] Biggest ever renewable energy support scheme backed by additional £265 million - GOV.UK (www.gov.uk)
[3] BEIS Electricity Generation Costs (2020) - GOV.UK (www.gov.uk)
[4] Inch Cape Offshore Wind Farm (inchcapewind.com)

4.4 Connection of Inch Cape Offshore Wind Farm

An application for connection in respect of the proposed Inch Cape Offshore Wind Farm was first received in [redacted], at that time for a 1,050MW offshore development.

Connection offers for offshore generation applications are based on the most economic and efficient Interface Point(s) in view of the complete onshore/ offshore network solution. In accordance with STC Procedure (STCP) 18-1, a Connection and Infrastructure Options Note (CION) was therefore developed, co-ordinated by National Grid Electricity Transmission (now NGESO) in collaboration with SPT, Scottish Hydro-Electric Transmission (SHET) and the offshore developer.

The CION considered the high-level offshore network design and onshore infrastructure works necessary to accommodate the proposed Inch Cape Offshore Wind Farm at alternative locations in the SHET, SPT and National Grid Electricity Transmission (NGET) transmission areas. The CION process recommended the connection of Inch Cape Offshore Wind Farm at SPT's Cockenzie 275kV Substation. The developer has requested two Interface Points between the Offshore and Onshore Transmission Systems.

A Bilateral Connection Agreement is therefore in place between NGESO and the developer on this basis, with a corresponding Transmission Owner Construction Agreement in place between NGESO and SPT.

The offshore wind farm will be connected to shore through two 220kV subsea cable circuits to a new onshore substation, which is to be constructed by the developer on the site of the former Cockenzie Power Station. This onshore substation will comprise 220/275kV transformers, associated switchgear and reactive compensation equipment. It will be connected to two Interface Points, located within SPT's Cockenzie 275kV Substation, via two 275kV underground cable circuits which will form part of the offshore transmission system.

The two Interface Points will be located at the busbar clamps at the top of the 275kV cable sealing ends, which will be installed by the developer at the 9.3m level within the Cockenzie 275kV Substation building. The developer is responsible for all works between the offshore wind farm and the onshore Interface Points. SPT is responsible for the remainder of the connection works, to which this MSIP Re-opener application relates.

Since the original connection application was made, the design of the Inch Cape offshore development has evolved and the CEC has increased from the original 1,050MW to the current 1,080MW. The contracted connection date is presently 31st October 2023 (with TEC from 1st April 2024).

[redacted]

[redacted] SPT works in respect of the proposed Seagreen Phase 1A connection do not form part of this Re-opener application.

4.5 Offshore Transmission Network Review Interaction

SPT, together with SHET, NGET and NGESO, is actively engaged across relevant workstreams of the BEIS/ Ofgem Offshore Transmission Network Review[5] (OTNR). [redacted]

4.6 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 Inch Cape Offshore Wind Farm connection, are summarised below:

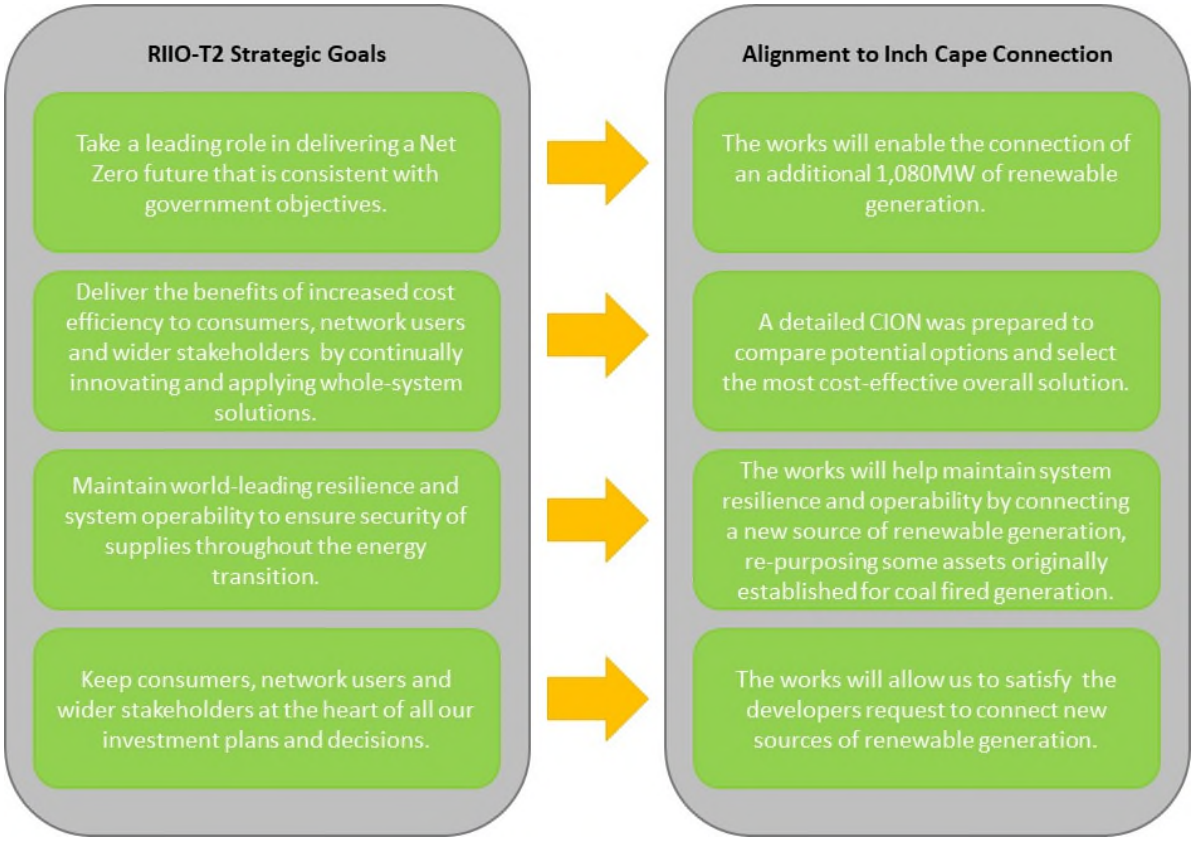

Figure 2: Alignment of the Inch Cape Connection Proposal with SPT RIIO-T2 Strategic Goals

[5] Offshore transmission network review - GOV.UK (www.gov.uk)
[6] SP Energy Networks RIIO-T2 Business Plan

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 1,080MW Inch Cape Offshore Wind Farm 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.

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

Following the application for connection, a CION process was undertaken, co-ordinated by National Grid Electricity Transmission (now NGESO) in collaboration with SPT, SHET and the offshore developer to determine the most cost-effective connection point on a whole systems basis. The CION process recommended the connection of Inch Cape Offshore Wind Farm at SPT's Cockenzie 275kV Substation.

A further optioneering process was subsequently undertaken to assess alternative solutions for the connection at Cockenzie 275kV Substation.

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

The works will help maintain system resilience and operability by connecting a new source of renewable generation, re-purposing some assets originally established to facilitate the connection of the coal fired 1,152MW Cockenzie Power Station, which ceased generation in March 2013.

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

The completion of the Inch Cape Offshore Wind Farm connection at Cockenzie 275kV Substation will allow SPT to satisfy a 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 Inch Cape Offshore Wind Farm connection at Cockenzie 275kV Substation will continue to align with our future strategic ambitions.

5. Assessment of Options

Three options to deliver a connection at Cockenzie 275kV Substation are summarised below. These includes a 'Do Nothing or Delay' option as well as two alternative technical solutions.

5.1 Existing System Configuration at Cockenzie

Cockenzie 275kV Substation is an indoor substation utilising Air Insulated Switchgear (AIS) in a "breaker and a half" configuration. The 275kV equipment is installed across three levels within the substation building: ground level; a 9.3m level; and a 15.7m level.

As detailed Figure 3, the existing Cockenzie 275kV Substation connects the following circuits:

- Kaimes 275kV
- Smeaton 275kV
- SGT1 (275/33kV 120 MVA)
- SGT2 (275/33kV 120 MVA)
- MSCDN1 (275kV 225Mvar)
- Eccles No.1 (Cockenzie SGT3, 400/275kV 1000 MVA)
- Eccles No.2 (Cockenzie SGT4, 400/275kV 1000 MVA)

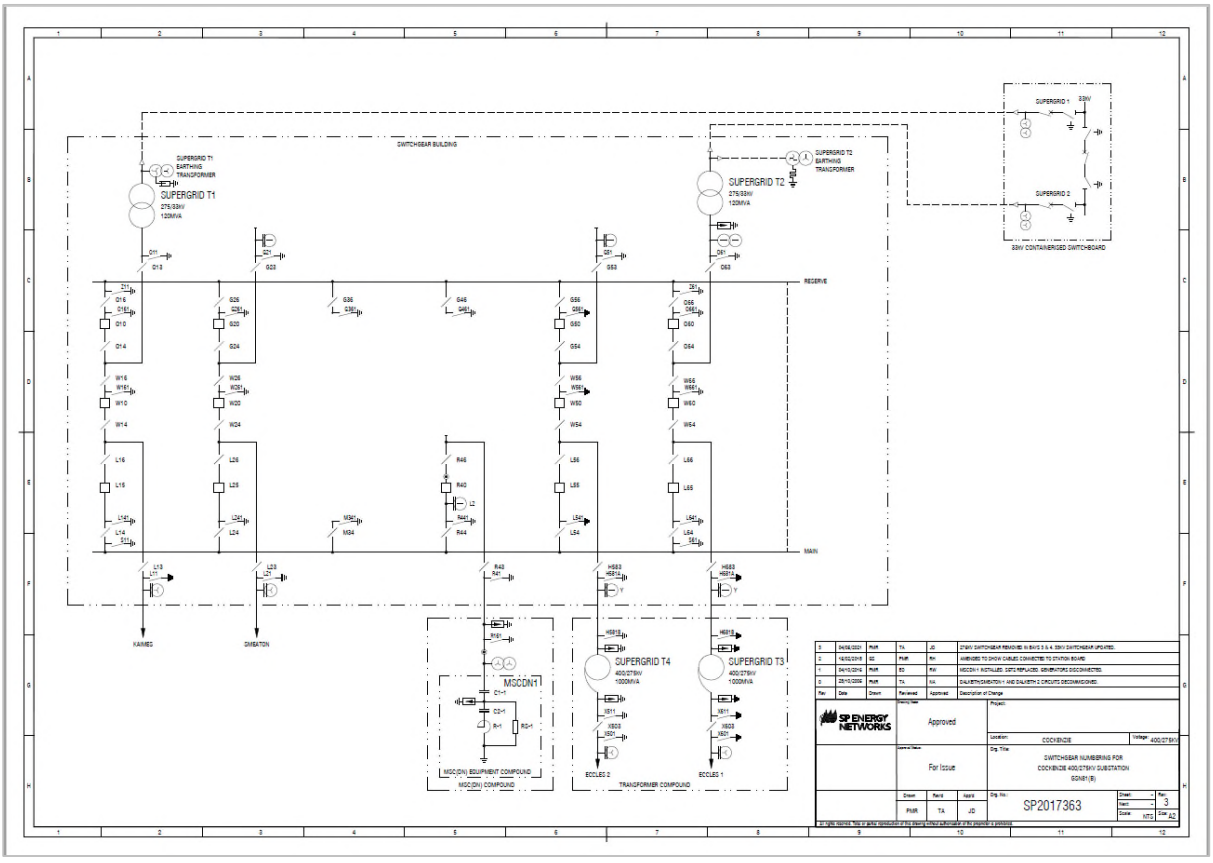

Figure 3 Existing Configuration – Cockenzie 275kV Substation

5.2 Overview of Short-Listed Options

This section provides a description of three options to connect Inch Cape Offshore Wind Farm at Cockenzie 275kV Substation and details the key considerations.

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 Condition D4A, which requires SPT to offer to enter into an agreement with the system operator upon receipt of an application for connection, or for modification to an existing connection.

5.2.2 Option 2 – Population of Spare Bay

Option 2 would involve the population of the spare bay at Cockenzie 275kV Substation in a full 'breaker and a half' configuration. This spare bay is shown dotted on the right-hand side of Bay 6 in Figure 3 above.

The Interface Points would be at the busbar clamps at the top of the 275kV cable sealing ends, to be installed by the developer on the 9.3 metre level internal to Cockenzie 275kV Substation.

The first Interface Point would be located on the 'G' / ex-generator side of the substation with the second Interface Point located on the 'L' / line side. The 'G' side of the substation building was specifically designed to accommodate such cable circuit connections. However, the 'L' side was designed to accommodate overhead line connections. To accommodate a cable connection on this side of the substation, it would be necessary to extend the side of the existing substation building by an area of approximately 8m x 14 m. This extension would incorporate an internal 9.3m level, on which the developer would install the 275kV cable sealing ends. It would be necessary to divert the existing access road outside the building to accommodate such a building extension.

The arrangement described above formed the basis of the CION and early Transmission Owner Construction Agreement, prior to the termination of the connection agreement in respect of Cockenzie Generating Station.

5.2.3 Option 3 – Repurpose Former Cockenzie Power Station Bays

[redacted] Cockenzie 275kV Substation therefore now comprises four former Cockenzie Power Station Generator Transformer bays.

Option 3 involves a revised connection arrangement at Cockenzie 275kV Substation compared to that of Option 2, enabled by the disconnection of Cockenzie Generation Station. The proposed configuration utilises two of the four ex-Cockenzie generator bays. It provides a more economical solution than Option 2 arrangement, minimising the scope of SPT works, in part by re-using some existing equipment, but primarily by avoiding the requirement to extend the 275kV building and divert substation access roads. All SPT works associated with Option 3 are within the existing Cockenzie 275kV Substation building, and no associated planning consents are required.

Provision of connection to Inch Cape Offshore Wind Farm via two of the former Cockenzie Power Station bays reflects the prevailing contracted connection arrangement.

The proposed (Option 3) configuration of Cockenzie 275kV Substation is indicated below:

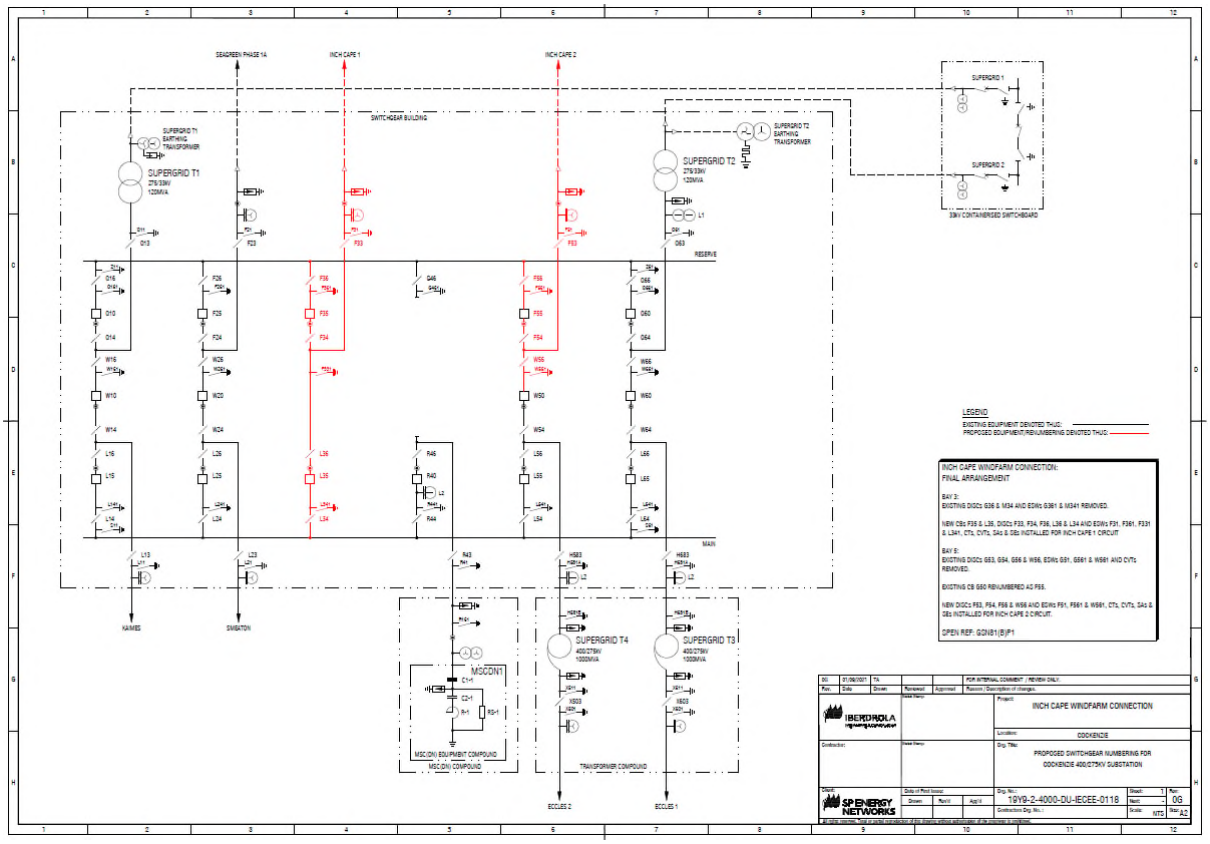

Figure 4 Proposed Configuration – Cockenzie 275kV Substation

Two of the four former Cockenzie Power Station bays have been allocated for the Inch Cape development with one allocated to the Seagreen Phase 1A development, as summarised below[7]:

- Bay 2 currently consists of three circuit breakers with one circuit to Smeaton 275kV Substation with facilities for one cable feeder, which will be used for the single Seagreen 1A 275kV circuit.
- Bay 3 is now out of use but has facilities for one cable feeder, which will be used for the Inch Cape No. 1 circuit.
- Bay 5 currently consists of three circuit breakers with one circuit to Eccles 400kV Substation (via Cockenzie SGT4), with facilities for one cable feeder, which will be used for the Inch Cape No. 2 circuit.

The connection arrangement described above facilitates the physical co-ordination of the two contracted offshore developments in proximity to Cockenzie 275kV Substation. It avoids the requirement for the Seagreen Phase 1A onshore cable system to cross that of the Inch Cape No.1 onshore cable system. Such a cable crossing would impact on the cost and risk associated with the onshore aspects of the offshore developments. [redacted]

[7] It is noteworthy that provision of a double busbar connection to a third party connection via Cockenzie Bay 4 is not readily achievable following the connection of Cockenzie MSCDN No.1 as part of a wider suite of works completed in RIIO-T1 to increase transfer capability from Scotland to England.

Similar to Option 2, the developer is responsible for the design and installation of 275kV cable and associated cable sealing ends internal to SPT's Cockenzie 275kV Substation building. SPT is responsible for the necessary switchgear, protection and control related works at Cockenzie, and the extension of busbar connections to the top of the developer's 275kV cable sealing ends. SPT is also responsible for all associated building modification works and the removal of redundant assets to facilitate the new connections.

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:

- 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 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 to those 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 Inch Cape Offshore Wind Farm) explaining the feasible options and the reasoning behind the selection of the preferred investment option.

The short-listed options relating to the connection of Inch Cape Offshore Wind Farm at Cockenzie 275kV Substation are described in Section 5.2 above, while Table 4 below summarises the key benefits and disadvantage of each option.

Table 4: 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	Population of Spare Bay	£5.76m	Avoids need to remove some redundant equipment.	Higher capital cost relative to Option 3. Requires extension of substation building. Increased technical and planning risks.	Rejected
3	Repurpose Former Cockenzie Power Station Bays	£5.34m	Lower capital cost relative to Option 2. No substation extension required. Reduced technical risk and no planning risk.	Requires removal of some redundant equipment.	Proposed

[8] Annex 8 - Cost Benefit Analysis Methodology (spenergynetworks.co.uk)
[9] All values are in 2018/19 prices.

Option 3 is therefore the preferred investment option, minimising capital cost and avoiding the need to extend the 275kV building at Cockenzie 275kV Substation.

The timing of the proposed capital investment is aligned with the contracted connection programme. Should the developer terminate their Bilateral Connection Agreement, consumers are protected from the costs of abortive works by the standard industry framework for securities.

There is no market based alternative to the preferred investment option.

6. Proposed Works

6.1 Project Summary

The proposed configuration of Cockenzie 275kV Substation is indicated in Figure 4 above. Two Interface Points between the Onshore Transmission Systems and Inch Cape Offshore Transmission System will be located at the busbar clamps at the top of the 275kV cable sealing ends, which will be installed by the developer at the 9.3m level within the Cockenzie 275kV Substation building. The developer is responsible for all works between the offshore wind farm and the onshore Interface Points. SPT is responsible for the remainder of the connection works (to which this MSIP Re-opener application relates).

The Inch Cape No. 1 connection at Cockenzie 275kV Substation will be provided by establishing a two circuit-breaker configuration in Bay 3. This bay will be re-constructed such that any future return to breaker and a half configuration can be accommodated. The existing relay room has sufficient space to install the associated protection and control equipment.

The Inch Cape No.2 connection at Cockenzie 275kV Substation will be provided by retaining the existing breaker and a half configuration and partly refurbishing Bay 5. The original air blast circuit breakers were replaced in 2003 by more modern SF_6 breakers, which will be retained, but the associated 1960s disconnectors and earth switches will be replaced. The existing CTs and VTs are not suitable for re-use and will also be replaced. The existing relay room has sufficient space to install the associated protection and control equipment.

The following new plant and equipment will be installed:-

- 275kV circuit breakers (Bay 3 only)
- 275kV disconnectors with integral earth switches
- 275kV free-standing earth switch (Bay 3 only)
- 275kV surge arresters
- 275kV current transformers
- 275kV capacitive voltage transformers, with power quality monitoring
- 275kV post insulators
- 275kV busbars, flexible conductors, connectors and clamps
- Protection and control equipment

Due to the specific indoor design of Cockenzie 275kV Substation, the new 275kV disconnectors and circuit breakers will require to be of non-standard design e.g. to ensure phase to earth clearance from the building steelwork and 9.3m level above, the maximum height from ground level of the new circuit breakers is approximately 6.150m, requiring a horizontal live tank interrupter design.

6.2 Environmental and Consent Related Works

SPT works are all within Cockenzie 275kV Substation and no land acquisition or planning consent is required. Due to the age of the existing assets at Cockenzie 275kV Substation, asbestos containing materials (ACMs) are known to be present. Appropriate precautions will require to be taken to contain any hazards resulting from construction activities, notably, work on the multicore cable trenches within the building.

A detailed asbestos survey will inform the construction working methods and any asbestos identified will be removed in accordance with the relevant regulations.

6.3 Civil Engineering Works

Cockenzie 275kV Substation is of an indoor design dating from the 1960s and presents some site-specific considerations. The primary civil engineering works for the Inch Cape Offshore Wind Farm connection comprise:

- The dismantling and removal of existing electro-mechanical equipment;
- The design and construction of new foundations and structures necessary to support the new equipment within the existing substation building;
- Enabling works to achieve the above e.g. works to facilitate temporary and/or enduring accesses for construction, operation and maintenance purposes.

6.3.1 Existing Building Structure

The existing building structure shall be inspected and assessed for suitability and strengthening/ remedial works undertaken where necessary. Parts of the existing concrete flooring will require to be removed at the various levels within the building and modifications will be required to the existing steelwork and lifting equipment/ wells.

6.3.2 Demolition and Dismantling Works

Re-purposing some of the infrastructure at Cockenzie 275kV Substation provides overall savings to the project relative to the alternative option, however the removal of some existing redundant equipment is required to provide space to facilitate the new connections to the Inch Cape Interface Points.

Demolition works shall include the decommissioning, dismantling, removal and disposal of all existing plant and associated support structures and foundations as necessary to facilitate the installation of the new electro-mechanical equipment, including but not limited to earth switches, disconnectors, relays and other protection, control or battery room panels.

The existing 275kV cables on ex-generator transformer 1 and 3 (substation bay 5 and 3, respectively) are out of service and have been drained of fluid. The cable sealing ends will be removed and the 275kV cables cut and removed from land owned by SPT as required.

6.3.3 Structures and Foundations

The civil engineering works shall also include all foundations and supports structures necessary for the electromechanical plant. This shall include but is not limited to the following items; current transformers, disconnectors, earth switches, post insulators, capacitive voltage transformers and surge arrestors. The final design of all structures and foundations shall consider the underlying condition of the building, which will be assessed along with environmental and electromechanical loading.

6.3.4 Cable Trenches

Several existing trenches are present within the floor slab of the building across the switchroom hall. Cables trenches will be retained and re-used as far as possible however these shall be cleared of ACMs prior to any work to run cable or services.

The existing trenches are covered with concrete lids which are in good condition overall due to being indoors throughout their usage. Where trenches are being retained the existing concrete covers shall be retained, however provision shall be made for mechanical lifting for ease of operation and maintenance.

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 5 details expected energisation year and our current view of potential direct capital expenditure in RIIO-T2.

Table 5: Estimated Incidence of Expenditure

	Potential direct capex value per year, £m, 18/19 price base									
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 26/27 (T3): direct capex	Yr 27/28 (T3): direct capex	RIIO-T2 Total: direct capex	Total: direct capex
2024/25	0.31	0.04	0.23	3.21	1.55	0	0	0	5.03	5.34

7.2 Potential Volume Driver Allowance

Applying the RIIO-T2 Generation Connections VDUM to this project results in a £12.5m allowance provided by the VDUM. The allowance is calculated as per Table 6 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.

Table 6.1: Volume Driver Allowance

Volume Driver (*2018/19 price base*)		£m/unit	Unit	Volume Driver Allowance (£m)
Project	Fixed Cost	1.700	1.00	1.70
Sole/shared Use	General Substation Works, MW	0.010	1080	10.80
Total				**12.5**

Table 6.2: 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	3.125	3.125	3.125	3.125	0	0	0	12.5	12.5
Cost	0.31	0.04	0.23	3.21	1.55	0	0	0	5.03	5.34
Variance	-0.31	3.085	2.895	-0.085	1.575	0	0	0	7.47	7.16

The potential VDUM allowance for the project is higher than the estimated cost by £7.16m. 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 7 and 8 below:

Table 7: Primary Load Output

Primary Load Output Type	Economic Regulatory Unit
Generation Connection, MW	1080

Table 8: Regulatory Outputs Table (Volumes)

Asset Category	Asset Sub-Category Primary	Voltage	Forecast Additions	Forecast Disposals
Circuit Breaker	CB (Air Insulated Busbar)	275kV	2	
Other switchgear	Disconnector (AIB)	275kV	9	6
Other switchgear	Earth Switch (AIB)	275kV	7	5
Instrument Transformers	Voltage Transformer (VT)	275kV	2	1
Instrument Transformers	Current Transformer (CT)	275kV	5	1

7.4 Alignment with Other Projects

The Inch Cape Offshore Wind Farm connection is one of several projects at Cockenzie 275kV Substation during the RIIO-T2 period. Other project works include:

- Cockenzie Building Improvement
- Cockenzie 275kV CT Replacement (33 units, driven by condition)
- Cockenzie 275kV CVT Replacement (20 units, driven by environmental legislation)
- Protection Modernisation
- Seagreen 1A Offshore Wind Farm Connection

The works for Inch Cape 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 connection of Inch Cape Offshore Wind Farm.

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 9 summarises the key project milestones within the delivery schedule.

Table 9 Key Project Milestone

Milestone	Project Phase	Estimated Completion Date
1	ITT Main works (BOP)	August 2022
2	IP3 Stage 2	March 2023
3	Award main works (BOP)	April 2023
4	Commence Site works	September 2023
5	Complete Site works	October 2024

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:

- Impact of Covid on supply chain and resource
- Impact of Brexit on the supply of plant and materials
- Asbestos
- Civil works

8.3 Quality Management

SPT Projects shall undertake regular inspections on projects and contractors to monitor and measure compliance with contract specifications. All inspections shall be visual, with the person undertaking the inspection ensuring that evidence of the inspection and any actions raised are documented.

The following inspections shall be completed:

- Quality Inspections (monthly)
- Environmental Inspections (monthly)
- 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.

8.4 Stakeholder Engagement

The developer of the Inch Cape Offshore Wind Farm has been engaged throughout the design/ development phase of the project from initial connection application and CION development. The developer will continue to be fully engaged throughout the delivery of SPT's project works to ensure works are aligned where appropriate and the project programme is achieved. Monthly program and design interface meetings are currently held with both ICOL and the Seagreen Phase 1A developer to co-ordinate all works being undertaken at Cockenzie.

There will be minimal impact on the local community arising from SPT's works, which are contained to SPT owned land and within the 275kV Substation building at Cockenzie.

9. Conclusion and Recommendations

This MSIP Re-opener application demonstrates the need to carry out infrastructure work at Cockenzie 275kV Substation, within the RIIO-T2 period (April 2021 – March 2026), to enable the timely and efficient connection of the 1,080MW Inch Cape Offshore Wind Farm.

The main conclusions of this submission are:

- The timely connection of low carbon generation, such as offshore 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 to facilitate the connection of Inch Cape Offshore Wind Farm at Cockenzie 275kV Substation, this having been identified as the most economic and efficient connection location following a collaborative CION process.

- There is no evidence to indicate that future offshore network coordination will have a material impact on the onshore works proposed. In view of its advanced development status, the Inch Cape Offshore Wind Farm project is not "in scope" of the OTNR "Pathway to 2030" Workstream.

- Applying the RIIO-T2 Generation Connections VDUM to this project results in the £5.34m estimated cost being £7.16m lower than the £12.5m 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.