national gas transmission

Decommissioning EJP – King's Lynn Cost Re-Opener

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0.1	Nov 2024	First draft
	Feb 2025	NGT Review
	Apr 2025	Ofgem Submission

Contents

1 Executive Summary

1.1.1 This Engineering Justification Paper (EJP) explains the engineering justification, detailed scope, delivery plan, efficient costs and requested regulatory allowances for the Decommissioning of King's Lynn Unit A. Our objective was to identify the most cost efficient and safe method to remove Unit A as part of the preferred MCPD options at King's Lynn.

1.1.2 Our proposed investment is a direct approach limited to safely demolishing Compressor Acoustic Buildings (CAB) A and all equipment within the structure and safely remove and dispose/recycle the equipment and make the CAB A area safe, whilst managing the cost of interventions for consumers.

1.1.3 SGT-A20 (Avon) Unit A was disconnected in 2017 after becoming life expired and beyond economical to continue investing in for current and future requirements.

1.1.4 Figures 1 and 2 below show the internal and external condition of compressor Unit A.

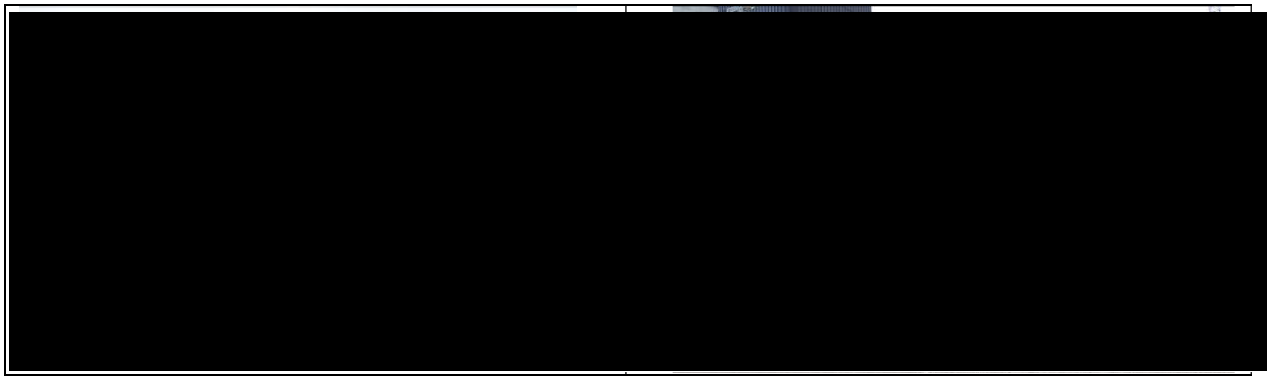

Figure 1: King's Lynn Compressor CAB A Exterior

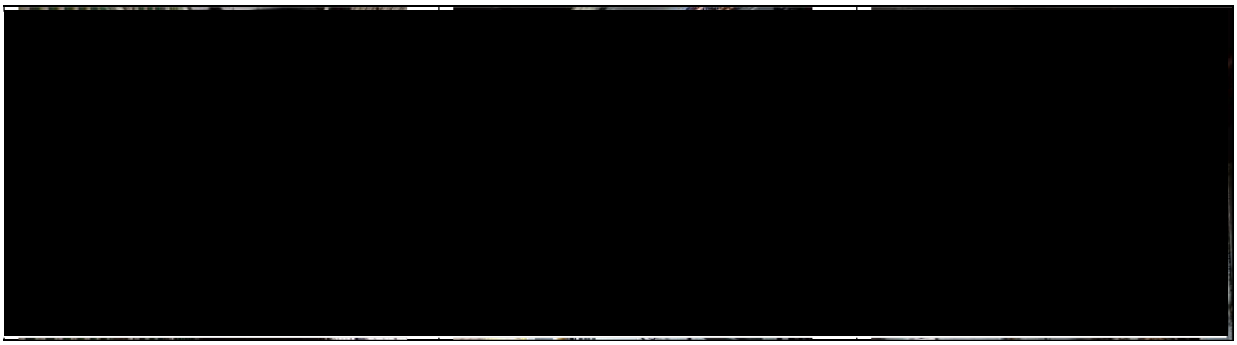

Figure 2: King's Lynn Compressor CAB A Interior

1.1.5 With Unit A now disconnected and out of use, Ofgem approved the justification to decommission Unit A as detailed in the Final Option Selection Report (FOSR).

1.1.6 [redacted]

1.1.7 The costs to deliver the Decommissioning of Unit A is based on Main Works Contractor (MWC) bottom-up estimates derived through preliminary engineering at this stage. Our contractor on the Demolition Framework has extensive experience and expertise in this field, hence costing is considered credible.

1.1.8 The project, now at ND500 project stage 4.4, recently completed a scoping survey to define scope and boundaries which further supports the cost of delivery and puts confidence in the range of +/-15%.

1.1.9 [redacted].

1.1.10 Customers and consumers benefit from responsible decommissioning activities. These can have a positive impact on nature and communities through reconstructing the environment and releasing materials back into the value chain to reduce the need to mine raw materials.

1.1.11 This EJP is intended to be reviewed in conjunction with the accompanying overarching document.

2 Introduction

2.1.1 A detailed Scoping Survey (Appendix D) was completed on Unit A in December 2024 to confirm the safest and most economic method to demolish and recover the area. Section 4 of the King's Lynn Scoping Survey details the proposed process to complete this project. Funding to complete this important project is now required in RIIO-T2 and RIIO-GT3.

2.1.2 Upon completion of the proposed investments the site will be rationalised, as the disconnected and redundant asset will be decommissioned and the CAB A area made available for other use.

2.1.3 Without this investment, the redundant compressor unit will continue to degrade and may incur costs to address unforeseen safety issues associated with degradation. It aligns with Ofgem's preferred option to decommission the disconnected Unit A as part of the King's Lynn MCPD works package.

2.1.4 Figure 3 below shows the King's Lynn site overview with Unit A shaded for reference.

Figure 3: King's Lynn Compressor Station

2.1.5 This EJP interacts with other documents to form the King's Lynn reopener submission pack as illustrated below in Figure 4 below.

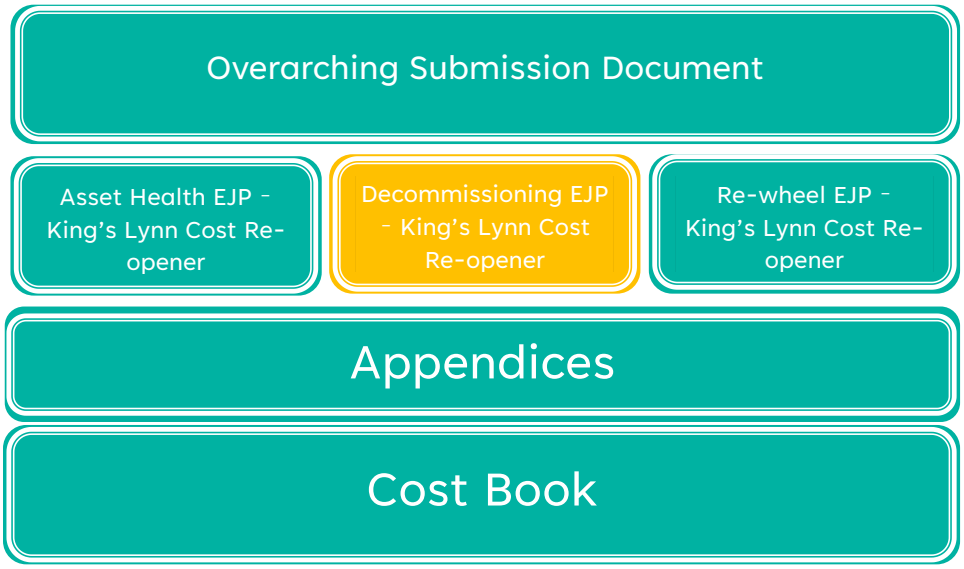

Figure 4: King's Lynn Reopener Submission Pack

Summary Table

2.1.6 Table 1 below sets out key information about the King's Lynn Decommissioning Investment project.

Name of Project	King's Lynn Decommissioning
Scheme Reference	PAC1051190
Primary Investment Driver	Compliance with MCPD legislation
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
Current Project Stage Gate	ND500 (4.4) Project Execution
Proposed UID	Ref - Table 5 of this EJP
Outputs PCDs	Ref - Table 5 of Overarching Document

Table 1: Summary Table for King's Lynn Compressor Unit A Decommissioning

2.1.7 Table 2 below sets out the cost summary for delivering the selected final option for this project. This is further detailed in the Cost Book Appendix A and Section 3 of the Overarching Document.

	RIIO-T2					RIIO-GT3				
(2018/19 price base)	**FY22**	**FY23**	**FY24**	**FY25**	**FY26**	**FY27**	**FY28**	**FY29**	**FY30**	**Total**
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Table 2: King's Lynn Decommissioning Cost Summary

3 Equipment Summary

3.1.1 There are a total of three operational units at King's Lynn that can run in multiple configurations to move gas East or West. Unit A and B are Siemens (formerly Rolls-Royce) SGT-A20 (Avon) compressor, and Unit C and D are Siemens SGT-400s. SGT-A20. Unit A was disconnected in 2017 after becoming uneconomical to continue investing in for current and future requirements.

3.1.2 The Avon SGT-A20, as shown in Figure 5, is a model of the Rolls-Royce (Now Siemens) Avon gas turbine engine, specifically designed for industrial applications. It's an aero-derivative gas turbine, meaning it was originally developed from an aircraft engine design but adapted for industrial use. The Avon SGT-A20 is commonly used in power generation and mechanical drive applications, such as driving compressors and pumps in the oil and gas industry.

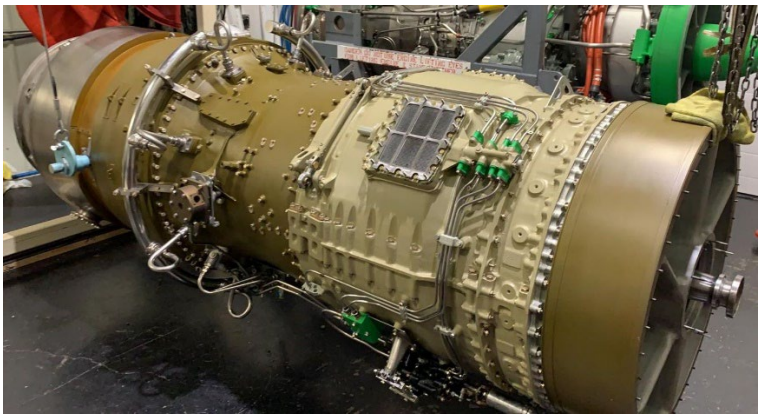

Figure 5: Siemens Avon SGT-A20

3.1.3 SGT-A20 Unit A, is now physically disconnected from the National Gas Transmission System by removal of two below ground Tee's previously connecting Unit A to a common inlet / outlet manifold as shown in Figure 6.

Figure 6: King's Lynn Cab A and B site diagram

4 Problem Statement

4.1.1 Commissioned in 1973, Unit A is a Siemens (formerly Rolls-Royce) SGT-A20 (Avon) compressor, and now over 50 years old.

4.1.2 Unit A was disconnected in 2017 and proposed to be replaced with a new unit as detailed in the FOSR Appendix G. Retrofit options involving the utilisation of Unit A have been considered and declined leading to its decommissioning.

4.1.3 The problem that the investment seeks to solve is to eliminate the current and future safety and environmental related risks of an asset which has no operational requirement and therefore degrading over time. Full decommissioning will remove these risks and avoid ongoing costs associated with the obligation to maintain the non-operational asset to minimum safety and environmental standards.

4.1.4 Furthermore, the project will ensure that the customers who have benefited from this asset incur the cost for the end-of-life intervention, this aligns with the polluter pays' principle set out in the Environment Act 2021.

How will we understand if the project has been successful?

4.1.5 Success will be measured by completing the full scope of decommissioning works as detailed in Section 5, Preferred Option, on schedule and within budget, and in compliance with relevant standards whilst minimising removed material to land fill.

4.1.6 The air will be tested and monitored for contaminants during works and the process will continue until all areas are cleared, returned to and accepted by site operations.

Spend Boundaries

4.1.7 This funding request only covers the decommissioning of Unit A at King's Lynn which form part of Ofgem approved works under the MCPD emissions FOSR for King's Lynn. The costs to complete Asset Health works on Unit B and the re-wheel of Units C and D are covered under separate EJPs.

4.1.8 The scope covered under this reopener submission has been assessed against the NGT RIIO-GT3 business plan to ensure there is no duplication of scope and volumes.

MCPD Emissions FOSR Approved Option

4.1.9 NGT's compressors need to comply with all emissions legislation within the Industrial Emissions Directive (IED). The Medium Combustion Plant Directive's (MCPD) deadline for our compressor compliance is January 2030.

4.1.10 Our Final Option Selection Report (FOSR) was submitted under Special Condition 3.11 King's Lynn Compressor Station Re-opener and Price Control Deliverable of NGT Gas Transporter Licence in January 2023. It set out our preferred option for compliance with the MCPD at the King's Lynn Compressor Station.

4.1.11 The Final Preferred Option approved by Ofgem in November 2023 to comply with MCPD by 2030 is Option 1, the counterfactual 'do nothing' option, with the existing non-compliant SGT-A20 (Avon) Unit A to be decommissioned as part of a combination of solutions to rationalise the site, optimise the operational resilience and availability of King's Lynn Compressor station.

4.1.12 The decommissioning of Unit A as described in this EJP will require investments in RIIO-T2 to initiate the project, and complete design and delivery in RIIO-GT3 as highlighted in Table 1.

5 Options Considered

5.1.1 Our decommissioning scope of works includes the decommissioning of Unit A and associated station pipework, including pressure reduction installation. King's Lynn Compressor Station is very space constrained which has presented a significant challenge to siting of welfare for project delivery work in the past.

5.1.2 Removal of Unit A to grade will alleviate this problem allowing the area to be used for temporary site welfare and other activities. Unit A decommissioning precedes Unit B Asset Health works, therefore this area is ideally situated and will be used for Unit B Asset Health works delivery.

5.1.3 The three main options are summarised in Table 4 below with advantages and disadvantages for each identified. Additionally, each option has sub options which consider how pipework and services area are treated within each main option.

Options Considered Summary

5.1.4 This section includes the variety of methods and process to safely demolish Unit A, and confirmation of scope boundaries.

Option 1 (Preferred Option) - Mechanical Demolition and Plinth Removal

5.1.5 This option includes mandatory asbestos removal followed by localised strip out of Unit A supported by mobile crane and demolition specific excavators. Once the unit enclosure, compressor drive train and exhaust stack have been removed, the concrete support plinth on which the compressor currently sits would be saw cut and broken out to a depth below ground of approximately 500mm.

5.1.6 The surrounding area local to Unit A would also be broken out to a depth of approximately 300mm to address current issues with uneven and broken ground. Both broken out areas would then be back filled with Material Takeoffs (MTO) (aggregate) to provide a safe and level area free of trip hazards. This is necessary as the area occupied by Unit A is adjacent to operational Unit B where safe vehicular and pedestrian access is required for the foreseeable future. Also, as mentioned previously, the area is intended for use as temporary welfare / storage to aid delivery of future project work including Unit B Asset Health.

5.1.7 Additionally, the Motor Control Centre (MCC) electrical cabinet providing electrical power to Unit A would also be removed together with associated electrical cables running from the MCC situated in the Control Building, out to Unit A.

5.1.8 Table 3 below sets out this option scope and considerations analysed to ensure the most economical scope required to achieve the required outcome. Further detailed in the Decommissioning Options Report Appendix S.

Main Option	Sub-Option Pipework	Preferred / non-preferred	Advantages	Disadvantages	Cost RAG
Preferred Option 1. Mechanical Demolition and Plinth Removal	1. Removal of all above and below ground pipework	Non-preferred	1.Area completely cleared for potential future re-use. 2. Reduced energy demand on the Cathodic Protection System (OPEX). 3. Prevents these costs being passed to future generations.	1. Deep excavations increasing safety hazards. 2. Significant costs associated with deep excavations and pipework removal. 3. Potential undermining of cable ducts and surface water drainage systems. 4. Longest delivery programme of the options.	
	2. Removal of all above ground pipework. Partial removal of below ground pipework.	Non-Preferred	1. Above ground area cleared for potential future re-use. 2. Reduced energy demand on the Cathodic Protection System (OPEX).	1. Some deep excavation increasing safety hazards. 2. Significant costs associated with deep excavations and pipework removal. 3. Second longest delivery programme of the Options.	
	3. Removal of all above ground pipework. Excavate 500mm below ground, cut pipework and	Preferred	1. Reduced depth of excavations compared with Options 1 and 2 which reduces hazards during demolition.	1. Grouted pipework below ground may require removal in the future for site development at considerable cost.	

	grout fill (deep pipework to remain).		2. Reduced energy demand on the Cathodic Protection System. 3. Least cost option.		
	Sub-Option Cables	**Preferred / non-preferred**	**Advantages**	**Disadvantages**	**Cost RAG**
	1. All Unit A electrical and instrumentation cables stripped out back to the Control Room	Preferred	1. Aligns with NGT Policy and Industry best practice for removal of redundant cables. 2. Frees up space in electrical ducts for future use. This has safety and process safety benefits for the Unit B Asset Health project. 3. Where assessed as reusable, this option would support this outcome.	1. Increased work in confined spaces during cable removal. 2. Increased short-term cost compared with Option 2 where cables are abandoned (future cost of removal).	
	2. Unit A electrical and instrumentation cables cut at Unit A and Control Room and fit abandonment kits (cables remain in ducts)	Non-Preferred	1. Lower short term cost option than full removal (option 1), however cables would require removal at some time in the future at additional cost. 2.Reduced work in confined space during demolition.	1. Increased CAPEX and OPEX cost associated with repeat cable testing of retained cables to prove dead (safety requirement). 2. No space for new cables for any future requirement. 3. Cable removal in the future would be at a higher cost than doing this while mobilised for this demolition project (inefficient working).	

Table 3: Decommissioning Preferred Option Scope Analysis

Option 2 (Non-preferred Option) - Manual Demolition and Plinth Removal

5.1.9 This option has the same scope as Option 1, but the demolition method is different in that it is done piecemeal by hand as opposed to by the Mechanical means (crane and excavators) in Option 1. This option is non-preferred as it is more labour-intensive, exposing an increased demolition work team (compared with Option 1) to the inherent safety risks associated with demolition activities. The MWC estimates for this option is 28% higher than the preferred option.

5.1.10 Option 1 is preferred over this option, as the use of machines to demolish the unit limits the number of Demolition Team Operatives in the area, with reduced exposure to the inherent safety risks associated with demolition activities. This options requirement for additional demolition operatives to be present naturally increases risk.

Option 3 (Non-preferred Option) - Mechanical Demolition, Plinth Retained

5.1.11 This option employs the same demolition method as Option 1, but the scope is reduced in that the concrete support plinth would remain. This option is non-preferred as leaving the concrete support slab in position renders valuable land largely unusable. The slab is of irregular shape, not lending itself for temporary storage or welfare which is at a high premium at King's Lynn Compressor Station.

5.1.12 The operations team at King's Lynn have plans to use the area flexibly to address current space constraints and issues with safety related to overcrowded areas during significant project delivery phases. Following demolition of Unit A, this area is ideally located adjacent the working areas for the Asset Health project on Unit B. The MWC estimates for this option is 19% less than the preferred option.

Options	Description	Preferred / non-preferred	Advantages	Disadvantages	Cost RAG
Option 1. Mechanical Demolition and Plinth Removal	Asbestos removal followed by localised strip out of Unit A supported by mobile crane and demolition specific excavators. Saw cut and break out concrete support plinth and surrounding area local to Unit A and make good ground with infill MTO to provide a safe and level area free of trip hazards.	Preferred	1. Limited work at height and manual handling. 2. No requirement for access scaffolding and screening. 3. Workers remote from the building during the piecemeal demolition. 4. Reduced programme and costs compared with Option 2. 5. The footprint of Unit A left level and even for future use (welfare and storage). 6. Shorter delivery programme than Option 2.	1. Higher cost option than Option 3	
Option 2. Manual Demolition and Plinth Removal	As Option 1. but piecemeal demolition of Unit A by hand as opposed to by Mechanical means (crane and excavators) in Option 1.	Non-Preferred	Works contained behind a screened area. Reduced people / plant interfaces compared with Option 1.	Labour intensive compared with Option 1. Cost of scaffold, screening and adaptations. Increased use of power tools and exposure to Hand-arm vibration. Additional hazards related to the use of a mobile crane compared with Option 1. Additional hazard related to more work at height and manual handling compared with Option 1. Increased exposure to noise, both personal and environmental compared with Option 1. Longer delivery programme than Option 1.	
Option 3. Mechanical Demolition, Plinth Retained	As Option 1, but the concrete support plinth would remain.	Non-Preferred	1. Limited work at height and manual handling. 2. No requirement for access scaffolding and screening. 3. Lowest cost option as concrete support slab is retained. 4. Reduced noise during demolition as slab is retained. 5. Shortest delivery programme of the Options considered.	1. Retaining the concrete slab presents trip hazards for personnel. 2. Retaining the concrete slab limits future use of the land for storage and welfare purposes. 3. Increased cost of future removal of the Concrete slab (inefficient in the long term).	

Table 4: King's Lynn Decommissioning Options

6 Preferred Option Scope, Challenges and Project Plan

6.1.1 As detailed in Section 5, Option 1 is the preferred scope which was derived from the Decommissioning Options Report (Appendix S) completed by our MWC and approved by NGT SMEs. The assessments outlined and the associated discounting demonstrates that the most viable, cost effective and logical option to take forward in this reopener is a mechanical demolition and plinth removal.

6.1.2 This is in line with the approved Ofgem option to decommission Unit A which was removed from service in 2017. This solution rationalises the site and contributes towards the safe and efficient operation of King's Lynn compressor station.

Project Scope

6.1.3 The project scope as established in Section 5 form the basis of the work and volumes detailed in this section. The work scope includes:

- Design and specification to confirm demolition methodology.
- Programming and coordination of works with coinciding site activities.
- Hire of machinery including cranes and scaffolding equipment.
- Temporary works including civils and groundworks.
- Removal of asbestos and all life expired sub-assets associated with Unit A .
- Site Acceptance.
- Collation and archiving of records.
- Update of operational drawings and asset registers.

Standards and Specifications

6.1.4 The following industry standards, specifications, and NGT guidance documents were reviewed to ensure that the decommissioning of compressor Unit A is conducted in alignment with recognised best practices, regulatory requirements, and established technical criteria by National Gas.

6.1.5 All relevant National Gas and Institution of Gas Engineers and Managers (IGEM) specifications, standards, and codes of practice applicable to this type of works were considered. This includes but is not limited to:

- National Gas Transmission Plc Technical & SHS and Standard Specifications
- Construction, Design and Management (CDM) Regulations 2015
- Health and Safety at Work etc Act 1974 (HSWA)
- Pressure Systems Safety Regulations (PSSR) 2000
- Pipeline Safety Regulations (PSR) 1996
- Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002
- Control Of Major Accident Hazards (COMAH) Regulations 2015
- National Federation of Demolition Contractors (NFDC) Guidance
- Environmental Protection Act 1990.
- T/PM/G/33 NGT Management Procedure for Redundant or Decommissioned Assets.

Decommissioning Works Summary

6.1.6 **Stripping out works** - The strip-out process includes, but is not limited to compressor and ancillaries, acoustic walls, doors and casings, redundant Mechanical and Electrical (M&E) fixtures within the compressor building. The Gas Generator has already been removed by NGT for fleet spares. The sequence of the strip-out process will aid in the segregation of the various waste streams for recycling purposes.

6.1.7 The majority of useful recoverable spare parts were removed and stored when the unit was disconnected in 2017. However, all remaining sub-assets as shown in Figure 7 removed intact will be conveyed to our

specialist maintenance partners to be assessed for re-use as spares. However, the age and condition of some of these sub-assets will preclude them from re-use as reconditioning may not be viable or cost-effective, as such, they will be stripped and recycled where possible.

6.1.8 The strip-out works will take place simultaneously in all areas. Once the demolition drops/exclusion/ and loading zones are in place, strip-out of all their fixtures and fittings will be conducted by the demolition operatives using traditional methods utilising handheld tools including, but not restricted to, pinch bars, hammers, mattock picks, shovels and wheelbarrows.

6.1.9 The LV Switchboards and Motor Control Centre (MCC) providing electrical power to Unit A will also be removed along with its associated electrical cables running from the Control Building out to Unit A as shown in Figure 11.

6.1.10 Reciprocating saws will be used to cut and process redundant pipe work, steel hangers, cable trays etc. Demolition breakers and lump or sledgehammers will be used to demolish walls by hand (if so, required given the mechanical demolition works that will follow).

6.1.11 All steel and concrete (slab) will be removed from site and taken away to licensed re-cycling centres to be recycled.

Figure 7: Example of sub-assets for manual strip-out

6.1.12 **Asbestos removal -** The removal of the licensed and non-licensed Asbestos Containing Materials (ACMs) will be in line with the contents of the Refurbishment and Demolition (R&D) - Demolition Asbestos Survey Report produced by Asbestos Solution Providers (ASP) on behalf of NGT. These works will be undertaken by an appointed Licensed Asbestos Removal Contractor (LARC).

6.1.13 Given the nature of the building within the scope of works, the works would be programmed in such a way that the strip-out and demolition of the Unit A compressor could follow on shortly after asbestos abatement.

6.1.14 Prior to any works commencing a Plan of Work will be produced and would be submitted to the HSE along with the ASB5 Notification (statutory notification to the HSE to notify of ACMs removal works). The Asbestos Removal Contractors Association (ARCA), Licensed Asbestos Removal Contractor (LARC) and Frank O'Gara & Sons Ltd (MWC) would be responsible for monitoring the works and liaising with the King's Lynn operational team regarding progress.

6.1.15 Our appointed licensed asbestos removal contractor will remove the ACM's identified within the respective asbestos demolition survey report in line with the Plan of Work. This document along with the ASB5 notification would be readily available on site for inspection by National Gas and other stakeholders.

6.1.16 These works will take place in accordance with Health and Safety Guidance HSG 247 - Asbestos: The licensed contractors guide' (HSE comprehensive guide for UK businesses to work with asbestos) as per the programme of works. Transit routes will be clearly identified, and warning signs will be placed at vantage points to warn other workers of the activity taking place. The Decontamination Unit (DCU - Hygiene Unit) will be placed as per the Traffic Management Plan (TMP) within immediate vicinity of Unit A.

6.1.17 [redacted]

6.1.18 [redacted]

6.1.19 The process will continue until all areas are clear. The hazardous waste will be removed from site in line with a hazardous waste consignment note by a licensed carrier. The notes will be presented to the NGT for our records and Health and Safety File.

6.1.20 **Demolition works** – The Unit A compressor is to be demolished / deconstructed in a controlled manner using heavy plant equipment as show in Figure 8 given its proximity to the operational Unit B.



[redacted]

Figure 8: Proposed Demolition Equipment

6.1.21 The steel frame will be deconstructed to mitigate the stress to the structure. This includes the steel frame to the exhaust stack.

6.1.22 Once the compressor building has been demolished, we will proceed with removal of all redundant civil features (supports, bases, plinths, steps, etc) as part of the demolition of the Unit A compressor.

6.1.23 The concrete support slab will be saw cut and broken out to a depth of 500mm below ground level along with gas pipework (currently protruding from the ground) which will be grout filled to prevent from future collapse/corrosion. The ground will then be made good to suit the surrounding area. This will enable the use as a secure area within the station for temporary project staging.

Decommissioning UID and Project Timeline.

6.1.24 We propose to use the following new UID aligned with our Re-opener request in Table 5 below.

New OFGEM UID	Funding Type	Intervention Type	Option Name	Unit of Measure	Business Theme	Delivery Theme	Uncertainty Mechanism
D.2.1.2.1	UM	Removal	Decommission King's Lynn Unit A	Per unit	Emissions	Emissions	Yes

Table 5: New Unit A Decommissioning UID

6.1.25 Table 6 and 7 below, gives the indicative milestones and project timeline for delivering the project across RIIO-T2 and RIIO-GT3.

	Activity Name	Indicative Completion Dates
[redacted]		

Table 6: King's Lynn Decommissioning Indicative Milestones

FY27				FY28				FY29			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
[redacted]											

[redacted]

Table 7: King's Lynn Decommissioning Project Timeline

Delivery Challenges

6.1.26 King's Lynn Compressor Station is a very busy and space constrained site. As mentioned previously, operational flow requirements during summer and winter vary greatly due to unpredictable market demands for gas import and export.

6.1.27 As Unit A is physically disconnected from the NTS, the decommissioning project is largely unaffected by these uncertain operational aspects. However, other planned projects such as the Asset Health refurbishment of Unit B, and Re-wheels of Units C and D require outages, which must be managed around operational requirements.

6.1.28 Due to the physical space constraints on the site, to accommodate MWC welfare, storage for plant and machines and to avoid conflict with these other projects, the decommissioning of Unit A has been scheduled ahead of these other projects to create a clear and secure area within the site compound for these temporary project amenities.

6.1.29 Unit A is in close proximity to operational Unit B. Safe demolition of Unit A without affecting Unit B operation will be challenging, as demolition type activities are inherently hazardous (falling objects and dust for example). To mitigate these risks, the MWC has included for strengthened physical barriers between Units A and B, also dust suppression measures.

6.1.30 Main line large bore below ground pipework is already disconnected and grouted. Small bore pipework grouting is included in the scope of this demolition.

Efficient Cost

6.1.31 [redacted]

[redacted]

6.1.33 [redacted]

[redacted]

[redacted]

Final costs from associated Cost Book

6.1.36 To ensure robustness of the EJP costs, NGT employed the use of a Designer / Main Works Contractor (MWC) to validate scope, understand some of the engineering challenges associated and to help refine details as well as building up an externally priced estimate showing how the market would cost works of this nature.

6.1.37 Table 8 provides a breakdown of the final costs for the project split by several categories.

	Cost Category	Costs (£m) 2024/25 Price Base	Costs (£m) 2018/2019 Price Base
[redacted]	[redacted]	[redacted]	[redacted]

	Cost Category	Costs (£m) 2024/25 Price Base	Costs (£m) 2018/2019 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]
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[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]		[redacted]
	[redacted]		[redacted]
	[redacted]		[redacted]

Table 8: Preferred Option Final Costs

6.1.38 The cost accuracy at this stage of the project is estimated at +/-15% in accordance with the Infrastructure and Projects Authority (IPA) cost estimating guidance. The investment and works will span across the RIIO-T2 and RIIO-GT3 periods.

Key Project Delivery Risks

6.1.39 The risk management process adopted by NGT is described in Appendix F, NGT Cost and Risk Methodology, chapter 3: Risk Methodology. Full descriptions of these risks and their potential impact, including qualitative and quantitative assessments and mitigations, are detailed within the project Risk Register in Appendix A King's Lynn MCPD Costbook.

6.1.40 [redacted]

6.1.41 The risks have been identified through a rigorous risk assessment process involving multiple iterations and broad stakeholder engagements. The risks have been prioritised based on their potential impact on the project which may cause cost and schedule overruns.

Risk ID	Scope	Title	Description	Probability Value (%)	P50 Value 2024/25 Price Base	P50 Value 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]

Table 9: Top Three Key Delivery Risks

7 Conclusion

7.1.1 This report has explained the approach NGT has taken to review and conclude the activities and process of decommissioning Unit A at King's Lynn compressor station. These works are essential to rationalise the site and optimise use of the land for safe plant storage and MWC welfare. Furthermore, it justifies our preferred option in a context of long-term cost efficiency and operational safety of personnel on site.

7.1.2 The project's agreed scope and cost have been assured for efficiency. The scope has been assessed against the current standards, while the costs have been assured by benchmarking against similar projects delivered on the network. The delivery programme aims to minimise the impact to network operations that may contribute to the failure to supply gas to our customers and stakeholders.

7.1.3 In addition, the report has explained the safety, environmental and operational risk concerns NGT has regarding the life expired asset and sub-assets described in this paper and the implications of these on the site. The decommissioning of Unit A is necessary to ensure safety, flexibility and operational efficiency of the site in the years to come.

7.1.4 [redacted]

8 Glossary

Glossary	
CBA	**Cost Benefit Analysis:** A mathematical decision support tool to quantify the relative benefits of each site option.
CDS	Conceptual Design Study
COMAH	Control of Major Accident Hazards (COMAH) Regulations 2015. Bacton Terminal is one of two designated NGT COMAH establishments. The other being St Fergus Terminal
EAC	**Estimated Cost At Completion:** A value expressed in money and/or hours to represent the projected final costs of work when completed.
ECI	Early Contractor Involvement
EJP	Engineering Justification Paper
EPC	Engineering Procurement and Construction
FES	**Future Energy Scenarios:** An annual industry-wide consultation process encompassing questionnaires, workshops, meetings and seminars to seek feedback on latest scenarios and shape future scenario work. The Future Energy Scenarios document is produced annually by National Grid ESO and contains their latest scenarios.
FOSR	Final Option Selection Report
GS(M)R	**Gas Safety (Management) Regulations:** The Gas Safety (Management) Regulations 1996 (GS(M)R) apply to the conveyance of natural gas (methane) through pipes to domestic and other consumers
HSE	**Health and Safety Executive**
IPA	**Infrastructure and Projects Authority**
LNG	Liquified Natural Gas, Natural gas that has been cooled to a liquid state (around -162°C) and either stored and/or transported in this liquid form.
MCC	Motor Control Centre
MWC	Main Works Contractor
(G)NDP	**Network Development Process:** The process by which NGT identifies and implements physical investment on the NTS.
NEA	Network Entry Agreement
NEC	New Engineering Contract
NGT	National Gas Transmission
NTS	**National Transmission System:** The high-pressure system consisting of Terminals, compressor stations, pipeline systems and offtakes. Designed to operate at pressures up to 94 barg. NTS pipelines transport gas from Terminals to NTS offtakes.
OEM	**Original Equipment Manufacturer**
Ofgem	**Office of Gas and Electricity Markets:** The regulatory agency responsible for regulating Great Britain's gas and electricity markets.

Glossary	
PSSR	Pressure Systems Safety Regulations 2000
RAM	**Reliability Availability Maintainability**
Re-opener	Re-openers are a type of RIIO uncertainty mechanism. Depending on their design, they allow Ofgem to adjust a licensee's allowances (in some cases up and in some cases down), outputs and delivery dates in response to changing circumstances during the price control period.
RIIO	**Revenue = Incentives + Innovation + Outputs**: RIIO-T2 is the second transmission price control review to reflect the framework; it sets out what the transmission network companies are expected to deliver and details of the regulatory framework that supports both effective and efficient delivery for energy consumers.
UM	Uncertainty mechanisms exist to allow price control arrangements to respond to change. They protect both end consumers and licensees from unforecastable risk or changes in circumstances.
UKCS	**United Kingdom Continental Shelf:** The UK Continental Shelf (UKCS) is the region of waters surrounding the United Kingdom, in which the country has mineral rights. The UK continental shelf includes parts of the North Sea, the North Atlantic, the Irish Sea and the English Channel; the area includes large resources of oil and gas.
UID	Unique Identifier