MSIP Re-opener Report

Elland New 132kV NPg Bay

January 2024

nationalgrid

Contents

The table below signposts the structure of the document and sets out the purposes of each of the sections. This also lists the appendices. We invite Ofgem to consider the proposals set out in this submission and raise queries against anything that may require further clarification.

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Abbreviations

Table of Abbreviations

Abbreviation	Term
AIS	Air Insulated Switchgear
BESS	Battery Energy Storage System (BESS)
CBA	Cost Benefit Analysis
DNO	Distribution Network Operator
ELLA1	Elland 132kV substation
GSPs	Grid Supply Points
kV	Kilovolt (1,000 volts)
MSIP	Medium Sized Investment Project
MW	Megawatt
NGET	National Grid Electricity Transmission
NPg	Northern Powergrid
PCD	Price Control Deliverable
PoC	Point of Connection
RIIO	Revenues = Incentives + Innovation + Outputs
SGTs	Super Grid Transformers
TEC	Transmission Entry Capacity
TO	Transmission Owners
UM	Uncertainty Mechanism

Executive summary

1. This Medium Sized Investment Project (MSIP) submission to Ofgem by National Grid Electricity Transmission (NGET) details and requests funding for the proposed Elland customer connection during RIIO-T2. This is submitted under the MSIP re-opener provided for in Special Condition 3.14 of the NGET Transmission Licence.

2. This paper demonstrates the need for XXXX of which XXXX are direct investments. These costs are for Elland 132kV Substation in West Yorkshire (the 'Investment'), and this paper summarises the optioneering analysis that led us to our proposed solution, which is to provide a connection to existing busbars via a spare bay, enabling Northern Powergrid (NPg) to construct their generation bay equipment.

3. This is a statutory requirement on the back of a connection application made by NPg. A viable option is available, and NGET are confident in the customer connection demand and its associated timeline, based on the strategic need being aligned to government goals and progress made on customer plants (which will generate the new demand) to date. The paper is divided into seven main sections.

4. Section 1 – the **Introduction** - positions the Investment within the context of NGET's investment plan. It confirms the methodology and regional context relevant to this submission. For the Investment, this paper should be read in the context of increasing transfer capacity between the transmission and distribution network by providing an additional embedded generation connection to NPg.

5. Section 2 – **Establishing need** – establishes the investment drivers for the project, noting the strategic context and specific load drivers for this site. In this case, the Investment is driven by a contracted agreement to provide NPg with a 49.9MW connection for their Battery Energy Storage Solution (BESS).

6. Section 3 – **Optioneering** – summarises the options considered for addressing the established need and summarises the reasons for progressing the selected options to detailed analysis. For the Investment, 6 options were identified, one of which was taken forward for detailed analysis. This solution consists of building a new busbar within the existing site as it is the best value option for consumers enabling to deliver the connection with the required capacity by the agreed date.

7. Section 4 – **Detailed options analysis** – outlines the detailed comparative analysis undertaken in relation to each shortlisted option, with reference to key sensitivities applied and any key stakeholder input. For the Investment, following this detailed analysis, the preferred solution is to provide a connection to existing busbars via a spare bay, enabling NPG to construct their generation bay equipment.

8. Section 5 – **Deliverability, risk and regulatory outcome** – identifies delivery risks and mitigations, and the proposed regulatory mechanism to be attached to the Investment. In this case, given the project is advanced in delivery, only one identified risk remains: the need for additional NPg support which could lead to delays. This will be mitigated via close engagement with NPg.

9. Section 6 – **Conclusion** – confirms the proposed solution, including its key outputs, cost of XXXX (total cost) and direct allowance request of XXXX

10. Section 7 – **Overview of Assurance and Point of Contact** – confirms NGET's alignment of this submission with assurance requirements and the designated point of contact for this MSIP application.

Summary Table

MSIP Re-opener Application – Elland New 132kV NPG Bay	
Ofgem Scheme Reference/ Name of Scheme	Elland New 132kV NPg Bay
Primary Investment Driver	Northern Powergrid (NPg) connection agreement
Licence Mechanism/ Activity	Special Condition 3.14 Medium Sized Investment Projects Re-opener and Price Control Deliverable/ Clause 3.14.6 paragraph [f]
PCD Primary Output	Provide the busbar protection for new NPg circuit 132kV circuit at Elland 132kV substation by 21/07/2023.
Total Project Cost (£m)	XXXX
Funding Allowance Requested (£m)	XXXX
Output Delivery Year	2024
Reporting Table	Annual RRP – PCD Table
PCD Modification Process	Special Condition 3.14, Appendix 1

Issue Date	Issue No	Amendment Details
31st January 2024	1	First issue of document.

Summary Spend Phasing Table					
Regulatory Year	**2021/2022**	**2022/2023**	**2023/2024**	**2024/2025**	**2025/2026**
Spend £m	XXXX	XXXX	XXXX	XXXX	XXXX

1. Introduction

11. This document is the formal Medium Sized Investment Project (MSIP) submission to Ofgem by National Grid Electricity Transmission (NGET) for the Elland 132kV customer connection during RIIO-T2. NGET are seeking allowance for this connection via the MSIP reopener mechanism under Special Condition 3.14.6 paragraph (f): 'a system operability, constraint management or 0MW connection project or substation work, which is required to accommodate embedded generation, which in each case has been requested in writing by the System Operator'. The contract between NPg and ESO can be found in Appendix A.

12. The works described in this submission are required to provide a connection for a customer, Northern Powergrid (NPg), who is seeking a 132kV generation bay connection at Elland 132kV substation.

13. NPg have a signed connection agreement that specifies a connection date of 14/10/2023, NPg have since advised that they connected the asset on 22/01/2024.

14. This connection was not included in NGET's RIIO-T2 baseline plan as there was insufficient certainty around the investment requirements at the time. NPg commenced their connection modification application process in 04/2021 and the connection agreement was signed in 11/2021.

15. This connection is not covered by either the RIIO-T2 generation or demand uncertainty mechanisms (UMs). There is no contractual Transmission Entry Capacity (TEC) associated with the connection that could be used to quantify the output under the generation UM and there is no transformer required to facilitate the connection which could be used to measure output under the demand UM either. The primary function of this customer connection is to provide a generation connection to the local distribution network at the 132kV substation at Elland.

16. This submission seeks to demonstrate that the investment represents the best value option for consumers and is the only feasible option that can facilitate the capacity required by NPg by the connection date. The submission provides a comparison of capital costs of options but does not include a detailed cost benefit analysis (CBA). Given the limited options available, the relatively straightforward NGET Scope of Works required and project value; a CBA is not required to make an informed investment decision.

1.1 Geographical context

17. [redacted]

18. [redacted]. Figure 1 shows the location of Elland substation in the UK and with respect to Leeds, with a zoomed in aerial view of the 132kV elements identified.

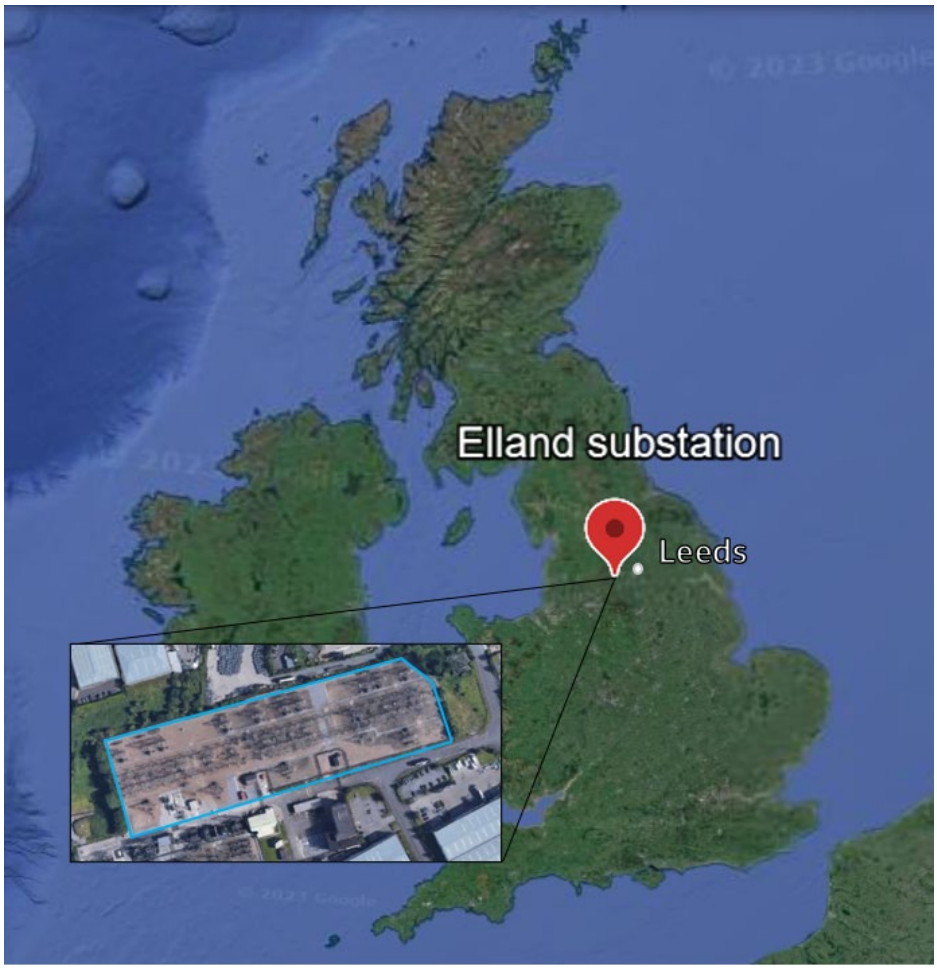


Figure 1 - Location of Elland 132kV substation in the UK

19. Figure 2 shows the location of Elland on the transmission system schematic.

Figure 2 – Location of Elland substation on the transmission network

20. Figure 3 depicts a simplified electrical layout of the 132kV substation, with the new circuit proposed.

Figure 3 – Single line schematic of Elland 132kV Substation with new circuit 'Lowfield Generation 1 BESS' circuit highlighted in pink.

1.2 MSIP Eligibility

21. This submission is made in accordance with the 'RIIO-2 Re-opener Guidance and Applications Requirements' published by Ofgem in February 2021. NGET are seeking allowance for this connection under Special Condition 3.14.6 paragraph (f): 'a system operability, constraint management or 0MW connection project or substation work, which is required to accommodate embedded generation, which in each case has been requested in writing by the System Operator'. This written request can be found in appendix A.

22. This connection is not covered by either the RIIO-T2 generation or demand uncertainty mechanisms (UMs). There is no contractual Transmission Entry Capacity (TEC) associated with the connection that could be used to quantify the output under the generation UM and there is no transformer required to facilitate the connection which could be used to measure output under the demand UM.

23. Primarily, the MSIP re-opener was introduced by Ofgem to allow Transmission Owners (TOs) to apply for funding for investments under £100m, not included in baseline funding and not eligible for funding via any other UM. Table 1 demonstrates how this proposal meets the remaining MSIP eligibility criteria.

Table 1 - MSIP eligibility checklist

Criteria	Criteria has been met.
Investment is not eligible for funding via the generation or demand Volume Driver Uncertainty Mechanism.	Yes
Investment sum < £100m not included in baseline funding.	Yes
Transmission investment	Yes

24. This project was first introduced to Ofgem on the XXXXXX as part of the monthly NGET/Ofgem MSIP meeting.

25. The contents of the submission have been informed by engagement between NGET and Ofgem with the aim of ensuring that this submission enables the Authority to make a positive and timely decision on funding.

1.3 Strategic context

26. The need for these works was triggered by a connection application made on 12/04/2021 by NPg for the provision of a new 132kV generator bay at the Elland 132kV substation.

27. NGET is required by our licence to provide connection offers to our customers. Our baseline RIIO-T2 business plan included the customer connections we had sufficient understanding of and certainty about at that time. Over the course of the price control period, it is expected that existing customers may change their plans or new customers may apply for connections that can require investment within the price control period. These changes are managed through the agreed uncertainty and reopener mechanisms.

28. The interconnections between the high voltage transmission network and the lower voltage distribution networks are provided by Super Grid Transformers (SGTs). In England and Wales, the transmission network generally consists of infrastructure operating at 275kV or 400kV. Substations that contain SGTs to provide connection to a distribution network are referred to as Grid Supply Points (GSPs). Generally, the low voltage side of the SGT will operate at 132kV, and the distribution DNO will be the owner of the 132kV substation to which the SGT is connected.

29. However, some GSPs, such as Elland, provide connections for more than one customer. In these cases, the 132kV substation is generally owned by NGET and treated as transmission infrastructure.

30. Traditionally, the connections between the transmission system and DNO networks were designed primarily to transfer power from the transmission network to distribution networks to supply the domestic and commercial customers connected to those networks. However, the growth in generation, often renewables, connected directly to distribution networks (referred to as embedded generation) has led to a greater need for BESS as well as to export power from the distribution network onto the transmission network. DNOs are now seeking greater flexibility from their connection to the transmission network with multi-directional power flows being common.

31. In response to the changing characteristics of both the distribution and transmission networks, DNOs are also seeking to reinforce their networks to meet these emerging customer needs. In this instance it has led to NPg seeking an additional circuit connection to the GSP. NPg is not seeking increased transfer capacity between the transmission and distribution network, however, is seeking to provide additional embedded generation connection within their own network.

32. The changing nature of DNO networks is a key part of the Net Zero transition and NGET works closely with DNOs to understand their future capacity and connection requirements to ensure that the rapid growth in embedded generation, and the flexibility these customers offer, can be accommodated.

2. Establishing the need

2.1 Customer Readiness and Reliability

33. The project is primarily driven by NPg's own need case, as the vast majority of the works are being delivered by NPg to connect the new Battery Energy Storage Solution (BESS). NPg has a signed connection agreement with the Electricity System Operator (ESO) (Appendix A).

34. Due to NGET owning the 132kV busbars at the Elland transmission substation, NGET are required to facilitate the final connection to the 132kV busbars, as well as carrying out minor busbar modification works to facilitate NPg's construction of a new 132kV bay underneath.

35. The works proposed are not dependent upon any wider scenario forecasts or outcomes. The needs case and stakeholder engagement section of this submission detail the current status of the customer's project, evidencing that there is a high degree of certainty the customers' project will progress and that it is independent of any other wider system developments.

36. Therefore, this submission does not present any analysis of wider scenario forecasting or outcomes as the contractual position and latest project status are the primary measures of need case certainty for this investment.

2.2 Load related drivers

37. NPg received an application for a 49.9MW BESS connection at [redacted] from a customer. Following their internal optioneering process, they concluded that they (NPg) could not provide a viable solution for this connection. The only viable identified Point of Connection (PoC) was proposed to be the 132kV busbar at Elland 275/132kV GSP as a direct connection. Given this substation belongs to NGET, NPg submitted a connection request to NGET to provide this solution.

NPg's need case

38. The following information from NPg regarding their needs case for this transmission project was sent via email on 28/02/2022 (by [redacted]) and the full details can be found in Appendix B.

[redacted]

NGET's need case.

39. NGET submitted a connection date offer for 14/10/2023 to NPg on 28/07/2021. NPg signed this offer on 14/11/2021. NGET is now obligated by our licence to provide a connection for this customer. NGET are required to complete works at Elland substation to ensure the NPg connection can be delivered. NGET cannot provide the connection without completing these works.

3. Optioneering Analysis

40. NGETs optioneering process is a rigorous and comprehensive methodology that considers all relevant factors to identify the best possible solutions for the needs of our customers. The process evaluates various options against a range of criteria, including cost, benefits, limitations, and technical feasibility. Our optioneering approach used to identify schemes is built on the knowledge gained from various areas of the business while operating as a Transmission Operator (TO).

41. Through this process, NGET creates a long list of potential options, which are then carefully analysed and evaluated to determine their viability and suitability. The optioneering process is designed to ensure that all relevant options are considered, and that the most appropriate solution is selected based on a thorough assessment of all available information. This approach enables NGET to make informed decisions that align with its strategic objectives and maximise value for our customers.

42. The following sections present a long list and shortlist of options which were considered reasonably suitable to providing a solution to the investment need. A full long list of all options examined can be found in Table 2.

3.1 Long list

43. NGET undertook a thorough optioneering study and identified a long list of 6 options that could provide a technical solution to the investment need outlined in this MSIP.

44. Our optioneering process fully adheres to the Ofgem Re-opener guidance and at a minimum includes the following options:

    A. Do nothing
    B. Whole system / market-based solution
    C. Use / enhancement of existing assets
    D. Construction of new assets

45. The optioneering study considered multiple scenarios to ensure the varying demand and support from local generation combinations were all accounted for.

46. NGET assessed the following options when identifying how to facilitate connections.

Table 2 - Long list of options

Option	Option Title	Option Description	Discounted / Taken Forward to Detailed Optioneering	Reason for discounting
1	Do Nothing	No connection to NPg.	Discounted	NGET is now contractually obligated to provide the connection.
2	Whole system / market-based solution	Reinforcement of existing connections to meet needs.	Discounted	No whole system or market-based alternative to providing a physical connection to the transmission network.
3	Use / enhancement of existing assets	Connecting on existing assets.	Discounted	There is no existing spare, populated bay which NPg can connect to
4	Loop-in option	Looping into the local 132 kV cable circuits	Discounted	More expensive and would compromise the quality of supply of existing customers through an increased likelihood of interruption and take significantly longer to deliver.
5	Construction of new assets via extension of the substation	Extend substation, provide busbar connection and protection equipment	Discounted	More expensive and would take longer.
6	Construction of new assets - within existing site	Provide busbar connection and protection equipment within existing site	Taken forward	Most cost-effective option to deliver the connection by the agreed date.

3.1.1 (Option 1) Do nothing – *Discounted.*

Option Description

47. Under this option, NGET would not facilitate connection to the BESS required by NPG. This would result in NPg not being able to connect the customer's BESS to the grid.

Limitations

48. This option is not applicable to this need case as NGET is now contractually obligated to provide a connection for the customer. There is no way to facilitate the customers application without providing some form of direct access to the transmission system.

3.1.2 (Option 2) Whole system / market-based – *Discounted.*

Option Description

49. This option explores the possibility of using a whole system or market-based solution to meet the customer's needs. This option is mostly used for reinforcements of existing options, rather than in the provision of new connections.

50. Looping into the local 132kV cable circuits as part of the internal optioneering process was another considered option.

Limitations

51. After an internal optioneering process, NPg concluded its inability to facilitate the 49.9MW BESS connection requested by the customer due to safety and land unavailability concerns. This led NPg to request a connection to the transmission network to NGET for the connection. NGET signed a connection offer. Therefore, a connection to the transmission network must be provided for this customer. There is no whole system or market-based alternative to providing a physical connection to the transmission network. The connection does not trigger any other works in the local transmission network (e.g., replacement of circuit breakers due to increased fault levels or increased circuit ratings to manage higher loadings). Therefore, no whole system or market-based solutions need to be investigated as alternatives to any infrastructure works required beyond the customer connection point.

3.1.3 (Option 3) Use / enhancement of existing assets – *Discounted.*

Option Description

52. NGET has investigated options to utilise existing assets at Elland substation to reduce the cost and timescales for 132kV Generation Connection. However, there is no existing spare, populated bay which NPg can connect to.

53. Where use of existing assets is possible to facilitate a connection, this is likely to result in lower costs and reduced timescales to facilitate a connection.

Limitations

54. It is not possible to utilise existing assets on the Elland substation as there is no existing spare bay which can be utilised to connect NPg. As such, this option is not feasible for delivering on the requirements to connect the customer as per their agreement.

3.1.4 (Option 4) Loop in – *Discounted.*

Option Description

55. Looping into the local 132kV cable circuits as part of the internal optioneering process was another considered option.

Limitations

56. However, following discussion with the customer, this was option was ruled infeasible. This was due to concerns around safety and reliability, cost, timescales to deliver and land constraint issues.

57. The loop-in connection would be considerably more expensive to deliver relative to the direct-from-bay connection. Furthermore, this option would compromise the quality of supply for existing customers through an increased likelihood of interruption and take significantly longer to deliver.

58. Proceeding with the loop-in would thus not have met NGET's obligation serve the customer's requirements to deliver the best value technically acceptable solution, where to be technically acceptable it must be safe, efficient and co-ordinated.

3.1.5 (Option 4) Construction of new assets & extension of the substation – *Discounted.*

Option Description

59. NGET has considered the option of new assets being constructed at Elland substation to provide the NPg connection. As there is no existing spare bay to connect to, the connection will require a new bay.

60. There is space for another bay, with existing civil structures and 132kV busbars as shown in Figure 4 as "New Bay Option 4", which was identified as appropriate for the new connection at Elland.

Figure 4 – Aerial view of Elland with depiction of possible new bays.

Benefits

61. The existing civil structures could be utilised by NPg for mounting switchgear and to form the basis for the new bay. This would reduce Ng's Scope of Works and provide efficiency savings for the customer in delivering their own work specifically.

Limitations

62. However, the use of the spare bay prompts the need to extend the substation boundary beyond its current position. Such an option would have been considerably more expensive and increased the programme duration due to the additional scope and associated planning permission requirements, thereby not meeting NPg's connection date (22/01/24). This option is referred to as No. 4 in Table 1.

63. Going with this option would add approximately 18 months to the programme as well as risk associated with gaining the required planning permission and associated consents. While this option would incur a cost reduction to NPg, this saving to the customer was not greater than the XXXX additional cost to NGET to justify this delay.

3.1.6 (Option 5) Construction of new assets within existing site – *Taken forward.*

Option Description

64. There was also space for a new bay where the busbars were already in place at the Elland 132kV substation. This bay is shown on Figure 4 as "New Bay Option 5". In following delivery of this option, NGET's works were limited to:

- XXXXXXXXXXXXXXXXXXXX
- XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

- [redacted]

Benefits

65. By utilising the existing busbars already in place at the substation, NGET can reduce the cost and timescales involved with delivering the connection, which helps to provide a better value solution for consumers.

Limitations

66. Compared to Option 5, Option 6 presents a slightly more costly solution for NPg who will not benefit from utilising the existing civils structures available within “New Bay Option 2”.

67. That said, given Option 5 is the other feasible solution to deliver the connection, NGET considers there are minimal limitations to the option of constructing new assets within the existing site.

68. Indeed, the cost savings available to NPg through Option 5 did not outweigh the significant increased cost that would be incurred by NGET on behalf of consumers to overcome the increased planning permissions needed to extend the substation boundary.

69. Option 6 presents a solution which is both quicker to deliver to meet the customers timescales, but also more cost efficient to deliver by using the existing busbars and preventing the need to extend the substation.

3.2 Short List

70. The short-listed option taken forward is outlined in the Table 3 below.

Table 3 - Short list

Option	Option Title	Option Description	Discounted / Taken Forward to Detailed Optioneering	Reason for discounting
6	Construction of new assets within the existing Elland substation site.	Provide busbar connection and protection equipment within the existing site	Taken forward to detailed optioneering	Most cost-effective option to deliver the connection by the agreed date.

3.3 Preferred Option

71. Following consideration of the feasibility, benefits and limitations of all 6 options. NGET decided to take forward Option 6 as its preferred solution to enable NPg’s connection at Elland.

72. As such, to enable the connection, NGET will provide a busbar connection and new busbar protection at the agreed location such that NPg can construct a new feeder bay. Indeed, the site has sufficient room for a new bay to be constructed for this purpose.

73. This option was chosen as the preferred option primarily in comparison with Option 5, which would have added cost to NGET due to the need to extend the substation boundary and overcome the associated planning permissions required. Thus, crucially it would have, from NGET's perspective, taken much longer to facilitate the new and represent a worse value solution for consumers and the customer.

3.4 Lifetime Cost Benefit Analysis

74. Our assessment of options in Section 3 of this document has sought to demonstrate why NGET determined that the preferred option to construct new assets within the existing site, offers the best value for consumers.

75. Given Ofgem's guidance to develop MSIP submissions that are proportional to the scale and cost of the investments proposed, NGET believes it is not considered necessary or beneficial to undertake a CBA process as part of this submission. Given the value of the Elland Investment and the reasoning behind the selection of the preferred option demonstrated above, it is considered to be clear that the preferred option represents the best value solution in the interest of consumers and the customer.

4. Detailed options analysis

76. This section explains the detailed analysis undertaken for the shortlisted option and explains the rationale for the proposed solution.

4.1 Minimum Technical Requirements

77. NPg's new generator bay does not provide a connection for a defined volume of embedded generation, nor does it increase the group demand level applicable at the Elland GSP. Therefore, the design standards for demand connections specified in chapter 3 of the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS) are not applicable when determining the electrical design of the new connection.

78. To meet the customer need for the provision of a new 132kV generator bay at Elland 132kV substation (ELLA1), a bay must be provided to facilitate the connection of the generator cable to the substation busbars. The switchgear that connects the circuit into the busbar (e.g., the circuit breaker and disconnector) are the responsibility of the customer, NPg.

79. NGET has studied the effect of adding an additional generator connection to the ELLA1 site. NPg have shared relevant data for NGET to study potential power flows and fault level infeed's. This is done to determine if the additional connection will trigger the need to upgrade any of the NGET owned assets at ELLA1 (or any other local NGET sites that may be affected by the new connection).

80. These studies concluded that the existing assets could accommodate the new circuit without the need for upgrades to improve capacity of fault level ratings.

4.2 Options analysis

81. The following option was considered for detailed analysis: -

    a. Option 6 - Provide busbar connection and protection equipment within existing site.

4.2.1 (Option 6) Construction of new assets and provide busbar connection and equipment within the existing site.

Option description

82. The preferred option is for NPg to construct a new bay within the existing compound at Elland 132kV substation, as there are no existing populated spare bays to utilise.

Intervention Works

83. To reduce the works associated with the connection, an existing busbar span has been identified as a suitable location for the new bay to be constructed. This reduces the requirement for additional works to be completed by NGET as per Option 5, providing efficiency and cost savings for the consumer. The Works area for the new 132kV Bay is shown in Figure 5.

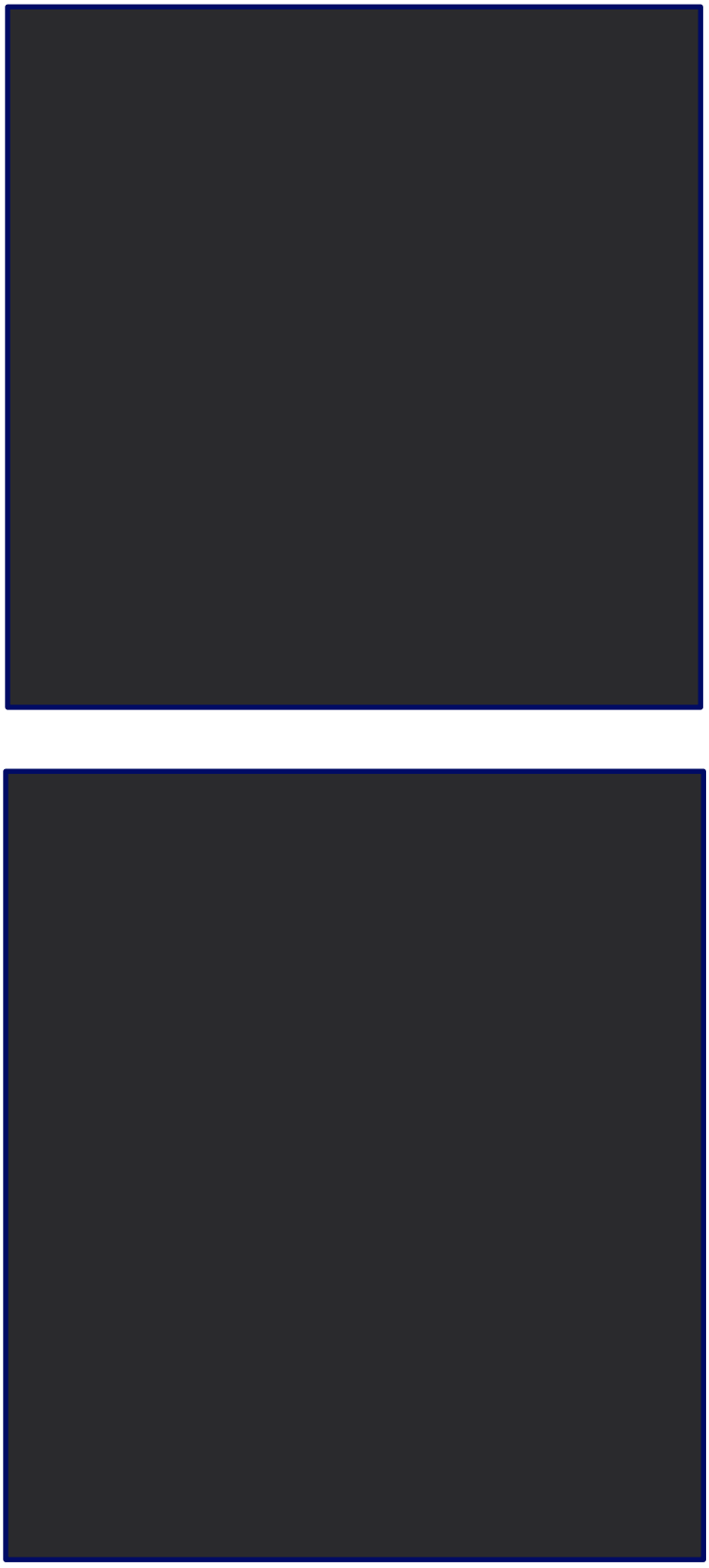


Figure 5 – Area for new Elland 132kV Bay

84. The majority of the works to provide the connection will be completed by NPg. NPg contractors will install a new generator cable, circuit breaker, disconnectors and associated ancillary, protection and civil works within the NGET Elland 132kV site.

85. NGET will install and commission a modification to the Busbar protection and related works. The modification involves the installation of a 'connection tail' to provide the physical connection for the NPg 132kV bay to the NGET 132kV busbar. An example is shown in Figure 6

Figure 6 - Connection Tail diagram

Work Summary

86. The works by NGET to facilitate the connection includes:

- NGET Infrastructure Works – The subject of this MSIP funding request
  - [redacted]
  - [redacted]
  - [redacted]

Benefits

87. This option met NPg's requested connection date, and by extension met their customer's BESS connection date. The option required minimal changes to NGET infrastructure, with the existing 132kV busbar system being utilised with localised modifications to facilitate connection of the new NPg bay.

Limitations

88. The limitations of this option were that NPg had to construct a new bay, including civil engineering infrastructure, negotiating existing cable assets in the process. However, NPg were happy to proceed on this basis as it allowed their connection to be available on time, with the build itself being relatively straightforward given the space available.

Volumes

89. The proposed volumes of work to connect at Elland 132kV substation is outlined in Table 4 below.

Table 4 - Volumes of Work

Asset/ Work	Volume
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XX

Cost

90. Total NGET project cost of this option is XXXXXXX in 18/19 price base.

4.3 Detailed costs

4.3.1 Introduction

91. This section provides a breakdown of the overall costs for Elland 132kV NPg New Bay including an expenditure profile for all Regulatory Years of delivery.

92. The following cost estimate breakdown represents our latest view of costs for the proposed investment and all costs are presented in 2018/19 price base, unless otherwise stated.

93. Appendix C Elland Cost Model submitted alongside this document provides a breakdown of the costs in more detail and should be reviewed alongside this chapter.

94. This Chapter is broken down into the following sections:

    4.3.2 Total Allowance Request

    4.3.3. Cost Estimate

    4.4.4. Cost Firmness

    4.4.5 Direct & CAI Split

    4.4.6 Detailed breakdown of Direct costs.

4.3.2 Total Allowance Request

95. Total project costs are XXXXX. NGET requests XXXXX allowance is provided through the MSIP reopener mechanism to recover the direct portion of costs and deliver works described above. The MSIP reopener mechanism is subject to the Opex escalator and therefore indirect costs will be funded under this route.

Table 5 - Allowance request – Cost Model tab reference 1.0

£	2022/23	2023/24	2024/25	Total (£)
Total Project Costs	XXXX	XXXX	XXXX	XXXX
Allowance Request (Direct Only)	XXXX	XXXX	XXXX	XXXX

4.3.3 Cost Estimate

96. The total cost to develop and deliver Elland 132kV NPg New Bay project is £0.18m including indirect costs and costs incurred to date.

97. Table 6 below shows a summary of total project costs.

Table 6 - Cost Summary – Cost Model tab reference 1.1

Element	Total (£)	Classification	Source
Contractor Costs			
Third Party Costs	XXXXX	Direct/CAI	Based on Purchase Orders

Element	Total (£)	Classification	Source
National Grid Costs			
Plant and Machinery procurement	XXXX	Direct	Based on actuals
ET Ops	XXXX	Direct	Estimated NG resource costs
Project Management	XXXX	CAI	
Project Services	XXXX	CAI	
Support Functions	XXXX	CAI	
Lands	-	Direct	
Consents	-	Direct	
Legal	XXXX	Direct	Based on Purchase Orders
NGET Portfolio Costs	XXXX	CAI	NGET internal estimate
Other			
Risk	XXXX	Direct	Risk Assessment
Total	XXXX		

98. Table 7 below shows a summary of total project costs phased annually.

Table 7 - Annual Phasing – Cost Model tab reference 1.1

Element	2021/22	2022/23	2023/24	Total (£)
Contractor Costs				
Third Party Costs		XXXX	XXXX	XXXX
National Grid Costs				
Plant and Machinery procurement		XXXX	XXXX	XXXX
ET Ops		XXXX	XXXX	XXXX
Project Management	XXXX	XXXX	XXXX	XXXX
Project Services			XXXX	XXXX
Support Functions		-	XXXX	XXXX
Lands		-	-	-
Consents		-	-	-
Legal		-	XXXX	XXXX
NGET Portfolio Costs			XXXX	XXXX
Other				

Element	2021/22	2022/23	2023/24	Total (£)
Risk	[redacted]	[redacted]	XXXX	XXXX
Total	XXXX	XXXX	XXXX	XXXX

4.3.4 Cost Firmness

99. Table 8 below shows the assessment of cost firmness using the classification outlined in the Ofgem LOTI reopener guidance document published on 29th March 2021. This shows that 70% of the total costs (firmness 1 and 2) are either incurred or have been contracted, giving high confidence in our cost submission.

Table 8 - Cost Firmness – Cost Model Tab reference 1.8

Cost Firmness	Total (£)	Notes
1 - Fixed	XXXX	Prior costs and 2023/24 actuals
2 - Agreed re-measurable		
3 - Agreed re-measurable future information	XXXX	Third party costs (with Purchase Order or contract)
4 - Estimated	XXXX	Risk and NG costs (less actuals)
5 - Early Estimate		
Total	XXXX	

100. Estimated costs relate to National Grid resource costs, calculated based on forecast days and standard rates, as well as risk for the remainder of the project.

4.3.5 Direct & CAI Split

101. Table 9 below provides the split between direct and indirect costs related to this project.

102. The costs of the Closely Associated Indirect (CAI) activities are incremental to the funding we received as part of our T2 baseline allowances. The T2 Baseline allowances for CAI activities were determined through Ofgem's regression (econometric) model, one of the key inputs being the baseline load and non-load capital allowances and as such no funding has been provided for this MSIP project. The costs are therefore in addition to the CAI allowances provided in T2 Final Determinations and should therefore be funded via the Opex Escalator mechanism.

103. The following table represents the split of Direct and CAI spend within this MSIP submission. The split is based on NGET's understanding of the definition of the scope of Closely Associated Indirects at the time of preparation (January 2024), and in particular the classification of those activities undertaken by contractors in the course of delivering assets.

104. NGET notes that work is ongoing between the TOs and Ofgem regarding application of the Opex Escalator mechanism and the definition of Indirect activities, and therefore this interpretation of CAI may be is subject to change. It is worth nothing that, should the Opex Escalator be applied by Ofgem to the January 2024 MSIPs in the same manner as it was applied by Ofgem to NGET's January 2022 MSIPs (in its decision of 6 October 2023) , it is unlikely that incurred CAI spend will be fully funded on all projects; we therefore believe that such under-funding should fall within the scope of the Opex Escalator True-up Mechanism currently being discussed with Ofgem.

Table 9 - CAI/Direct split – Cost Model Tab reference 1.8

Category	Total (£)	% of total
CAI	[redacted]	[redacted]
Direct	[redacted]	[redacted]
Total	[redacted]	[redacted]

4.3.6 Detailed Breakdown of Direct costs

105. The following sections discuss the component parts of the project's Direct costs.

4.3.6.1 Third Party Costs ([redacted])

106. The table below shows a summary of the main Third-Party direct costs required to deliver project Elland 132kV NPg New Bay.

[redacted] were awarded the contract under the 'Design and Project Services' framework agreement, using agreed framework rates. [redacted]

108. [redacted] [redacted].

109. [redacted]

Table 10 - Third party costs – Cost Model tab reference 1.2

Element	2022/23	2023/24	Total (£)
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

4.3.6.2 Direct Procurement ([redacted])

110. [redacted]

111. [redacted].

112. [redacted]

Table 11 - Direct procurement – Cost Model tab reference 1.6

Element	2022/23	2023/24	Total (£)
[redacted]	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

4.3.6.3 ET Operations, ([redacted])

113. This cost category relates to other NGET resource supporting the project's delivery as TO.

114. It is important to note that this table only shows additional ET operation costs that are required to be conducted by NGET in a business-as-usual manner on all projects. These costs are outside of the scope of the role being taken by NGET Asset Operations acting as principal contractor under Works Delivery.

Table 12 - ET operations cost summary - Cost Model tab reference 1.3.

Description	Total (£)
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
Total	[redacted]

115. The days and rates used to calculate these costs are shown in the Elland cost model.

4.3.6.4 Lands, Consents and Legal ([redacted])

116. The table below summarises the legal activities required to complete the Elland 132kV NPg New Bay project.

Table 13 - Lands Costs – Cost Model Tab reference 1.4

Description	Total (£)
[redacted]	[redacted]
Total	[redacted]

117. The interface agreement is required to provide NPG legal rights for locating assets on National Grid land, and vice versa.

4.3.6.5 Estimated Inflation

118. [redacted]

5. Deliverability, risk and regulatory outcome

119. This section will document the approach to delivery, list any potential deliverability constraints and any necessary mitigation strategies that will need to be undertaken to minimise the risk.

120. The output of this MSIP is to construct a new bay within the existing compound at Elland 132kV substation and provide a busbar connection and protection equipment.

5.1 Deliverability

121. A detailed project delivery plan has been prepared by the NGET scheme team. This plan facilitates the customer's contracted connection date of 24/10/2023.

122. The key project milestones are summarised below:

Table 14 - Key Project Milestones

Milestone	Date
Internal Committee Sanction	[redacted]
Contract Signed	[redacted]
Contract Awarded	[redacted]
Order Hardware	[redacted]
Secondary Design Complete	[redacted]
Primary Design Complete	[redacted]
Setting Issued to NG Assurance	[redacted]
Factory Acceptance Tests	[redacted]
First Site Access	[redacted]
Installation works Complete	[redacted]
Commissioning of New Busbar Protection Equipment	[redacted]
Available for Commercial Load	[redacted]
NPg energising	[redacted]

123. All NGET works were completed as per the project milestones given above.

124. NGET has worked closely with NPg to develop the project and agree a programme that meets their need to achieve the desired connection date. To ensure our investment is efficient, we have closely tracked the progress of the customer in developing their aspects of the connection to ensure that NGET does not invest ahead of need.

5.2 Procurement Strategy

125. A self-management delivery strategy for this project was selected as it was identified as being the most appropriate efficient approach for delivery for the customer within the required challenging project timescales. This delivery strategy has continued throughout the project.

126. In this model, Asset Operations undertook the Principal Contractor role, including project management, and administered the works [redacted]. [redacted]. Given the value and scale of this investment, a self-delivery approach had the benefit of providing an appropriate and timely solution to support delivery of the connection to customer requirements and efficiently in the interest of consumer value.

127. Individual external contractors were all appointed via existing frameworks in line with Utilities Contract Regulation (UCR) requirements [redacted]

5.3 Stakeholder engagement

128. Due to the relatively limited scope of works to be delivered by NGET, all of which were within the operational substation boundary, extended stakeholder engagement was not deemed a required of delivering this scheme effectively.

129. The only relevant stakeholders associated within the connection is the customer NPg. NGET continue to work closely with the customer in delivering the scheme such as with sharing technical data and with the ESO.

5.4 Risk & Mitigation

130. A risk management process has been adopted to set out a framework for managing reasonably foreseeable risks in a proactive, efficient approach that will not impede delivery of this project. This process is an iterative process and is reviewed on a regular basis to capture any new risks, update any existing risks and remove any risks that have materialised.

131. The project is almost at complete stage in delivery. As such, few key programme and project risks remain.

132. The remaining risk has been identified and incorporated into the analysis to produce the contingency provided within Table 15. The risk table only include risks above a threshold of XXX.

Table 15 - Extract from Risk Register (Values above XX) (2023/24 price base)

Cause	Description	Impact	Probability	Mitigation
XXXXXXX XXX XXXXXXX	XXX XXXXXX XXX XX XXXXXX XXXXX XXXX XXXXX XX XXX XX XXXXXXX	XXXXXXXX XXXXX	XXX	XXXXXX XXXXXX XXXX XXX XXXXXX XXXXXX XXXXX XXXX XXX XXXXXX XXXXXXX

5.5 Security for Consumers

133. Customers looking for a connection to the transmission system are signatories to the Connection and Use of System Code (the CUSC), which describes the associated rights and obligations. Customers contract directly with the ESO, who has an agreement with NGET covered by the SO-TO Code (STC).

134. One of the customer's obligations in the CUSC relates to the liabilities that are incurred if a customer terminates their connection agreement before the works are complete. These arrangements differ for generation and demand.

135. For demand, such as in this submission, customers' liabilities are based on the actual costs incurred and this is mirrored in the ESO's agreement with NGET. This means that should a demand customer terminate before the works are complete, the costs incurred to date will be recovered from the customer itself.

136. This arrangement means that the customer is prepared to make a financial commitment to the works being undertaken on their behalf and supports the need case for the investment.

5.6 Price Control Deliverables

137. As there is no measurable output in terms of contracted TEC or transformers to be delivered for this project, it is proposed that an evaluative Price Control Deliverable (PCD) is defined.

138. Provide the busbar protection for new NPg circuit 132kV circuit at Elland 132kV substation by 21/07/2023.

6. Conclusion

139. This document is the formal MSIP submission to Ofgem by NGET for the Elland 132kV substation customer connection during RIIO-T2. This is submitted under the MSIP re-opener provided for in Special Condition 3.14 of the NGET Transmission Licence.

140. This paper has demonstrated the need for investment at Elland 132kV substation (the 'Investment') and summarises the optioneering analysis that led us to our proposed solution. The following table summarises the main drivers for this Investment, the selected option, estimated costs and forecasted outputs.

Main drivers	Provide NPG with an embedded generation connection of 49.9MW
Selected Option	Provide a connection to existing busbars via a spare bay, enabling NPG to construct their generation bay equipment
Estimated Cost	XXXXXX (XXXXXXXX XXXXXXXXXXXXXXXXXXX
Outputs	NPG energising by 22/01/2024

7. Overview of assurance and point of contact.

141. Appendix D contains the assurance statement letter, that provides written confirmation in line with the assurance requirements set out in Ofgem's Re-opener Guidance and Application Requirements Document, dated 17th February 2023.

142. This confirmation is provided by the Head of Future Price Controls, Electricity Transmission where they are accountable for re-opener submission for National Grid Electricity Transmission (NGET) including any changes to these allowances. They provide the following statements below regarding how this MSIP application has been prepared and submitted in relation to each of the three assurance points requested by Ofgem:

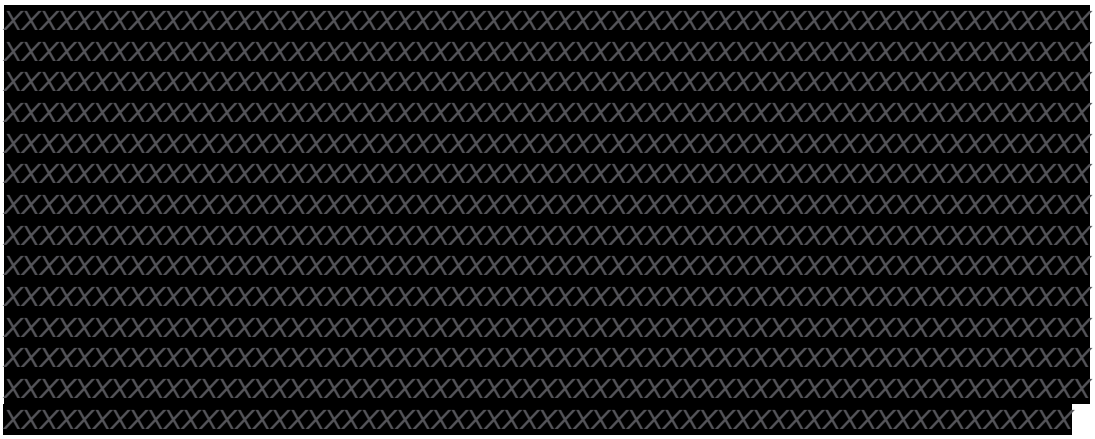
- It is accurate and robust, and that the proposed outcomes of the MSIP submission are financeable and represent best value for consumers. There are quality assurance processes in place to ensure the licensee has provided.
- high-quality information to enable Ofgem to make decisions which are in the interests of consumers.
- The application has been subject to internal governance arrangements and received sign off at an appropriate level within the licensee.

143. NGET's designated point of contact for this MSIP application is XXXX XXX, Regulatory Development Manager, email XXXXXXXXXXXXXXXXXXX, telephone XXXXXXXXXXXXX

8. Appendix

Appendix A Signed Final Contract NPg & ESO	Appendix A - Signed Final Contract_000042
Appendix B Extract from NPg Email r.e. Needs Case	As detailed below
Appendix C Elland Cost Model	MSIP%20Elland%20cost%20model.xlsx
Appendix D Assurance Statement Letter	APPENDIX D - Assurance Statement
Appendix E Reopener Guidance Checklist	APPENDIX E - Reopener Guidance -
Appendix F Direct Costs/ Asset Table	MSIPs%20Jan%2024%20Direct%20Costs%

Appendix B
Extract from NPG email r.e. Needs Case



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