MSIP Re-opener Report

WISD6 Extension - SEPD

January 2024

nationalgrid

Contents

Abbreviations

Table of Abbreviations

Abbreviation	Term
AIS	Air Insulated Switchgear
WISD6	Willesden
SEPD	Southern Electric Power Distribution
MW/MVA	megawatt / megavolt-amperes
ACTL	Acton Lane
GT	Grid Transformer
SF6	Sulphur Hexafluoride
MODAP	Modification Application
DNO	Distribution Network Operators
NGET	National Grid Electricity Transmission
RIIO	Revenue = Incentives + Innovation + Outputs
PASS	Plug-and-Switch System
MSIP	Medium Sized Investment Project
TO	Transmission Owner
GIS	Gas Insulated Switchgear
CBA	Cost Benefit Analysis
SSE	Scottish and Southern Electric
UKPN	UK Power Network
TNCC	Transmission Network Control Centre
ABCB	Air Blast Circuit Breakers
LOTI	Large Onshore Transmission Investments
NGESO	National Grid Electricity System Operator
CB	Circuit Breaker
ACL	Available for Commercial Load

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 investment at Willesden (WISD6) for a 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. The paper demonstrates the need for XXXX of which XXXX relates to direct costs. These costs are for investment at Willesden (WISD6) 66kV substation (the 'Investment') in the North of London to provide two additional 66kV connections for Southern Electric Power Distribution (SEPD) (the 'customer'), facilitating future data centre connections and supplying the local residential / commercial demand. This paper summarises the optioneering analysis that led us to the proposed solution; to utilise two Gas Insulated Switchgear (GIS) Plug-and-Switch System (PASS) units, enabling teed connections to the existing Grid Transformer (GT) 1 and 2 66kV bays.

3. This is a statutory requirement on the back of a connection application made by SEPD. 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 the Grid Transformer 2 / Wesley Avenue 2 circuit 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 papers relevant to this submission. For the Investment, this paper should be read in the context of significant energy demand growth within Greater London and regulatory obligation to provide connection to customers.

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 zero megawatt / megavolt-ampers (MW/MVA) connection at WISD6 for SEPD, required to accommodate the installation of SEPD's Wesley Avenue 1 and 2 upgrade works at Acton Lane (ACTL).

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, 9 options were identified, 2 of which were taken forward for detailed analysis due to their satisfaction with internal stakeholders and the customer as workable solutions:

    a. Option 6 – In-situ GIS Circuit Breaker and Isolator system

    b. Option 7 - In-situ GIS Disconnector system

7. **Section 4 – Detailed options analysis** – outlines the detailed comparative analysis undertaken in relation to each of the shortlisted option and a detailed cost analysis. For the Investment, following this detailed analysis, the preferred solution is to utilise two GIS Plug-

and-Switch System (PASS) units, enabling teed connections to the existing Grid Transformer (GT) 1 and 2 66kV bays.

8. This was chosen because the Sulpha Hexafluoride (SF6) PASS unit technology is a compact design that would fit within the tight site constraints at site, utilising the existing 66kV substation equipment.

9. **Section 5 – Deliverability, risk and regulatory outcome** – identifies the delivery plan, risks and mitigations, key stakeholder input, and the proposed regulatory mechanism to be attached to the Investment. The works have been sequenced and needed to commence from 05/04/2021 to facilitate a timely connection, avoid excessive constraint costs and significant delays. The proposed completion date for the works is 15/03/2023 within the RIIO-T2 period.

10. There is currently a Modification Application (ModApp) in progress with SEPD. This ModApp will see some future spend happening in the RIIO-T2 (2024) period due to customer delays and will be covered via a one-off cost by the customer.

11. **Section 6 – Conclusion – c**onfirms the proposed solution, including its key outputs, total project cost of XXXX (2018/19 price base) and direct allowance request of XXXX (2018/19 price base).

12. **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 – WISD6 Extension	
Ofgem Scheme Reference/ Name of Scheme	WISD6 Extension
Primary Investment Driver	Zero megawatt / megavolt-amperes (MW/MVA) connection at WISD6 for SEPD to enable them to take load off their Acton Lane (ACTL) circuits, diversify supply in and around the site.
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 two additional 66kV connections at Willesden (WISD6) 66kV substation teeing off the existing Grid Transformer 1 and 2 bays for Southern Electric Power Distribution (SEPD).
Total Project Cost (£m)	XXXX
Funding Allowance (£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 Spend £m	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**	**Total**
	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

1. Introduction

13. This document is the formal Medium Sized Investment Project (MSIP) submission to Ofgem by National Grid Electricity Transmission (NGET) for the Willesden (WISD6) customer connection extension in RIIO-T2. This is submitted under the Medium Sized Investment Project (MSIP) re-opener provided for in Special Condition 3.14.6 paragraph (f) of the NGET Transmission Licence: 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 Electricity System Operator (ESO). Further detail related to the eligibility of the Investment for this reopener mechanism is detailed later within this section.

14. The need for these works was triggered by the requirement for two demand connections at WISD6 66kV substation by SEPD, facilitating future data centre connections and supplying the local residential / commercial demand. It is NGET's responsibility to connect customers to the system and provide a stable network for the ever-increasing demand.

15. The works described in this submission are required to accommodate SEPD's Wesley Avenue 1 and 2 upgrade works at Acton Lane (ACTL). If these works are not carried out, SEPD would not be able to divert load off their ACTL connections and may limit future diversification works at the site.

16. This submission seeks to demonstrate that the preferred option chosen to deliver this connection represents the best value solution for consumers and meeting customer requirements.

1.1 Geographical context

17. [redacted]

Figure 1 – Location of the Willesden substation in relation to UK and London

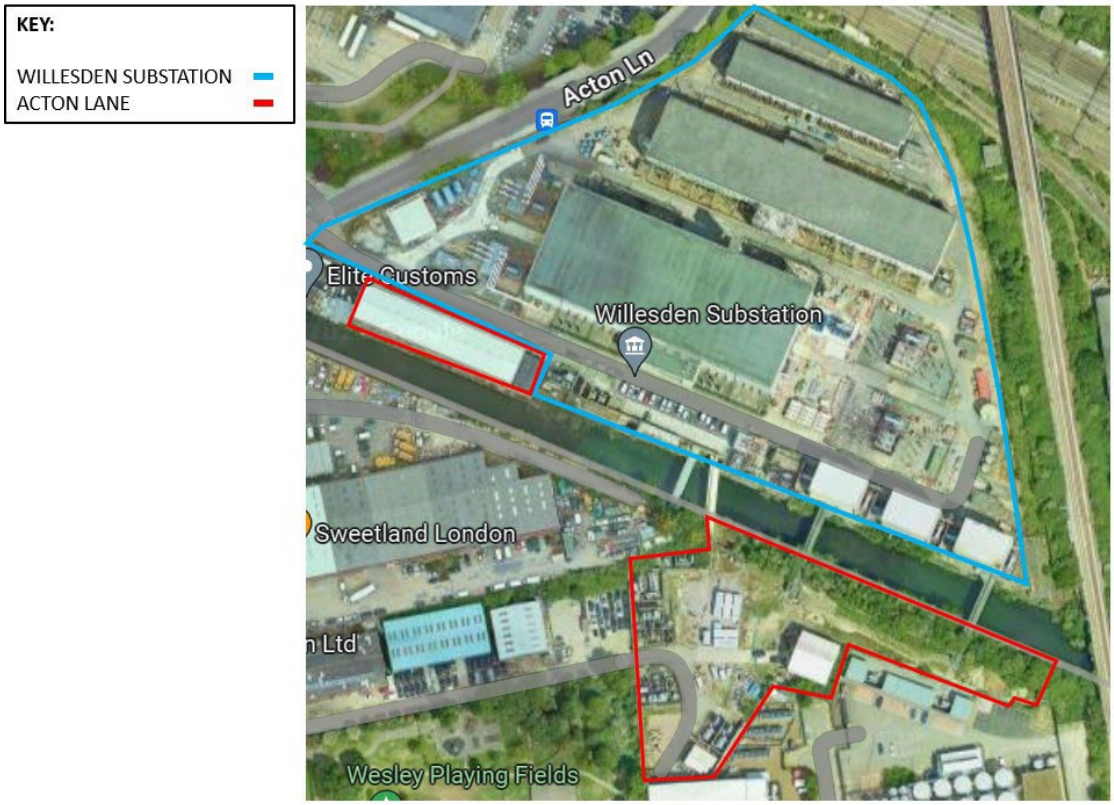

Figure 2 – Location of Willesden substation and Acton Lane

1.2 Existing Network Arrangements

18. There are currently multiple connections into the WISD6 substation across the range of network capacities. At the lower voltage of 66kV, the main distribution connections include Scottish Electricity Power Distribution (SEPD) and [redacted]. The connection associated with this MSIP submission will enable further diversification by the Distribution Network Operators (DNO).

19. The existing infrastructure at WISD6 66kV has capacity to accommodate the two teed connections for SEPD. To enable these connections, NGET requires, the modification of two existing single circuit bays to NGET Grid Transformers (GT) and converting them into teed circuits.

20. Willesden substation is one of the integral London sites and is seeing a significant influx of connections during the RIIO-T2 period. Figure 3 identifies where WISD6 is situated on the transmission system schematic, with interfacing system boundaries to the DNO networks and Kensal Green substation.

21. The substation is NGET owned, however the DNO's (SEPD and UKPN) own and operate assets within the substation footprint.

Figure 3 – Location of Willesden substation on the transmission network

1.3 MSIP Eligibility

22. This submission is made in accordance with the 'RIIO-2 Re-opener Guidance and Applications Requirements' published by Ofgem in February 2021. This MSIP specifically aligns to the sub-criteria of the Special Licence Condition 3.14.6 paragraph (f) which the WISD6 SEPD Investment is eligible for: '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 Electricity System Operator (ESO)'. A copy of the TOCO agreement with SEPD is available within (Appendix A).

23. This connection is not covered by either the RIIO-T2 generation or demand uncertainty mechanisms (UMs). Indeed, the WISD6 Extension does not include any assets for which output could be measured against under the demand Uncertainty Mechanism (UM).

24. Furthermore, the works within this report were not included within the NGET RIIO-T2 Baseline allowances as over the course of the price control period, further clarification of the reopener mechanism, Special Condition 3.14.6 paragraph (f) was sought from Ofgem.

25. This engagement was initially in respect of a different MSIP application (Microsoft customer connection). However, the outcome of this clarification identified that as per paragraph 4.23 of the 'RIIO-2 Final Determinations Electricity Transmission System Annex' NGET could utilise the MSIP reopener in respect of 0MW outputs to apply for funding for additional works associated with facilitating a demand connection which does not result in additional export capacity being created. This was confirmed via email on the 27/10/23 (Appendix B).

26. 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. However, Table 1 demonstrates how this proposal also 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

27. This MSIP was introduced to Ofgem on the XXXXXXXXXXXX as part of the monthly NGET/Ofgem MSIP meeting. Therefore, 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 timely decision on funding.

1.4 Strategic Context

28. Energy demand within Greater London is expected to increase by 172% by 2050, as the UK transitions to net zero.[1] Strategic network reinforcement in West London is necessary to accommodate this forecast growth in energy demand and supply imports. This issue has been highlighted by the Mayor of London as an urgent enabler for the 2030 Net Zero target for London.

29. Significant energy demand growth is associated with the development of several new IT data centres in West London. NGET has a statutory duty to provide additional substation capacity to meet this demand to maintain an efficient, co-ordinated system of electricity transmission. The provision of additional electricity capacity to these businesses will deliver substantial economic benefits. It is estimated that the amount of Gross Value Added (GVA) per new IT data centre is worth around £400m per annum to the UK economy.[2]

30. This is consistent with national policy objectives such as Build Back Better: Our Plan for Growth,[3] which stresses the importance of infrastructure delivery to the UK's economic prosperity and the need for infrastructure investment to drive economic growth and recovery following the global Covid-19 pandemic, boost productivity and enhance competitiveness.

31. While the two NGET Willesden substation enhancement MSIP submissions (SEPD and Microsoft) are independent from each other, these expansions reflect a whole site solution that recognises both strong energy demand growth and customer connection offers within West London, as well as the current asset health of the Willesden substation.

32. As a responsible transmission system operator, NGET recognises the importance of connecting customers to the grid to support the UK's decarbonisation efforts. While we are mandated to provide transmission connections upon request, we go beyond our regulatory obligations by proactively seeking ways to facilitate connections for both demand and supply customers.

33. This includes working collaboratively with industry stakeholders, the regulator, Distribution Network Operators (DNOs), and continuously improving our processes to increase the number of connected customers. At NGET, we remain committed to playing a leading role in supporting the UK's transition to a low-carbon economy, both locally, regionally, and nationally.

34. In this instance, the connection request is initiated by a demand customer (SEPD). The demand network is constantly changing and one of our key commitments is to remain flexible during this change. Our work under this reopener will ensure that this commitment continues to be met and will have a positive impact to the network.

1

[1] National Grid (2023), Electricity Ten Year Statement (ETYS); https://www.nationalgrideso.com/document/286591/download

[2] techUK (2020) The UK Data Centre Sector: The most important industry you've never heard of – Sector Overview (May 2020). Available from https://www.techuk.org/resource/uk-data-centre-sector-overview-2020.html [Accessed Dec 2023].

[3] HM Treasury (2021) Build Back Better: Our Plan for Growth (March 2021). Available from https://www.gov.uk/government/publications/build-back-better-our-plan-for-growth [Accessed December 2023].

2. Establishing the need

35. Providing a connection is a licence obligation for NGET, however, it also aligns to our overall strategy which, is centred around serving our customers and providing them with an efficient, effective and timely connection. As briefly mentioned within the introduction, the need for the works is to accommodate two new demand connections at the WISD6 66kV substation, as requested by SEPD.

2.1 Customer Readiness and Reliability

36. The investment proposed in this submission is driven by a single customer connection request for two demand connections. That customer has a contracted connection agreement and was awarded a contract to enable additional connections at WISD6 substation and diversification of supply.

37. 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.

38. These works are not dependent on any wider scenario forecasts or outcomes. The Stakeholder Engagement section details the status of the customer's project, evidencing that there is a high degree of certainty that this customer will connect regardless of any other wider system developments.

2.2 Load related driver

39. The Investment Driver for this MSIP is to facilitate two demand connections, required by SEPD at Willesden. SEPD's local demand has increased due to the connection of future data centre connections and increased local residential / commercial demand. NGET are required by licence to connect customers to the system and provide a stable network for ever-increasing demand.

40. The need for these works was triggered by the granting of additional connection contracts to the Customer. New customer connection projects are needed to guarantee the security of the network. SEPD require the connections to supply the new Wesley Avenue site, with their installation works taking place at Acton Lane. Willesden is one of the main London substations and these works are needed for strategic upgrades and to support future diversification at the site.

41. In response, we aim to deliver the additional two teed bay connections in the WISD6 66kV substation which enables a secure and efficient network for consumers. The solution enables the use of the existing bay infrastructure, whilst adding the additional circuits onto this – hence the 'teed' connection.

42. Following the option assessment process, the two teed Plug-and-Switch System PASS unit connections into the existing 66kV substation was identified as offering the greatest value for the consumer and this therefore formed the offer for SEPD. The subsequent formal application to connect these assets are the basis of the need case for the investment works proposed in this submission.

43. The primary criteria for success in this connection project is to provide the customer with a connection date at the earliest opportunity and at the best value option for consumers.

3. Optioneering

44. NGET's 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 and evaluate schemes is built on the knowledge gained from various areas of the business whilst operating as a Transmission Operator (TO).

45. This process creates a long list of potential options, which are then 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/viable solutions are taken forward for detailed assessment based on all available information. This approach enables NGET to present informed decisions to Ofgem, that align with strategic objectives of stakeholders and maximise value for customers.

46. The following section presents 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 options examined can be found in the table below.

3.1 Long List

47. NGET undertook a thorough optioneering study in the infancy stages of this investment (2015) and identified a long list of 8 options that could provide a technical solution to the problem outlined for this MSIP. Our optioneering process fully adheres to the Ofgem Re-opener guidance and includes the following options:

    A. Do nothing,

    B. Options that delay capital expenditure,

    C. Whole System / Market based flexibility options,

    D. Use / Enhancement of existing assets, and,

    E. Construction of new assets.

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

49. NGET assessed the following options – summarised in Table 2, when identifying how to facilitate connections.

Table 2 - Long list of options

Option	Option Title	Option Description	Est. Total Cost (£) in 18/19 price base	Est. Timescale	Short Listed	Discounted / Taken Forward to Detailed Optioneering	Reason for discounting
1	**Do Nothing**	NGET would not facilitate connection at WISD6 66kV substation.	N/A	N/A	N/A	Discounted	NGET is obligated to provide a connection for this customer. Therefore, a do-nothing option is discounted.
2	**Option to delay**	NGET would delay the agreed connection date at WISD6 66kV substation.	N/A	6 – 12 months	No	Discounted	NGET is obligated to provide a timely connection for this customer. Therefore, a delay in connection is not an option and thus discounted.
3	**Use of a spare bay and SEPD double bank two circuits onto UKPN's network**	NGET to use ac spare bay and SEPD double bank two circuits onto XXXX network.	N/A	12 - 18 months	No	Discounted	Option rejected by SEPD due to it possessing uncertain risks by banking onto XXXX circuit.
4	**In-situ Teed Connections**	Utilise existing assets at WISD6 66kV substation.	XXXX	12 - 18 months	No	Discounted	Rejected by TNCC and the Customer because of health and safety concerns.
5	**Offline GIS Build**	Extension of the existing 66 kV Air Insulated Switchgear (AIS) into a new GIS installation.	XXXX	36 months	Yes	Discounted	Rejected by the NGET committee due to the large infrastructure XXXXX cost that would not drive value for the customers connection or consumers.

Option	Option Title	Option Description	Est. Total Cost (£) in 18/19 price base	Est. Timescale	Short Listed	Discounted / Taken Forward to Detailed Optioneering	Reason for discounting
6	**In-situ GIS Circuit Breaker and Isolator system**	• Replace the existing Air Blast Circuit Breakers (ABCB) • Remove cable sealing ends, • Replace through wall bushings, • Protection and control modification, • Foundation modifications • Potential to replace cable to grid.	XXXX	8 – 12 months	Yes	Taken Forward	All internal stakeholders and the Customer are satisfied with the solution.
7	**In-situ GIS Disconnector system**	Similar to option 3, however in this option the existing ABCB is retained.	XXXX	10 – 14 months	No	Taken Forward	All internal stakeholders and the Customer are satisfied with the option as a workable solution.
8	**Use of 66kV Spare Bay**	Move demand off Acton Lane 22kV substation and onto the Willesden 132kV substation.	N/A	N/A	N/A	Discounted	This strategy could not be taken forward. XXXX have no future plans with regards to Acton Lane 22kV or Willesden 66kV substation.
9	**Offline AIS Build – Three remote switch compounds**	Construct three remote AIS switch compounds at Acton Lane.	N/A	12 – 18 months	No	Discounted	Rejected due to the scope of works and the requirement for a detailed design this option is highly unlikely to meet required Customer delivery milestone and likely to be costly solution with many risks.

*Timescales developed based on best estimates

50. The sub-sections below provide a summary of the options and the reasoning for either discounting or taking them forward for detailed options analysis.

51. The options below consider only the works required to facilitate SEPD's network reinforcement at WISD6 substation.

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

Option description

52. Under this option, NGET would not facilitate connection at WISD6 66kV substation.

Benefits

53. No capital spend or risk involved for the customer.

Limitations

54. NGET has studied the effect of adding the additional 66kV circuits onto the WISD6 66kV network, with the studies concluding that the existing assets couldn't accommodate the new circuits without the need to upgrade or improve the capacity fault level ratings. Therefore, to meet the customer needs case for the new 66kV circuits to be connected at WISD6 66kV substation, connections into the existing network busbars are required.

55. This option is not acceptable to this needs case as NGET is obligated to provide a connection for this customer. There is no way to facilitate the customer application without providing some form of direct access to the transmission system.

3.1.2 (Option 2) Option to delay - ***Discounted.***

Option description

56. This option seeks to understand if a delay to the connection could provide a short-term solution.

Benefits

57. No capital spend or risk involved for the customer. Potential for future solutions to become available that aren't currently an option.

Limitations

58. NGET has an obligation to connect the customer as per their agreement. The current contract connection date for the delivery of both circuits will see the completion date of 15/01/2023. To delay the project would jeopardise this contracted connection date and put NGET in breach of its obligation to the customer. Therefore, this option was discounted.

59. However, it is worth noting that SEPD have experienced delays with their portion of the connection works. The contract is currently being updated via a ModApp to capture this. Until this happens NGET must continue to work towards supporting the customer's current contracted date.

3.1.3 (Option 3) Use a spare bay and SEPD double bank two circuits onto UKPN's network - ***Discounted.***

Option description

60. This option explores the possibility of using a whole system / market-based solution to meet the customer's needs. In this case, the specific option explored the use of the NGET spare bay and for SEPD double bank onto XXXXX network. NGET worked and consulted with both the customer (SEPD) and XXXXX the feasibility of this option.

61. Following discussions it was determined that the allocation of the NGET spare bay in the WISD 66kV substation to SEPD would be suitable to provide one circuit, and for the remaining two feeds SEPD could double bank two circuits onto the XXXX network from Willesden 66kV to Bulwer 11kV substation.

Benefits

62. It is likely that this would provide a relatively low-cost option for the customer in a timely manner.

Limitations

63. Despite this offer, SEPD stated that the solution of banking onto XXXXX circuits poses uncertain risks with regards to the operability and control of the circuit. It was on this basis that SEPD rejected the option in the early development of the project.

64. This option would also see the customer (SEPD) interfacing with two parties for their connection, introducing various coordination risks and extensive requirements.

3.1.4 (Option 4) In-situ Teed Connections – ***Discounted.***

Option description

65. NGET has investigated the option to utilise existing assets at WISD6 66kV substation to reduce the cost and timescales for the SEPD connection. The proposed solution, as identified in Figure 4, explore banking the three new feeders with three Grid Transformers, providing drop down links connecting onto the cable sealing end to provide isolation.

Figure 4 – In-situ Teed Connections Option

Benefits

66. This option would see the utilisation of existing NGET infrastructure, reducing the cost for the customer and mitigating the works required to facilitate the connection. This would be reflected in the schedule for the construction.

Limitations

67. This option was formally offered to the customer; however, the option was strongly opposed to by the TNCC and the Customer on the basis of health and safety. This was because both parties stated that safety from the system could not be achieved with this option, so it would be impossible to issue safety instructions to the site engineer. NGET therefore decided to reject this option.

3.1.5 Construction of new assets

68. NGET has considered the option of constructing new assets to provide a connection for SEPD. In assessing this approach, NGET explored 3 different solutions under this option. A summary of Options 5, 6 and 7 are detailed below.

3.1.5.1 (Option 5) – Offline GIS Build – ***Discounted***.

Option description

69. Extension of the existing 66kV Air Insulated Switchgear (AIS) into a new GIS installation, as presented in Figure 5. Provides 3 new bays for the SEPD connection with the provision for 4 future bays and includes a new GIS bus coupler and a new GIS bay to connect 275/66kV Super Grid Transformer (SGT) 4A. The location of the new GIS compound is adjacent to the 66kV; however, the existing fence would require extension.

Benefits

70. Although a costly option, this would see an additional capacity generated for 4 new additional connections into WISD.

71. The works could be delivered offline and would therefore reduce the risks associated with outage and system access throughout the schedule.

Limitations

72. Option 5 was rejected by NGET's internal committee due to the large, estimated infrastructure cost XXXXXXXXXXXXX would be incurred. It was deemed that this cost would not represent the best value option in the interest of consumers.

73. Moreover, the solution would also require extensive civil works and modification to the operational perimeter, unlikely to be deliverable by the customers initial delivery milestone expectations.

74. At the time of optioneering, there wasn't a driver for additional connections into the WISD 66kV substation and therefore Option 5 would offer an over-and-above solution to connect the SEPD.

Figure 5 – Offline GIS Build Option

3.1.5.2 (Option 6) – In-situ GIS Circuit Breaker and Isolator System – ***Taken forward.***

Option description

75. The scope of this option is to replace the existing Air Blast Circuit Breakers (ABCB) and Through Wall Bushings, whilst removing the cable sealing ends. In addition to this, the existing protection and control systems would require modification, as well as the existing civils. The existing Grid Transformer cable may be subject to replacement pending studies.

76. This option combines 132kV GIS units fitted into the constrained space on the existing WISD 66kV bays. The illustration below (Figure 6) demonstrates that multiple GIS units are able to be fitted into an existing bay footprint.

Benefits

77. By replacing the Circuit Breaker (CB), the long outage required to maintain the existing ABCB is prevented. Maintenance of the GIS CB is likely to be short.

78. This approach has the efficient outcome of replacement the circuit breakers already at the end of their life (Asset Health have advised that CBs have an asset replacement priority of XXXX years). Therefore, an additional project to deliver the replacement of this asset would not be required and the works could be embedded within these works.

79. All internal stakeholders and the Customer are satisfied with the solution.

80. GIS units are able to be fitted into an existing bay footprint without the need for modification works.

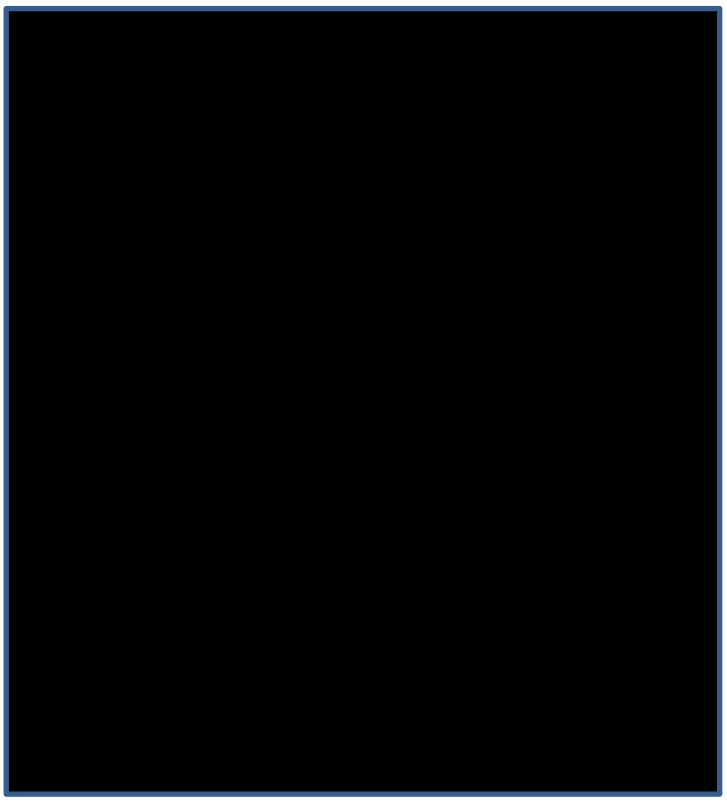

Figure 6 – In-situ GIS Circuit Breaker and Isolator system Option

Limitations

81. The option utilises SF6 which is known to have environmental implications.

82. Option 6 proposes to use GIS switchgears, rather than SF6 free GIS switchgears, for the following reasons:

83. SF6 free GIS switchgear technology at the time of optioneering XXXX was too nascent. The development of the switchgears was prior to the industry wide adoption that would provide valuable feedback on installation and use. The customer requested connection date is tight and doesn't permit any delays, therefore, NGET made the decision to use an established technology that provided less risks.

3.1.5.3 (Option 7) – In-situ GIS Disconnector System – ***Taken forward.***

Option description

84. Like option 6, however in this option the existing ABCB is retained. Again, this option combines 132kV GIS units, as shown in the illustration below (Figure 7), with the multiple GIS units required able to fit into the constrained space.

Benefits

85. All internal stakeholders and the Customer are satisfied with the option as a workable solution.

86. GIS units are able to be fitted into an existing bay footprint without the need for modification works.

Limitations

87. The option utilises SF6 which is known to have environmental implications.

88. Option 7 proposes to use GIS switchgears, rather than SF6 free GIS switchgears, for the following reasons:

89. SF6 free GIS switchgear technology at the time of optioneering XXXX was too nascent. The development of the switchgears was prior to the industry wide adoption that would provide valuable feedback on installation and use. The customer requested connection date is tight and doesn't permit any delays, therefore, NGET made the decision to use an established technology that provided less risks.

90. Therefore, the proposed option provides the customer with a low-risk and cost-effective solution that would allow NGET to meet the customer connection date.

91. Retaining the existing ABCB will require additional maintenance during the outage, this extending the schedule to deliver the works. The ABCB is also due for asset replacement which would be required following the completion of the customer connection.

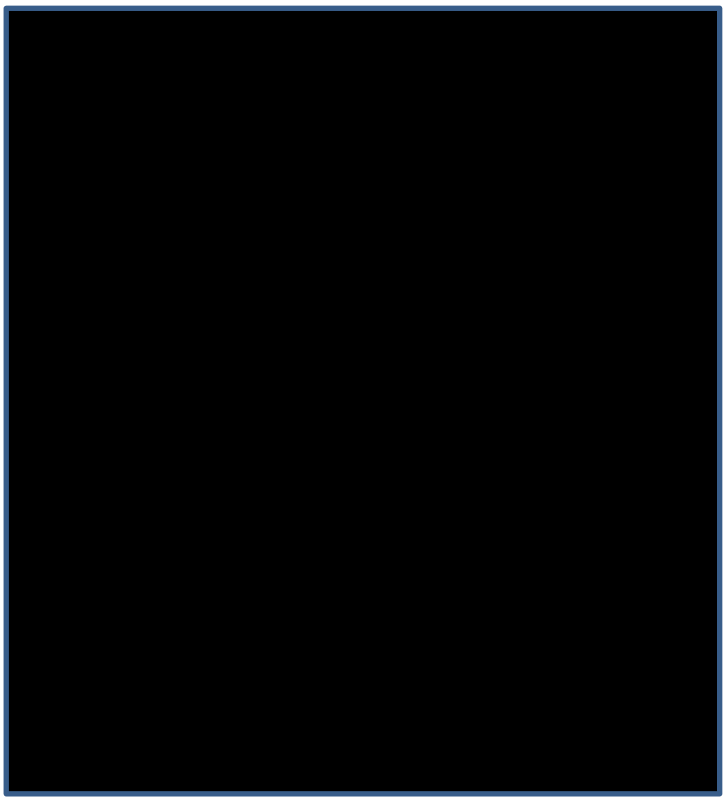

Figure 7 – In-situ Disconnector system Option

3.1.5.4 (Option 8) – Use of 66kV Spare Bay - ***Discounted.***

Option description

92. This strategy proposes to start moving demand off Acton Lane 22kV substation and onto the Willesden 132kV substation. This would leave only SEPD demand on the Acton Lane bars. This would give NGET confidence that a fourth 275/66kV transformer will not be needed in the long-term.

93. The current bay planned for the fourth 275/66kV SGT would then be given to SEPD for the first of their three new feeder bays from the 66kV substation at Willesden. A programme of transfer would then be drawn up with SEPD to enable the transfer of remaining load from Acton Lane to Willesden 66kV substation to allow NGET to free up existing 66/22kV transformers to provide the bays to SEPD for their remaining two feeder bays.

Benefits

94. Significant enabling works to facilitate this option, accompanied by an extensive duration that would be unlikely to achieve the customer anticipated milestone dates.

Limitations

95. This strategy could not be taken forward following discussions XXXXXXX that concluded they have no future plans with regards to Acton Lane 22kV or Willesden 66kV substation. They also indicated that if SEPD come off the 22kV substation then XXXXX would be content to take ownership of the substation as they would become the sole user.

3.1.5.5 (Option 9) – Offline AIS Build – Three remote switch compounds – ***Discounted.***

Option description

96. This option is to construct three remote AIS switch compounds at Acton Lane, illustrated in Figure 8 that would include:

    a. replacing the existing cable from the 66kV substation to the new compound,

    b. installing new disconnectors,

    c. conducting major civil works – the identified location for the compound contains several cable crossings and further unknown cables and

    d. conducting extensive surveys to understand the ground condition and verify if this option is feasible to construct.

Benefits

97. The works could be delivered offline and would therefore reduce the risks associated with outage and system access throughout the schedule.

Limitations

98. Given the scope of works and the requirement for a detailed design before determining feasibility, this option involved significant risks from the offset before and was therefore rejected.

99. In addition to this, the option is unlikely to meet the customers expected delivery milestones as well as being a costly solution for the connection.

Figure 8 – Offline AIS Build – Three remote switch compounds

3.2 Short List

100. When assessing the options listed above, NGET considered that the only feasible options were:

a. Option 6 - In-situ GIS Circuit Breaker and isolator system

b. Option 7 - In-situ Disconnector system

4. Detailed Option Analysis

101. When assessing the options listed above, NGET considered that the only feasible options were Option 6 and Option 7, as outlined in Table 3 below:

Table 3 – Shortlisted Option Summary

No.	Option	Est. Total Cost (£) in 18/19 price base	Timescale	Selected	High-level Justification
6	**In-situ GIS Circuit Breaker and isolator system**	XXXX	8 – 12 months	Yes	• Acceptable approach to all stakeholders. • Efficient approach including the replacement of ABCB that had passed its asset lifecycle. • Duration of outage can be reduced by mitigating the maintenance requirements in the ABCB during the installation works. • Installation anticipated to be faster than Option 7, delivering the customer's connection sooner.
7	**In-situ Disconnector system**	XXXX	10 – 14 months	No	• Utilising the existing ABCB will extend the programme duration due to maintenance requirements. • Replacement of the ABCB would be required in the near future post commissioning of the new connection. • This additional future replacement would be subject to outage and further works, being an inefficient way of delivering the works as it can be done in parallel with the customer connection.

102. Following thorough analysis, NGET considers the best available option is Option 6: construction of new assets via In-situ GIS Circuit Breaker and Isolator system. This option was further developed through detailed design and consisted of utilising two GIS PASS units, enabling teed connections to the existing GT1 and GT2 66kV bays. The SF6 PASS unit technology is a compact design that would fit within the tight site constraints, whilst utilising the existing 66kV substation infrastructure. This option also preserved the little remaining space throughout the site to potentially facilitate future connections.

103. This option is deemed more viable than Option 7 as it prevents future rework in the bay, without incurring early asset write off, for the ABCB. This mitigating spends on the network, as well as reducing the risks associated with undertaking this ABCB replacement following the completion of this project (i.e., obtaining system access, etc.).

Figure 9 – Location of GT1 and GT2 Teed Connection bays at Willesden substation.

4.1 Detailed Option Analysis

104. The *In-situ GIS Circuit Breaker and Isolator system* (Option 6) was selected as the preferred option. This option provides the most holistic approach based on minimising cost and providing a compliant solution that achieves the connection date for the customer.

105. The proposed works is to utilise two GIS PASS units, enabling teed connections to the existing GT1 and GT2 66kV bays. This was chosen because the SF6 PASS unit technology is a compact design that would fit within the tight site constraints, and therefore, utilising the existing 66kV substation equipment.

106. The proposed layouts for the works are set out in Figure 10 below.

107. In addition to the above, there was a requirement to undertake civil works, including the removal and installation of a new foundation for the GIS units, to facilitate the connection that was facilitated by XXXXXXXXXXXXXXXXXX

Figure 10 – Proposed layout of GT1 and GT2 Teed Connection bays at Willesden substation.

4.2 Lifetime Cost Benefit Analysis

108. The preferred solution detailed above was evidenced to represent the best value option that can satisfy the customer's need. The submission provides a comparison of capital costs of options but does not include a detailed cost benefit analysis (CBA). A CBA is not required to make an informed investment decision in this circumstance as the optioneering assessment concluded Option 6 to be the more viable solution, preventing future rework in the bay without incurring early asset write off for the ABCB. This is reflective of Ofgem's guidance which requests for submissions to be proportional to scale and cost of the investments proposed but does not obligate a CBA if it fails to add sufficient value to the submission.

4.3 Detailed costs

4.3.1 Introduction

109. This section provides a breakdown of the overall costs for WISD6 Extension, including an expenditure profile for all Regulatory Years of delivery.

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

111. Appendix C - Willesden SEPD Cost Model submitted alongside this document provides a breakdown of the costs in more detail and should be reviewed alongside this chapter.

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

4.3.2 Total Allowance Request
4.3.3 Cost Estimate
4.3.4 Cost Firmness
4.3.5 Direct & Closely Associated Indirect (CAI)
4.3.6 Detailed breakdown of Direct costs.

4.3.2 Total Allowance Request

113. Total project costs are XXXX. NGET requests that XXXX 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.

	2020/21	2021/22	2022/23	2023/24	2024/25	Total (£)
Total project costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Allowance request - Direct only*	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Table 4 – Allowance request – Cost Model tab reference 1.0

4.3.3 Cost Estimate

114. The total cost to develop and deliver WISD6 Extension project is XXXX including indirect costs and costs incurred to date. The *Table 5* below shows a summary of costs.

Element	Total (£)	CAI/Direct	Source
Contractor Costs			
Main Works Contractor	XXXX	Direct/CAI	Tendered
Third Party Costs	XXXX	Direct	Based on Purchase Orders
National Grid Costs			
ET Ops	XXXX	Direct	Estimated NG resource costs
Project Management	XXXX	CAI	
Project Services	XXXX	CAI	
Support Functions	-	CAI	
Lands	-	Direct	
Consents	-	Direct	
Legal	XXXX	Direct	Based on Purchase Orders
NGET Portfolio Costs	XXXX	CAI	NG internal estimate
Other			
Risk	XXXX	Direct	Risk Assessment
Payment from customer	XXXX	Direct/CAI	
Total	XXXX		

Table 5 – Cost Summary – Cost Model tab reference 1.1

115. Of the costs stated above, it is important to note that a proportion of these costs totalling XXXX (XXXX in 2022/23 price base) have been recovered from SEPD via the One-off Cost mechanism under the contract. These costs are subject to the customers delayed installation works and have been included within the total project spend and subsequently the payment has been deducted from project costs in the 'Payment from customer' line. The payment has been deducted from total Direct and Indirect costs as appropriate. These costs are outlined in *Table 6* below – SEPD One-off Costs.

116. The remaining connection works due to take place on the GT1 circuit, also delayed by the customers installation, are yet to be costed and will be recovered via the customer.

Subject	22/23 price base (£)	18/19 price base (£)
XXXXXXXXXXXX	XXXX	XXXX
XXXXXXXXXXXXXXXXXX	XXXX	XXXX
XXXXXXXXXX	XXXX	XXXX
XXXXXXXXXXXXXXXXX	XXXX	XXXX
XXXXXXXXXXXX	XXXX	XXXX
XXXXXXXXXXXXXXX	XXXX	XXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXX	XXXX
Total:	XXXX	XXXX

Table 6 – SEPD One-off Costs

117. The table (Table 7) below shows the annual phasing of costs.

Element	2020/21	2021/22	2022/23	2023/24	2024/25	Total (£)
Contractor Costs						
Main Works Contractor	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Third Party Costs	XXXX	XXXX	XXXX	XXXX	-	2,069,970
National Grid Costs						
ET Ops	-	XXXX	XXXX	XXXX	XXXX	XXXX
Project Management	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Project Services	-	-	-	XXXX	-	XXXX
Support Functions	-	-	-	-	-	-
Lands	-	-	-	-	-	-
Consents	-	-	-	-	-	-
Legal	-	-	XXXX	XXXX	-	XXXX
NGET Portfolio Costs	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Other						
Risk	-	-	-	XXXX	-	XXXX
Payment from customer	-	-	-	-	XXXX	XXXX
Total	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

Table 7 – Annual Phasing – Cost Model tab reference 1.0

4.3.4 Cost Firmness

118. *Table 8* below shows the assessment of cost firmness using the classification outlined in the Ofgem Large Onshore Transmission Investment (LOTI) reopener guidance document published on 29th March 2021. This shows that XXX of the total costs are either incurred or have been contracted (Cost firmness category 1 and 2), giving high confidence in our cost submission.

Cost Firmness	Total (£)	Notes
1 - Fixed	XXXX	Prior costs and 2023/24 actuals
2 - Agreed remeasurable	XXXX	Future Contractor and customer funding
3 - Agreed remeasurable future information	XXXX	Third party future costs (with PO or contract)
4 - Estimated	XXXX	Risk and NG costs
5 - Early Estimate		
Total	XXXX	

Table 8 – Cost Firmness – Cost Model Tab reference 1.8

119. The remaining estimated costs are predominately related to staff forecast costs. This is calculated using the forecast days and standard rates; these forecast days for staff have been based on the actuals bookings that occurred on the first circuit.

4.3.5 Direct & CAI Split

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

121. 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 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 there be funded via the Opex Escalator mechanism.

122. 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.

123. 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.

Category	Total (£)	% of total
CAI	XXXX	XXXX
Direct	XXXX	XXXX
Total	XXXX	XXXX

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

4.3.6 Detailed Breakdown of Direct costs

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

4.3.6.1 Main Works Contract [redacted]

125. Main Works Contract are comprised of [redacted] of Direct costs and [redacted] of Closely Associated Indirect costs.

126. Following a competitive tender, the detailed scope to facilitate this connection was contracted to [redacted]

127. *Table 10* below shows a summary of Direct main works contractor costs required to deliver the WISD6 Extension project.

128. The key activities are:

a. [redacted]

b. [redacted]

c. [redacted]

129. The majority of the spend has occurred on this project as the bulk of the works associated have been completed. The first circuit (GT2) is now energised and hence the costs have been incurred, with the second connection (GT1) nearing completion.

130. [redacted]

131. [redacted]

Cost Code	Scope	2023/24 price base (£)	2018/19 price base (£)
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	Total Lump Sum	[redacted]	[redacted]

Table 10 – Direct Main Works Contractor Breakdown - Cost Model tab reference 1.2

4.3.6.2 Third Party Costs [redacted]

132. *Table 11* below show a summary of the main third-party direct costs required to deliver WISD6 Extension project.

133. [redacted]

134. As above, the majority of the spend has occurred on this project as the bulk of the works associated have been completed.

Element	2021/22	2022/23	2023/24	Total (£)
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	0	[redacted]	[redacted]	[redacted]
[redacted]	0	[redacted]	[redacted]	[redacted]
[redacted]	0	0	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]	[redacted]

Table 11 – Third party costs – Cost Model tab reference 1.3

135. The key activities are:

a. [redacted] – the costs associated with the civils elements of the works. [redacted]

b. [redacted] – the costs associated with providing design assurance for the works, guaranteeing a compliant connection and making sure the relevant technical standards are achieved.

c. [redacted] – the costs associated with providing quality assurance for the works, [redacted] to guarantee a compliant connection and making sure the relevant technical standards are achieved.

4.3.6.3 ET Operations [redacted]

136. This cost category relates to NGET's forecast in-house resource supporting the project's delivery, as seen in *Table 12* below.

Description	Total (£)
[redacted]	[redacted]

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

Table 12 – ET operations cost summary - Cost Model tab reference 1.4.

137. The days and rates used to calculate these costs are shown in the Willesden SEPD Cost Model.

4.3.6.4 Lands, Consents and Legal [redacted]

138. *Table 13* below summaries the types of legal activities required to complete the WISD6 Extension project.

139. This is part of the one-off works requested by the customer for NGET to facilitate. As part of this, the standard charge was used to cover legal fees associated with developing this document.

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

Table 13 – Legal Costs – Cost Model Tab reference 1.5

140. This interface agreement is required to cover the legal aspects associated with owning assets on NGET property.

4.3.6.5 Estimated Inflation

141. [redacted]

5. Deliverability, risk and regulatory outcome

142. 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.

5.1 Deliverability

143. NGET has proactively engaged with contractors to ensure that the customer's connection timescales can be met. A collaborative programme was developed with the customer, which considers pre-works commencement mitigation measures to maintain deliverability within the customer's required timescales.

144. Notably, we have continued to deliver against the historical milestones alongside the customer, and therefore do not have any legacy delays coming into this project. Our team is committed to ensuring that the project stays on track and that customer connections are completed as scheduled. NGET will seek to deliver the delayed customer works (currently being assessed via a Modification Application at the earliest possible opportunity.

145. There are interface works included within this project that will see the customer and NGET having to deliver in a coordinated manner. This has been completed to date, seeing the first of the customer circuits energised in early 2023. This approach will be continued into 2024 that will see the second circuit energised.

146. The technology being utilised not only fits within the existing constraints of the WISD6 66kV substation, but also enables the bulk of the equipment to be pre-assembled offsite expediting the installation and project delivery. Although there are environmental factors associated with the use of SF6 GIS equipment, the use of this equipment was the only feasible, best whole value solution to providing this connection to the customer. GIS in this case refers to the older technology, which still includes SF6, rather than the new technology that has removed it.

147. The selection of the innovative technology for this connection inevitably had minor unfamiliarity issues in the early project phases, when delivering the first circuit. However, the lessons taken from the first connection were implemented in the second connection, seeing the delivery in a timelier manner.

5.2 Procurement Strategy

148. [redacted]

149. [redacted]

Table 4 – Legal Costs – Cost Model Tab reference 1.5

Contractor	Price (Gate 2)	[redacted]	[redacted]	Total %
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

150. [redacted]

151. The procurement for this project is scoped to provide the following:

- [redacted]
- [redacted]
- [redacted].
- [redacted].
- [redacted]

5.3 Work undertaken in RIIO-T2

152. To date, the following works have been completed within the RIIO-T2 period for this connection:

- All works associated NGET and SEPD with the connection of GT2 circuit.
- Installation of the GT1 PASS unit and bay replacement equipment.
- Installation of the GT1 associated civils works.
- Installation of the GT1 protection and control works.
- Termination of the GT1 cables.
- Installation of the associated metering panels for GT1.

153. The works outstanding to be complete in the RIIO-T2 period includes:

- Stage 1 and Stage 2 Commissioning of the GT1 assets.
- Termination of the SEPD cable into the PASS unit.

5.4 Project Plan

154. A detailed project delivery plan has been prepared by the NGET scheme team. This plan facilitates the customer's contracted connection date of 30th November 2024 (estimate based on ModApp timelines).

155. The key project milestones are summarised in Table 15 below:

Table 5 – Key Project Milestones

Milestone	Date
Sanction	XXXXXXXX
Contract Signed	XXXXXXXX
Contract Awarded	XXXXXXXX
First Site Access	XXXXXXXX
Stage 1 (GT2) ACL	XXXXXXXX
Stage 2 (GT1) ACL	XXXXXXXX

[1] *Latest customer contract*

[2] *MODAP in progress to change this date, anticipated November 2024*

5.5 Risks and Mitigations

156. 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.

157. Initially, a total contingency of XXXX was required for the project, with the following key programme and project risks contributing towards this value. However, as the project has progressed, the risks have materialised and the total contingency remaining on this project is XXXX in 18/19 price base (XXXX in 2023/24 price base) identified in Table 17.The full list of risks can be found within project the risk register within the cost model (Appendix C) tab 4.1.

Table 6 – Extract of Highest probability Remaining Project Risks – Cost Model Tab 4.1

Cause	Description	Impact	Probability pre-mitigation	Mitigation	Residual Probability post mitigation	Cont. Value (23/24 price base)
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

5.6 Stakeholder Engagement

158. The key stakeholders identified by NGET in this project are: SEPD (the customer) and NGESO.

159. NGET has worked closely with the SEPD, sharing technical data, developing options and agreeing a programme that meets the customers need to achieve this connection as early as possible. To ensure our investment is efficient, we have closely tracked the progress of the customer in developing their aspects of the connection.

160. The latest status of the SEPD project is as follows:

- GT2 successfully energised in February 2023, after this part of the project was delayed by the customer due to installation issues.
- GT1 installation works are complete, with just the commissioning of the assets to be complete. Note, the customer has also experienced installation delays with this circuit and is yet to formulise the energisation date with NGET, following a ModApp. It is anticipated that the remainder of these woks will be complete in 2024. NGESO are currently involved in the ModApp process and will look to formalise the submission of this with SEPD, before passing onto NGET.

5.7 Security for Consumers

161. 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).

162. 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.

163. 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.

4. 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.

5.8 Price Control Deliverables

164. As there is no measurable output in terms of contracted Transmission Entry Capacity (TEC) or transformers to be delivered for this project, it is proposed than an evaluative Price Control Deliverable is defined.

165. Provide two additional 66kV connections at Willesden (WISD6) 66kV substation teeing off the existing Grid Transformer 1 and 2 bays for Southern Electric Power Distribution (SEPD).

6. Conclusion

166. This document is the formal MSIP submission to Ofgem by NGET for the WISD6 Extension in Willesden during RIIO T2. This is submitted under the MSIP re-opener provided for in special condition 3.14 of the NGET Transmission Licence.

167. Throughout the paper, the need for investment at Willesden has been demonstrated with the optioneering methodology that has led the preferred option. The table below summarises main drivers for the investment, the selected option, estimated costs and forecasted outputs.

Main Drivers	The preferred option was acceptable to all stakeholders. The option was judged as an efficient approach, including the replacement of ABCB which had passed its asset lifecycle. Duration of outage can be reduced by mitigating the maintenance request in the ABCD during the installation works. Installation anticipated to be faster than Option 6 delivering the customer's connection sooner.
Selected Option	Option five - in-situ Disconnector system
Estimated Costs	XXXXXXXXXXXX XXXXXXXXXXXX
Outputs	The MSIP is driven by a single customer connection and has also been awarded a contract tot extent the number of connections.

168. As there is no measurable output in terms of contracted Transmission Entry Capacity on transformers to be delivered for this project, it is proposed that an evaluative Price Control Deliverable is defined.

169. The current contract requires the connections to be provided for SEPD at WISD6 66kV substation by 15th January 2023. Note, as referenced throughout this document that the customer is currently delayed on their part of the second connection which is currently being assessed separately for its implications on this date via the ModApp process.

7. Overview of assurance and point of contact.

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

171. This confirmation is provided by the Head of Future Price Controls, Electricity Transmission, 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.
- Quality assurance processes are in place to ensure NGET 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 NGET.

172. NGET's designated point of contact for this MSIP application is [redacted], Regulatory Development Manager, email [redacted] telephone [redacted]

8. Appendix

Appendix A Signed Agreement SEPD & ESO	APPENDIX A - Signed Final Contract_000060
Appendix B NGET/Ofgem Bilateral Notes	APPENDIX B _RE_ [EXTERNAL] RE_ MSIP
Appendix C Willesden SEPD Cost Model	APPENDIX%20C%20-%20MSIP%20Willesde
Appendix D Assurance Statement Letter	APPENDIX D - Assurance Statement
Appendix E Reopener Guidance Checklist	APPENDIX E - Reopener Guidance -
Appendix F Direct Cost/Asset Table	MSIPs%20Jan%2024%20Direct%20Costs%

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