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Decision

Peterborough and Huntingdon Compressor Emissions – Final Preferred Option

Subject	Details
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We are publishing our decision on the Peterborough and Huntingdon Compressor Emissions – Final Preferred Option. This decision has been informed by the responses we received following publication of our consultation on 19 May 2023. Alongside this document we are publishing the non-confidential responses we received in response to our consultation

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Peterborough and Huntingdon Compressor Emissions – Final Preferred Option

In compliance with Special Condition 3.11 (Compressor Emissions Re-opener and Price Control Deliverable (CEP_t and $CEPRE_t$)) of National Gas Transmission's Gas Transporter Licence, National Gas Transmission (NGT) submitted a Final Option Selection Report in January 2023 which identified the Final Preferred Option for compliance with the Medium Combustion Plant Directive (the Directive) at the Peterborough and Huntingdon Compressor Stations. The Directive requires that existing gas turbines, between 1MW and 50MW net thermal input, must not exceed an emissions limit of 150mg/m³ Nitrogen Oxide (NOx) by 1 January 2030. By 2030, Peterborough and Huntingdon Compressor Stations will each have three gas turbine driven compressor units, comprised of two newly installed Solar Titans and a legacy Avon. A decision is required on the future of the legacy Avon unit as it is not compliant with the requirements of the Directive post 1 January 2030.

Special Condition 3.11 requires that a Final Option Selection Report is submitted in advance of any funding request. The Final Option Selection Report must contain a Final Preferred Option along with supporting evidence necessary for the Authority to make a determination. The Authority can

- Approve the proposed Final Preferred Option;
- Reject the proposed Final Preferred Option on the basis that the Authority considers no further work should go ahead at this time;
- Reject the proposed Final Preferred Option and approve one of the other options in the Final Option Selection Report; or
- Reject the proposed Final Preferred Option and set out additional information that should be provided to identify the best option before a resubmission of the Final Option Selection Report.

Our Decision

In accordance with Special Condition 3.11.9, we have decided to approve the Final Preferred Option identified by National Gas Transmission in the Final Option Selection Report.

In reaching our decision we have assessed the evidence presented in the Final Option Selection Report submitted by National Gas Transmission. Our assessment was set out in our Final Preferred Option consultation published on 19 May 2023. We have also taken account of the consultation responses received in reaching our decision.

In the case of Peterborough Compressor Station the Final Preferred Option includes the installation of new gas turbine driven compressor units of approximately 15MW output power (unit size to be determined during tender event) which will be commissioned by 2030. The new unit will be installed on an existing plinth. Subsequently the legacy Avon compressor unit will be decommissioned, subject to a reassessment following operational acceptance of the new unit.

In the case of Huntingdon Compressor Station the Final Preferred Option is the counterfactual 'do nothing', with the legacy Avon unit retained under the 500-hour Emergency Use Derogation allowed for in the Directive, with significant asset health investment to improve unit availability.

Separately, should National Gas Transmission identify a cost effective retrofit that will permit unrestricted operation of the existing Avon at Huntingdon Compressor Station, then we would expect National Gas Transmission to implement that solution and seek funding as part of the next price control.

1. Introduction

Context and related publications

1.1. In compliance with Special Condition 3.11, National Gas Transmission submitted a Final Option Selection Report in January 2023 which identified the Final Preferred Option for compliance with the Medium Combustion Plant Directive (the Directive) at the Peterborough and Huntingdon Compressor Stations. The Directive requires that existing gas turbines, between 1MW and 50MW net thermal input, must not exceed an emissions limit of 150mg/m³ Nitrogen Oxide (NOx) by 1 January 2030. By 2030 Peterborough and Huntingdon Compressor Stations will each have three gas turbine driven compressor units, comprised of two newly installed Solar Titans and a legacy Avon. A decision is required on the future of the legacy Avon as it is not compliant with the requirements of the Directive post 1 January 2030.

1.2. Special Condition 3.11 requires that a Final Option Selection Report is submitted in advance of any funding request. The Final Option Selection Report must contain a Final Preferred Option along with supporting evidence necessary for the Authority to make a determination. The Authority can;

- Approve the proposed Final Preferred Option;
- Reject the proposed Final Preferred Option on the basis that the Authority considers no further work should go ahead at this time;
- Reject the proposed Final Preferred Option and approve one of the other options in the Final Option Selection Report; or
- Reject the proposed Final Preferred Option and set out additional information that should be provided to identify the best option before a resubmission of the Final Option Selection Report.

Our decision making process

1.3. We published our proposed Final Preferred Option for consultation on 19 May 2023.[1] This document provides a summary of the responses received and our consideration of these responses. Following publication of this decision, National Gas Transmission may in accordance with Special Condition 3.11.11 submit a Re-opener application seeking a funding direction in June 2025.

General feedback

1.4. We believe that consultation is at the heart of good decision making. We are keen to receive your comments about this decision. We'd also like to get your answers to these questions:

1. Do you have any comments about the overall quality of this document?
2. Do you have any comments about its tone and content?
3. Was it easy to read and understand or could it have been better written?
4. Are its conclusions balanced?
5. Did it make reasoned recommendations?
6. Any further comments?

Please send any general feedback comments to stakeholders@ofgem.gov.uk

[1] https://www.ofgem.gov.uk/sites/default/files/2023-05/Consultation%20Peterborough%20and%20Huntington%20Compressor%20Emissions%20Final%20Preferred%20Option%20%28redacted%29.pdf

2. Background

Section summary

This section provides an overview of the RIIO-2 Re-opener mechanism and the Peterborough and Huntingdon Compressor Emissions Final Option Selection Report.

Overview of the RIIO-2 Re-Opener mechanism

2.1. The gas transmission network in Great Britain is owned and operated by National Gas Transmission. Economic regulation of the network follows the RIIO (Revenue = Incentives + Innovation + Outputs) price control framework. The current RIIO-T2 price control period will last five years from 1 April 2021 to 31 March 2026. Prior to commencement of the price control period, we set out in Final Determinations our policy on the economic regulation of the network during the period. These policy decisions were given effect by new Special Conditions in Part C of the National Gas Transmission Gas Transporter licence, which came into force on 1 April 2021.

2.2. In our RIIO-T2 Final Determinations, we accepted the 'needs case' for investment at several sites on the network, including Peterborough and Huntingdon Compressor Stations, to ensure compliance with the Medium Combustion Plant Directive. The Directive requires that by 1 January 2030 the Nitrogen Oxide (NOx) emissions of all gas turbines with a net thermal input of between 1MW and 50MW, do not exceed 150mg/m^3.

2.3. However, given the level of uncertainty at the time with respect to both the 'preferred option' and the level of funding required, we decided that this and other similar Compressor Emissions projects, should be funded through our Gas Transmission Project Assessment Process. This two stage process is set out in Special Condition 3.11 Compressor Emissions Re-opener and Price Control Deliverable.

2.4. At Final Determinations we provided £9.65m (2018/19 prices) of baseline funding in the form of a Price Control Deliverable for the Peterborough and Huntingdon Compressor Emissions project. The required deliverables were a Final Option Selection Report in January 2023 followed by a Re-opener application seeking a funding direction in June 2025. The Final Option Selection Report must contain a Final Preferred Option along with supporting evidence necessary for the Authority to either accept the Final Preferred Option,

or approve an alternative as the Final Preferred Option, reject the Final Preferred Option on the basis that no further work should go ahead or ask for more information. The Re-opener application must be based on the Final Preferred Option approved by the Authority.

2.5. In compliance with Special Condition 3.11, in January 2023, National Gas Transmission submitted a Final Option Selection Report for investment at the Peterborough and Huntingdon Compressor Stations to ensure compliance with the Medium Combustion Plant Directive. Following consideration of the Final Option Selection Report, we published our proposed Final Preferred Option for consultation on 19 May 2023. The consultation period closed on 14 July 2023, by which time we had received one response. In reaching our decision we have given due consideration to this response.

Final Option Selection Report

2.6. Peterborough and Huntingdon Compressor Stations are two important compressor stations on the National Transmission System. Both are located at strategic multi-junctions that convey gas in multiple directions to meet geographical and national demand. By 2030 Peterborough and Huntingdon Compressor Stations will each have three gas turbine driven compressor units, comprised of two newly installed Solar Titans and a legacy Avon. A decision is required on the future of the Avon units at the sites as they are not compliant with the requirements of the Directive post 1 January 2030.

2.7. Table 1 below summarises the shortlisted options considered in the Final Option Selection Report. The high-level options considered included:

- Doing nothing to reduce emissions from the non-compliant Avon unit (counterfactual) with the unit operated under the Emergency Use Derogation (EUD) i.e. limited to 500 run hours per year beyond 2030;
- Retrofitting of the non-compliant Avon unit with emissions abatement technology, Control System Restricted Performance (CSRP), Dry Low Emissions (DLE); and Selective Catalytic Reduction (SCR).
- Replacement of the non-compliant Avon unit with a new low-emission high efficiency gas turbine driven unit.

Option Shortlist	Legacy Avon	Solar Titan	Solar Titan	New Unit (Brownfield)
Peterborough				
1 – Counterfactual	500Hr EUD	No Change	No Change	/
2 - 1 x CSRP	CSRP Retrofit	No Change	No Change	/
3 - 1 x 1533 DLE	1533 DLE Retrofit	No Change	No Change	/
4 – 1 x SCR	SCR Retrofit	No Change	No Change	/
5 - 1 x New Unit	Decommission	No Change	No Change	New Unit (Brownfield)
Huntingdon				
A – Counterfactual	500Hr EUD	No Change	No Change	/
B - 1 x CSRP	CSRP Retrofit	No Change	No Change	/
C - 1 x DLE	DLE Retrofit 1533	No Change	No Change	/

Table 1 – Individual site Options summary

2.8. As the operation of Peterborough and Huntingdon Compressor Stations are very closely linked the options for both sites were considered together as a single, complementary project. Taking this combined approach highlighted that the highest value options for these sites included options for new machines at Peterborough Compressor Station but would only support retaining a legacy Avon at Huntingdon Compressor Station in some form. This finding was because of the relative location of the sites on the network and the predominant supply and demand patterns provided by Future Energy Scenarios. Table 2 below summarises the single set of options used in the Cost Benefit Analysis.

Option Shortlist	Peterborough		Huntingdon
	Legacy Avon	**New Unit (Brownfield)**	**Legacy Avon**
1 – Counterfactual	500Hr EUD	/	DLE Retrofit 1533
2 - 1 x CSRP	CSRP Retrofit	/	DLE Retrofit 1533
3 - 1 x 1533 DLE	1533 DLE Retrofit	/	DLE Retrofit 1533
4 – 1 x SCR	SCR Retrofit	/	DLE Retrofit 1533
5 - 1 x New Unit	Decommission.	New Unit (Brownfield)	DLE Retrofit 1533

Table 2 – Combined Cost Benefit Analysis Options summary

2.9. Table 3 below sets out the output from the Cost Benefit Analysis. The option with the highest Net Present Value (in this case the lowest negative) is the one that delivers compliance with the Directive at least cost over the assessment period. The lead option is Option 1 (Counterfactual) under all Future Energy Scenarios.

NPV £me (2018-19 prices)	Steady Progression	Consumer Transformation	Leading the Way	System Transformation
1 – Counterfactual	-£182 m	-£78 m	-£139 m	-£85 m
2 - 1 x CSRP	-£185 m	-£81 m	-£142 m	-£88 m
3 - 1 x 1533 DLE	-£187 m	-£84 m	-£151 m	-£90 m
4 – 1 x SCR	-£194 m	-£89 m	-£150 m	-£96 m
5 - 1 x New Unit	-£217 m	-£112 m	-£160 m	-£121 m

Table 3 - Cost Benefit Analysis Outputs

2.10. The Final Option Selection Report also included a Best Available Technique assessment. All shortlisted options were assessed as being Best Available Technology.

2.11. Several Security of Supply Case Studies were also considered as part of the Final Option Selection Report. National Gas Transmission argued that, given their critical location and function on National Transmission System, the Cost Benefit Analysis framework did not accurately reflect the value of having unrestricted compression services at Peterborough and Huntington Compressor Stations. Three separate benefits were identified as:

- Operational Strategy and Efficiency: Any unavailability at Peterborough or Huntingdon results in higher operating cost.
- Peak Day 1 in 20 Obligations: Modelling suggests that Peterborough and Huntingdon Compressor Stations, will continue to play a role in supporting demand capability in South-East England until 2050 and South-West England until at least the late 2030s.
- Gross Value Added: A 24 hour interruption in gas supplies to power generation was estimated to reduce electricity production by £14m (wholesale market prices) which could result in an economic loss of £1.5bn (Value of Load Loss).

2.12. National Gas Transmission also reviewed the three retrofit technologies, and determined that none currently provided a viable basis for compliance.

2.13. To determine the Final Preferred Option, the various assessments presented in the Final Option Selection Report were combined into a single assessment matrix as set out in Table 4 below.

Option Assessment Matrix Peterborough	Emissions Compliance	BAT Assessment	CBA	Security of Supply / Resilience	Technology Risk	Capital Investment
1 – Counterfactual	Achieves MCPD Compliance through **Derogation** **Note**: No NOx emissions abatement.	Lead Configuration: BAT Back-Up Score: 44% Versatility: 3/15%	Modelling based on FES does not capture key use cases of the site and risks resulting from loss of capability	**Ruled Out** Unrestricted backup necessary in event of parallel running		
2 - 1 x CSRP	Achieves MCPD Compliance through **Abatement** **Note**: No NOx emissions abatement.	Lead Configuration: BAT Back-Up Score: 50% Versatility: 9/15%		Provides Unrestricted Running	**Ruled Out** Avon exceeds original design life which risks critical site operation. Additional risk of CSRP permit rejection from EA	
3 - 1 x 1533 DLE	Achieves MCPD Compliance through **Abatement**	Lead Configuration: BAT Back-Up Score: 68% Versatility: 12/15%		Provides Unrestricted Running	**Ruled Out** Avon exceeds original design life which risks critical site operation. Additional risk that solution not yet commercially proven.	
4 – 1 x SCR	Achieves MCPD Compliance through **Abatement**	Lead Configuration: BAT Back-Up Score: 63% Versatility: 12/15%		Provides Unrestricted Running	**Ruled Out** Avon exceeds original design life which risks critical site operation. Requires new HSE procedures to handle ammonia on site and introduces new failure mode onto NTS.	
5 - 1 x New Unit	Achieves MCPD Compliance through **New Unit Build**	Lead Configuration: BAT Back-Up Score: 93% Versatility: 15/15%		Provides Unrestricted Running	New Compressor Technology proven on NTS	

Table 4 – Peterborough and Huntingdon Assessment Matrix

2.14. Based on these various analyses, National Gas Transmission's Final Option Selection Report identified Option 5 (1 x New Unit at Peterborough Compressor Station and retrofitting one of the legacy Avon units at Huntingdon Compressor Station with Dry Low Emissions technology) as the Final Preferred Option.

Our proposed Final Preferred Option

2.15. On 19 May 2023 we published a consultation setting out our assessment of the evidence presented in the Final Option Selection Report. We proposed rejecting the option identified by National Gas Transmission as the Final Preferred Option (Option 5) and approve one of the other shortlisted options as the Final Preferred Option.

2.16. For both Peterborough and Huntingdon Compressor Stations our proposed Final Preferred Option in both cases is the counterfactual 'do nothing' with the legacy Avon retained under the 500-hour Emergency Use Derogation allowed for in the Directive, with significant asset health investment to improve unit availability.

2.17. Separately, should National Gas Transmission identify a cost-effective retrofit, that will permit unrestricted operation of the legacy Avon units at Peterborough and Huntingdon Compressor Stations, then we would expect National Gas Transmission to implement that solution and seek funding as part of the next price control.

2.18. The consultation period closed on 14 July 2023, with one response being received. Responses not marked as confidential have been published alongside this decision.

3. Summary of responses and our view

Section summary

This section contains a summary of the responses we received and our views on the various issues raised.

Responses to specific questions

Question 4.1: Do respondents agree with our assessment of the evidence presented in the Final Option Selection Report?

3.1. The single respondent (NGT) broadly agreed with our assessment but challenged it on several points, set out below.

Role of Peterborough & Huntingdon Compressor Stations

3.2. Peterborough and Huntingdon Compressor Stations deliver significant value to the Southeast and Southwest of the network through (1) zonal linepack management and (2) provision of pressure cover. This value is not captured within the Cost Benefit Analysis because these activities occur within day and all the risk modelling is based on end of day values.

3.3. The position in the network of other upstream and downstream compression means it is unable to react to unforeseen events as effectively as Peterborough and Huntingdon Compressor Stations. Examples include: a trip at Isle of Grain Liquified Natural Gas import terminal, a power station staying online longer than forecast, the daily forecast being inaccurate or a sudden turn up of power station demand. Resilience at these sites allows the network to react quickly to such events mitigating potential risks to within day constraints.

3.4. Post 2030, without intervention National Gas Transmission will have a significant proportion of the compressor fleet in the Southeast (60%) on 500-hours Emergency Use Derogation.

Security of Supply Case Studies

3.5. There are credible scenarios in which the third standby unit operating under the 500 hour per annum Emergency Use Derogation would put at risk the licence obligation to supply a level of firm peak aggregate daily demand is likely to be exceeded (whether on one or more days) only in 1 year out of 20 years.

3.6. During the period January 2015 to May 2023, there have been 164 outages that have lasted longer than 500 hours (three weeks) across the National Transmission System compressor fleet. Further detail on an illustrative sample of these unplanned outages was included.

3.7. Compressor run hour forecasts presented in the Final Option Selection Report are derived from seasonal normal temperatures. Run hours would be higher in years where temperatures are lower than normal. Increasing the risk that the 500 hour limit on the standby unit would be exceeded. For example, cold weather in 2017/18 required 7,118 run hours at Peterborough Compressor Station with 91% (6,688 hours) through parallel running. The models used in developing the Final Option Selection Report forecast that in 2017/18 the standby unit would be required for 623 hours. In reality, the unit with the lowest run hours operated for 1,558 hours. In the previous 20 years there have been five winters colder than 2017/18.

3.8. In addition to cold winters, run hours above those predicted in the Final Option Selection Report may occur due to for example (1) lower supplies from Isle of Grain Liquified Natural Gas import terminal, (2) managing increased offtake flexibility required by network users such as gas fired power generation through the management of linepack and (3) continued high levels of gas demand under the Steady Progression Future Energy Scenario.

3.9. The assumption that there are operational or commercial alternatives to parallel unit operation at Peterborough Compressor Station as the means of meeting 1 in 20 peak aggregate firm demand is incorrect.

3.10. In the scenario where parallel unit operation is not available, under peak conditions then gas flow through Peterborough Compressor Station drops by around 20 mscm/d from 125 to 105mscm/d. This decline in capability cannot be compensated for across the

network given the limitations on moving gas into the southern part of the network. Under relevant 1 in 20 peak day scenarios, the estimated shortfall in the South West could be up to 13mscm/d. Forecast 1 in 20 aggregate firm peak day demand in the Soth West in 2030 is 75mscm/d in the Steady Progression Future Energy Scenarios. Differences in forecast peak day demand between the various Future Energy Scenarios are much smaller than for annual demand. The scenario assumes supplies from Bacton Gas Terminal and Isle of Grain would be sufficient for the South East demand to be met. Should this not be the case then the capability gap in the South West would be compounded and/or create a shortfall in South East.

3.11. Commercial contracts would be very expensive and provide limited assurance to reduce demand or increase supplies. Demand reductions are difficult to enforce due to interactions with electricity capacity markets and the very high penalties on generators. Supply turn-up contracts are also very expensive and provide no guarantees the supply will be available when called upon.

Availability

3.12. Availability data from the Reliability Availability Maintainability (RAM) study was not directly applicable to units operating under the Emergency Use Derogation reducing network resilience over time. Standby units need to be operated periodically to maintain their availability. Where total run hours are limited this reduces the number of run hours available for standby operation is required. It also causes operational difficulties due to the need to carefully plan and husband the use of limited run hours.

3.13. There remains a risk that during the Front End Engineering Design phase major asset health issues will be identified on units planned to be retained under the Emergency Use Derogation increasing project scope and cost or undermine the viability of the option entirely. In addition, long term operation of an existing Avon increases risk due to age related fatigue, loss of engineering experience, dwindling support, lack of field service capability, minimal OEM support, low spares availability (often refurb only) and an inability to purchase OEM long term support packages.

Our View

Role of Peterborough & Huntingdon Compressor Stations

3.14. In reaching our decision we have given due regard to the role and value of Peterborough and Huntingdon Compressor Stations to the operation of the National Transmission System. We consider that our Cost Benefit Analysis provides a flexible framework for option appraisal allowing for the valuation of a wide variety of costs and benefits. In any event as we make clear in section 'Other issues raised by respondents' below we did not limit our assessment to outputs from the Cost Benefit Analysis.

3.15. With respect to the role of Peterborough and Huntingdon Compressor Stations in addressing unforeseen events – this would seem to be an issue of differences in site availability between options. The Site Availability Model included in the Final Option Selection Report indicates that installing a new gas turbine will only deliver a small improvement in overall site availability when compared to retention of a legacy Avon compressor unit. We remain to be convinced that the extra investment is justified by the improvement in overall site availability.

Security of Supply Case Studies

3.16. We note the data provided on unplanned outages since 2015. This and other relevant information will be reflected in the Cost Benefit Analysis through the Reliability Availability Maintainability (RAM) study and Site Availability analysis. We note that the context around the outages was not provided and so it isn't clear how useful this evidence is without further scrutiny.

3.17. We do not believe it is appropriate for this assessment to assume that an outage of 21 days duration will exhaust available run hours under the Emergency Use Derogation. It is based on continuous operation for 21 days which is highly unlikely. It also ignores the provision in the Derogation which permits up to 750 run hours in any single year. A much longer outage is therefore likely to be required before available run hours are exhausted. How long this is will be situation specific but it should be possible to develop more appropriate assumptions based on the models and data available to National Gas Transmission.

3.18. In our Consultation we accepted that there were plausible situations the legacy Avon at Peterborough Compressor Station would be required to operate for longer than permitted

under the Emergency Use Derogation. The respondent has provided more evidence in support of this assessment principally with respect to the impact of cold weather on predicted run hours.

3.19. The respondent has clearly demonstrated that parallel unit operation at Peterborough Compressor Station is the only viable mode of network operation that will deliver compliance with Standard Condition 16 Pipe-Line System Security Standards in the South West and potentially South East. The ability to supply a level of firm peak aggregate daily demand is likely to be exceeded (whether on one or more days) only in 1 year out of 20 years.

3.20. Capping the available running hours of the standby (third) compressor unit, as is the case under the Emergency Use Derogation, would negatively impact the ability of National Gas Transmission to comply with Standard Condition 16 (Pipe-Line System Security Standards) of the Gas Transporter licence.

Availability

3.21. We would have expected that any reduction in availability over time would have been accounted for in the Reliability Availability Maintainability (RAM). We recognise that any standby unit will need to be operated in a way that ensures that it is available when required and that this will use up a proportion of restricted run hours. We recognise that there are plausible scenarios in which the standby unit at Peterborough Compressor Station will exceed the Emergency Use Derogation limit on run hours. This risk is increased by the need to operate the standby unit to maintain availability.

3.22. We recognise that unforeseen asset health issues may be identified at the Front End Engineering Design phase. However, we have no reason to assume that these would be any greater than those associated with installing a new compressor unit. Nor would they be of sufficient magnitude to alter the outcome of the Cost Benefit Analysis. Regarding issues relating to long-term operation of an Avon, we believe that the Avon market is sufficient large that suitable support will continue to be available into the future. Should the risks identified crystallise at some point in the future, then there will be sufficient time to take mitigating action.

Question 5.1: Do respondents agree with our proposed Final Preferred Option?

3.23. The single respondent (NGT) did not agree with our proposed Final Preferred Option at Peterborough Compressor Station. Any option that included running hours on the standby compressor unit would put at risk the ability of National Gas Transmission to meet its licence obligation to supply a level of firm peak aggregate daily demand which is likely to be exceeded (whether on one or more days) only in 1 year out of 20 years. It would also restrict the options available for compliance with the Medium Combustion Plant Directive at many other compressor units in the southern part of the National Transmission System.

Our View

3.24. Having considered the evidence presented in response to the Consultation, we have concluded that capping the available running hours of the standby (third) compressor unit, as is the case under the Emergency Use Derogation, would negatively impact the ability of National Gas Transmission to comply with Standard Condition 16 (Pipe-Line System Security Standards) of their Gas Transporter licence. Although there may be several technologies that would permit unrestricted operation of the legacy Avon compression unit post 1 January 2030 (including Dry Low Emissions technology), there is no certainty that any of these will receive the necessary regulatory approvals or become commercially available. For this reason, we consider that the only way to guarantee unrestricted operation is the installation of a new gas turbine driven compressor unit at Peterborough Compressor Station. We have therefore rejected our proposed Final Preferred Option raised in the Consultation in favour of the option identified by National Gas Transmission in their Final Option Selection Report (Option 5), as it applies to Peterborough Compressor Station.

Question 5.2: Do respondents agree with our proposals approach to potentially removing restrictions on the operation of the retained Avon (Unit B)?

3.25. The single respondent (NGT) agreed with our assessment that Dry Low Emissions technology maybe an effective way to reduce emissions and deliver compliance. It has therefore been included in the option selection process and included in the option selected at Huntingdon Compressor Station. However, they maintained that retaining a legacy Avon unit at Peterborough Compressor Station is not the right solution. There is no guarantee that the technology will be approved by regulators or become commercially available. Although it would remove the restriction on running hours, its lower availability when compared to a new compressor unit means that it is not suitable for a site as critical as Peterborough Compressor Station.

Our view

3.26. Our Final Preferred Option no longer includes the retention of a legacy Avon at Peterborough Compressor Station. It does however include the retention of a legacy Avon unit operating under the Emergency Use Derogation at Huntingdon Compressor Station. We recognise that the Emergency Use Derogation will reduce operational flexibility and in exceptional circumstances could result in additional network constraints. We believe that there are potentially viable cost-effective technologies which may become available in the next 5 years that would permit unrestricted operation. These should be pursued by National Gas Transmission for implementation during the next price control.

Other issues raised by respondents

3.27. The single respondent (NGT) raised several broader issues as set out below.

3.28. The respondent contended that there is an over reliance on Future Energy Scenarios when determining the Final Preferred Option. These scenarios are designed to reflect credible pathways towards net zero. This provides a challenge when putting the proper value on assets linked to security of supply, rather than net zero related growth sectors, within the Cost Benefit Analysis framework.

3.29. This underlying uncertainty that exists with respect to the decarbonisation of major sectors of the economy in particular domestic heating and questioned assumptions about how quickly this could have been achieved given the slow take of heat pumps.

3.30. There is also a need to make investment designs that maintain the existing resilience of the National Transmission System. This is clearly demonstrated by the disruption in global gas markets following the Russian invasion of Ukraine which saw a fold increase in gas exports from Great Britain during 2022-23. Such uncertainties are not captured in Future Energy Scenarios. It was noted that the invasion of Ukraine has led to a Government focus on ‘commodity security’ and that the British Energy Security Strategy

(April 2022)[2] includes a regular gas security assessment expected to be based on a peak demand scenario. Ongoing discussions between Ofgem, National Gas Transmission, Department of Energy Security and Net Zero and the System Operator on the topic of network resilience were also highlighted as potentially impacting the economic assessment of infrastructure investments.

3.31. Standard Condition 16 (Pipe-Line System Security Standards) of National Gas Transmission's Gas Transporter licence sets the primary design standard for the National Transmission System. The ability to supply a level of firm peak aggregate daily demand is likely to be exceeded (whether on one or more days) only in 1 year out of 20 years, taking account of weather data derived from at least the previous 50 years and other relevant factors. The respondent was of the view that the standard should be extended to include network resilience, that is how often the network is capable of meeting the 1 in 20 standard with all necessary assets available.

3.32. Special Condition 9.11 (Transmission Planning Code) that requires National Gas Transmission to have in place such a Transmission Planning Code (approved by the Authority) and implement and comply with it. The latest version was approved in 2021. Section 6.17.6 of this code which relates to standby compression states that:

Compressor failure (non-availability) is more likely to occur than a 1-in-20 demand day. Hence within or prior to a 1-in-20 demand day a compressor may have failed. Therefore, we need compressor standby to comply with our obligation to develop the network to meet the 1-in-20 security standard. Standby is identified to ensure that the required transmission capability is maintained in the event of a credible loss of any single compressor unit.

[2] https://assets.publishing.service.gov.uk/media/626112c0e90e07168e3fdba3/british-energy-security-strategy-web-accessible.pdf

Our view

3.33. We believe that Future Energy Scenarios provides a robust basis for Cost Benefit Analysis. A robust Cost Benefit Analysis will also include and appropriate Sensitivity Analysis. In our Consultation we were clear that:

Although Cost Benefit Analysis and Best Available Technology assessments are key decision making tools, they are not the only considerations that should be given weight, nor should they be used in isolation.

3.34. The Final Option Selection Report included an assessment matrix (Table 4). In our Consultation we were clear that:

We believe it provides a clear articulation of the various considerations that contribute to the overall decision- making process

3.35. Our Final Preferred Option decision has been reached following due consideration of all the relevant factors including Security of Supply and we do not accept that any over reliance on Future Energy Scenarios.

3.36. We note the concerns expressed with respect to the underlying uncertainty that exists with respect to the decarbonisation of major sectors of the economy We encourage National Gas Transmission to use the established annual Call for Evidence mechanism to present their arguments to assist National Grid Electricity System Operator in preparing Future Energy Scenarios.

3.37. We recognise that the issue of network resilience has gained increased attention since the invasion of Ukraine and we are actively participating in the ongoing discussions with other relevant parties. Until firm conclusions have be reached it is not possible to assess the impact if any on the methodologies used in the assessment of network investments.

3.38. We do not accept that the Transportation Planning Code requires that standby compression is available at every individual Compressor Station. The point of an integrated network is that individual assets are mutually supporting which reduces the absolute scale of the network required to deliver a specified level of capacity and resilience. In any case our proposed Final Preferred Option does not reduce the number of Compressor Units at

either Peterborough or Huntingdon Compressor Station with the retained Avon unit being used primarily for standby in support of the two lead Solar Titan units.

3.39. However based on the evidence presented by the respondent we accept that restricting the available running hours of the standby (third) compressor unit, as is the case under the Emergency Use Derogation, materially reduce the ability of National Gas Transmission to comply with Standard Condition 16 (Pipe-Line System Security Standards).

4. Conclusion

Our decision

4.1. In reaching our decision, we have assessed the Final Option Selection Report submitted by National Gas Transmission. Our assessment was set out in our Final Preferred Option consultation, published on 2 June 2023. We have also taken account of the consultation responses received in reaching our decision.

4.2. In accordance with Special Condition 3.11.9, we have decided to approve the option identified by National Gas Transmission in the Final Option Selection Report (Option 5) as the Final Preferred Option in relation to Peterborough Compressor Station.

4.3. This option includes the installation of a new gas turbine driven compressor unit of approximately 15MW output power (unit size to be determined during tender event) which will be commissioned by 2030. The new unit will be installed on an existing plinth. Subsequently the legacy Avon compressor unit at Peterborough Compressor Station will be decommissioned, subject to a reassessment following operational acceptance of the new unit.

4.4. In the case of Huntingdon Compressor Station, the Final Preferred Option is the counterfactual 'do nothing' option. Under this option, the existing Avon compressor unit will be retained under the 500-hour Emergency Use Derogation allowed for in the Directive, with significant asset health investment to improve unit availability.

4.5. Separately, should National Gas Transmission identify a cost effective retrofit, that will permit unrestricted operation of the existing Avon at Huntingdon Compressor Station, then we would expect National Gas Transmission to implement that solution and seek funding as part of the next price control.