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Dear Colleagues,

Our decision on National Grid Gas Transmission's compressor investment needs case at St Fergus and Hatton

This letter sets out our¹ final decision on National Grid Gas Transmission's (NGGT) needs case submission for replacement of compressors at St Fergus and Hatton to make them compliant with emissions control legislation.

NGGT's proposed works included building new compressor units at both sites with forecast costs of £80.4m² at St Fergus and £90.8m at Hatton. In August 2019, we published our initial views³ (the August 2019 consultation) on NGGT's submission. We received five responses to our consultation in total, non-confidential responses are available on our website⁴.

Summary of our final decision

Our decision on NGGT's proposed works at St Fergus and Hatton sites is set out below:

- We maintain our view that there is the need to decommission two IED non-compliant RB211 compressor units at St Fergus. We maintain our view that there is no need to construct any new compressor units at St Fergus at this time (i.e. RIIO-T1, which runs to 31 March 2021).

¹ The terms the 'Authority', 'Ofgem', 'we' and 'us' are used interchangeably in this letter. The Authority is the Gas and Electricity Markets Authority. Ofgem is the office of the Authority.

² All costs in this document are reported in the 2018/2019 price base, unless otherwise stated.

³ [St Fergus and Hatton Needs Case Consultation](#)

⁴ [St Fergus and Hatton Consultation Responses](#)

- We maintain our view that there is the need to decommission two IED non-compliant RB211 compressor units at Hatton. We maintain our view that there is a need to invest at Hatton to maintain resilience at the site. Our decision is to approve the need for a single new compressor unit at the site. Funding will be assessed as part of the RIIO-2 price control settlement. Cost assessment will take into account whether and to what extent NGGT has sought to develop a cost effective build strategy with consideration given to greenfield vs brownfield build.

Background

NGGT operates a number of gas-fired compressor units across the gas transmission network. These compressors maintain the required pressure of gas on the network and help ensure that gas is transported across the network to where it is needed. The operation of gas fired compressor units results in the emission of air pollutants, such as carbon monoxide and nitrous oxides. NGGT is obliged under law to control and manage the release of these air pollutants.

There are three main Directives that influence NGGT's compressor operations in this regard, namely⁵:

- The Industrial Emissions Directive;
- Medium Combustion Plant Directive (MCP); and
- Ambient Air Quality Directive.

In its RIIO-T1 business plan submission, NGGT forecast an expenditure of £1,068.1m (£813.5m in 09/10 prices) for proposed work to ensure compliance with emissions control legislation. We considered that NGGT had not fully justified its proposed plans and costs for compressor replacement. Specifically, in Ofgem's view NGGT had not explored the available options in terms of technical solutions and derogations. Following our assessment, we provided baseline funding of £187.4m⁶ (£142.7m in 09/10 prices) for IED compliance at three sites: Peterborough, Huntingdon and Aylesbury. We also set a provisional allowance of £378.2m (£288m in 09/10 prices) for works at other sites, subject to an uncertainty mechanism during the RIIO-T1 control.

In May 2015, NGGT submitted a reopener application, with the allowance increased from the provisional amount by £53.8m (£41.0m in 09/10 prices), for its proposed works to

⁵ More information on these legislative requirements can be found in our consultation document.

⁶ pg 98 [RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas Cost assessment and uncertainty Supporting Document](#)

comply with emissions legislation. We rejected⁷ NGGT's application for this funding. In our view, NGGT had not considered all options available to it in sufficient detail when developing its solutions for IED compliance. We stated that NGGT should "include the costs and benefits of all considered options as part of its submission".

In May 2018, NGGT submitted a reopener application for a reduced expenditure of £163.0m (£123.4m in 09/10 prices), which included a variety of interventions across nine sites, including (among others):

- St Fergus: £33.0m (£24.7m in 09/10 prices) for preliminary engineering, design and procurement work relating to emissions reduction and compliance work on two compressor units.
- Hatton: £25.0m (18.9m in 09/10 prices) for preliminary engineering, design and procurement work relating emissions reduction and compliance work on one compressor unit.

We rejected⁸ NGGT's application in 2018 with the exception of a £0.53m funding to meet IED compliance at one site. For proposed works at six other sites, we decided that either there was already funding provided or the reopener was not applicable. For the remaining two sites (St Fergus and Hatton) we maintained our view that there remained uncertainty about the best solution and the costs associated with that solution. We agreed to work together with NGGT to review the needs case and preferred solution for emissions compliance at St Fergus and Hatton. We stated that, if we were satisfied with the needs case submission, we would provide formal written agreement of the needs case, and assess funding as part of the RIIO-2 price control settlement.

In June 2019, NGGT submitted an updated needs case for investment at its St Fergus and Hatton sites. Our assessment of this submission was based on the assessment approach we set out in our reopener 2018 decision, with consideration given to our RIIO-2 objective of ensuring that networks are prepared for the future and reflect the needs of the existing and future consumers. Our assessment was limited to the needs case and proposed solutions and does not give a view on the efficient costs to complete the proposed works.

⁷ pg 1 [RIIO-T1: Our decision on National Grid Gas Transmission's application under the RIIO-T1 Compressor Emissions uncertainty mechanism \(2015\)](#)

⁸ [Industrial Emissions Costs Decision](#)

Our initial views

St Fergus

In our August 2019 consultation, we stated that we agree with the need to decommission the RB211s at St Fergus. However, we did not consider there to be a technical need to invest as the existing compressor fleet is able to meet current forecasts of flows at the site.⁹ We were not convinced that the proposed £80.4m investment would be required to achieve compliance with IED.

Given the lack of evidence in NGGT's needs case submission regarding asset condition, we stated that we do not accept NGGT's view of asset health spend that has been included for the no investment option and we are not convinced by the Cost-Benefit Analysis (CBA) presented.

In addition, we stated that the ability of the St Fergus site to meet required gas flows may need to be reviewed for the 2030 Medium Combustion Plant (MCP) deadline¹⁰. We will assess any future needs case and proposed solution based on the merits of the submission at the time.

Hatton

We stated that we agree with the need for investing in new compression capacity at Hatton. This initial view was based on our assessment that it is appropriate to have resilience at Hatton to avoid investment at multiple other sites and to ensure that 1-in-20 peak day demand¹¹ can be met without having to rely on turn down or supply contracts with third parties.

Following our review of the options selection process undertaken by NGGT and relative costs of the options, we were not convinced of the solution put forward by NGGT. This initial view was based on our assessment that NGGT had not considered an appropriate set of options, in particular:

- Fitting a new and compliant gas fired drive to the existing compressor unit (i.e. retrofitting); and

⁹ Flow forecasts were provided by NGGT and used industry recognised Future Energy Scenario forecasts.

¹⁰ Directive (EU) 2015/2193 on the limitation of emissions of certain pollutants into the air from MCPs known as the Medium Combustion Plant Directive (MCPD) regulates pollutant emissions from the combustion of fuels in plants with a rated thermal input equal to or greater than 1 Megawatt thermal (MWth) and less than 50 MWth. Affected plants in NGGT's compressor fleet will have to cease operation or run for a maximum of 500 hours per annum on a 5-year rolling average from 01 January 2030.

¹¹ The 1-in-20 peak day demand output provides a minimum security of supply standard to protect GB gas consumers. NGGT is obliged by its licence to ensure that the transmission system is capable of meeting a level of gas demand which is only likely to be exceeded (whether on one or more days) 1 year within 20 years.

- Installation of a single compressor unit with a refined design which would minimise the identified contracting costs.

We welcomed further evidence on the parallel operation of a single compressor unit with the VSD at Hatton and the appropriateness of the duty points on which the current solutions are based. We stated that, where appropriate, the findings of this work should be reflected in an updated CBA.

In addition, we asked NGGT to clearly demonstrate the relevant health and safety legislative conditions that prevent it from making use of the existing compressor bays instead of a greenfield site.

Stakeholder views

We received five responses to our consultation from NGGT, including Centrica, the Scottish Environment Protection Agency (SEPA), Equinor, and one other confidential response.

General comments

The responses did not provide a clear consensus of views about NGGT's submission and our assessment of it.

NGGT set out its view of the need for proposed investment at both sites to comply with environmental legislation. NGGT's view was supported by the response received from Equinor. However, other respondents, namely Centrica and SEPA, shared different views.

Centrica stated that NGGT's proposals should interact with the RIIO-2 Compressor Emissions Compliance Strategy. Centrica also raised the point that the proposals would be better justified if they were informed by the results of NGGT's Network Capability review.

Two respondents questioned our approach to the needs case assessment. NGGT noted that our assessment could have formed part of the May 2018 reopener. NGGT also requested additional tripartite engagement between Ofgem and the environmental regulators. Equinor agreed that there was merit in assessing the technical elements of NGGT's proposal. However, they raised concerns that Ofgem and NGGT have not reached a consensus after extensive engagement.

St Fergus specific responses

SEPA outlined their stance in relation to the environmental need for investment at St Fergus. Their response noted that NGGT should assess the environmental impact of the combustion emissions and operate with the Best Available Techniques (BAT) should the existing fleet of unabated Avons continue to operate until 2030. SEPA commented that NGGT should consider the environmental and financial cost of installing two new compressors compared to running existing Avons from 2023-2030.

SEPA reached a view that the cost of installing new compressor units at St Fergus prior to 2030 would not be proportionate given the potential emissions savings. They also highlighted that investment may be needed in the long term due to the requirements of the MCP directive.

There was no consensus among respondents on the technical need for investment at St Fergus. NGGT disagreed with our stance that new investment at St Fergus is not required at this time. NGGT argued that without investment, they anticipate disruption to supplies at the terminal. NGGT stated that the financial impact would be potential payment of Section I¹² liabilities and higher gas prices for UK consumers.

Equinor shared NGGT's opinion that investment is necessary at this time, stating that the reduction in the resilience of the system needs to be considered along with the asset health of the compressors from a capability point of view. Centrica stated that the needs case should be assessed as part of the RIIO-T2 price control view once NGGT have completed its review of Network Capability and finalised its long-term compressor fleet strategy.

Hatton specific responses

Centrica commented that the need for investment at Hatton should be underpinned by the findings of the Network Capability review as it is currently unclear whether maintaining the existing capability and resilience at the site is efficient.

NGGT agreed with our view that new investment at Hatton is needed at this time to maintain the existing capability and resilience at the site, noting the importance of 1-in-20 compliance and efficient system operation.

In response to our initial view that NGGT have not sufficiently demonstrated that the current proposed solution at Hatton is the most economically viable option, NGGT explored alternative options to find the most economical solution at Hatton. Their response to our

¹² If NGGT cannot supply compression capability to NSMP, constraint costs will be incurred as defined by Section I of the Uniform Network Code.

consultation outlined the ability to modify the compressor envelope(s) for another option, which it referred to as “the Epsilon option”, allowing them to operate with the existing VSD, resulting in this option becoming the preferred option for NGGT. NGGT presented cost estimates for installing the Epsilon (new unit(s)) Option (£61m), an RB211 sized new unit (£60m) and an RB211 retrofit solution (£46m plus potential £10m for SCR and Oxidation Catalyst) using an existing compressor plinth at the site.

Our decision

Having considered responses to our consultation, we have reached a decision on all areas of the needs case submission NGGT has put forward for St Fergus and Hatton.

St Fergus

We maintain our view that there is the need to decommission two IED non-compliant RB211 compressor units at St Fergus by 31st December 2023. We will assess the efficient costs for their decommissioning as part of the RIIO-2 price control settlement.

Environmental need

Based on the information available at this time and ongoing engagement with NGGT and SEPA, we have decided that that investment in new compressor units is not needed at this time to comply with environmental legislation, however investment may be required for the 2030 MCP deadline.

SEPA have confirmed that bringing investment forward from the MCP compliance date would not be required under IED. This is because the assessment of BAT requires costs and benefits to be balanced when investing to reduce emissions.

Technical need

Based on our assessment of the information provided by NGGT in its needs case submission and by respondents to our consultation, we do not consider there is a technical need to invest in new compressor units at St Fergus prior to 2030.

The decommissioning of the RB211s at St Fergus will return the site to a compressor capacity level equivalent to the level which was before the installation of the VSDs in 2015. This configuration was able to meet peak gas flows in the past. All industry-modelled future of gas scenarios show a downward trend in the peak and average gas flows over the next 25 years.

Some consultation responses we received indicated that new North Sea gas fields could lead to increases in gas flows through St Fergus. Currently no such increases are evident in the Future Energy Scenarios developed by the Energy System Operator (ESO), which NGGT has presented as its best view of the long term capacity need at St Fergus.

If the VSD availability is raised from NGGT's initial assumption of 78% to 90%, NGGT's modelling shows that total Section I constraint costs likely to be incurred between 2024 and 2030 will be less than £2m. We would not consider it to be proportionate to install new compressor units to mitigate constraint risk of this magnitude. Instead, NGGT should be maintaining and operating the existing equipment at St Fergus efficiently to ensure availability at times of peak supply.

In its consultation response, NGGT stated that, in the absence of new compressor units, significant asset health works would be required to guarantee availability of the Avon units at St Fergus. The costs presented are equivalent to the cost of installing new compressor units, and as such move the CBAs in favour of constructing new units. However, NGGT did not present any new or more robust information suggesting that the Avon fleet at the site is in a state of deterioration. Given the spend throughout RIIO-T1 on asset health at St Fergus, we would not expect such significant refurbishment work to be required. Therefore, we do not consider that the asset health costs presented have been fully justified.

We would expect NGGT to present a joined up approach to compliance with MCP regulations and asset maintenance at St Fergus as part of its business plan for RIIO-2 price control.¹³ This should:

- Highlight where refurbishment has taken place in RIIO-T1, giving a clear timeline of servicing and overhauls to the existing compressor fleet at the site; and
- Demonstrate an efficient plan for running the Avons at the site before derogation or decommission under the MCP deadline in 2030.

Hatton

We have decided that there is the need to decommission two IED non-compliant RB211 compressor units at Hatton by 31st December 2023. We will assess the efficient costs for their decommissioning as part of the RIIO-2 price control settlement.

Based on consultation responses received and ongoing engagement with NGGT and the Environmental Agency (EA), we have decided that investment in new compression

¹³ NGGT is expected to submit its business plan for RIIO-2 price control on 9th December 2019.

capability is required at Hatton to give the site resilience once the RB211s on Limited Lifetime Derogation (LLD)¹⁴ have been decommissioned.

As requested in our consultation, NGGT explored single unit and retrofit options at Hatton, and provided this analysis in response to our consultation.

Epsilon option

The new preferred (Epsilon) option presented by NGGT would be £16m cheaper in capital costs compared with the initial preferred solution, whilst delivering equivalent compression capability.

In its consultation response, NGGT presented costs for a brownfield build at Hatton using the existing RB211 compressor plinths. Although the figures provided reflect a desk study rather than a full engineering design cost, they suggest £15m of savings may be possible. Combined with the abovementioned reduction in capital costs, we understand that the new preferred solution may include capital costs of £61m compared to the initial £90m.

NGGT stated that building a new compressor using the existing plinths is difficult due to proximity of the compressor units to the control room. Our understanding is that this could potentially be overcome with engineering solutions, such as moving the site control room or the construction of blast walls but these have not yet been considered. We therefore expect NGGT to develop a cost effective build strategy with consideration given to greenfield vs brownfield build. This will require some engineering costs be incurred up front, but this is reasonable given the routine nature of the option and the potential for £15m of capex savings to be realised.

Retrofit option

Our discussions with the EA have indicated that if a large combustion plant is replaced due to having come to the end of its scheduled operating life, the EA would require that the new plant standards are met across the board, i.e. not just emission standards (e.g. through adding abatement) but also in terms of energy efficiency and raw material use. Given this consideration, it would not be considered BAT to retrofit a RB211 turbine unit with abatement as a replacement for an end of life combustion plant.

Interaction with Network Capability

¹⁴ Some plants affected by IED are permitted to operate under Limited Lifetime Derogation, which permits them to run for up to 17,500 hours before decommissioning by 31/12/2023

Centrica raised a concern that the outcome of the Network Capability work should be considered before making a decision at St Fergus. We agree that this is a valid concern, but St Fergus doesn't interact with any other compressor site on the network. The site is unique in providing compression capability from approximately 42 bar to NTS pressures (approximately 70 bar). Our view is that the current and future need at the site can be considered in isolation from the rest of the network. Hence, we believe it is appropriate to make a decision based on the information provided in NGGT's needs case submission.

Centrica's comment regarding the interaction with Network Capability is more relevant for Hatton where there is a strong interaction with a number of other sites on the NTS. The interactions with other sites were demonstrated in the submission with wider modelling of the network used to identify and monetise the risks of not investing at Hatton (referred to as the cluster analysis). NGGT's view is that Hatton forms the backbone of the NTS and investment at the site is necessary to avoid investment at three other sites. We have accepted that Hatton is a necessary site for investment given its roles on the NTS. Centrica's comment has merit for the RIIO-2 plan where other compressor investment is being put forward and we expect NGGT to fully consider the Network Capability work when developing this plan.

Next steps

Our decision on NGGT's application under this submission does not result in any adjustments to NGGT's allowed revenues. We agree to work with NGGT to review the needs case and preferred solution for IED emissions compliance at Hatton as part of the RIIO-2 price control settlement. We will assess funding as part of that process.

Please contact Charlotte Friel (Charlotte.Friel@ofgem.gov.uk) if you would like to discuss any aspect of this letter.

Yours faithfully,

Min Zhu
Deputy Director, Network Price Controls