









UNC Modification	At what stage is this document in the process?
<h1 data-bbox="132 322 657 414">UNC 0870:</h1> <h2 data-bbox="129 450 1142 663">Amendments to Wobbe Index and Calorific Value Lower Limits at NTS System Entry Points</h2>	<div data-bbox="1209 309 1468 627"> <div data-bbox="1209 309 1468 383">01 Modification</div> <div data-bbox="1209 389 1468 463">02 Workgroup Report</div> <div data-bbox="1209 470 1468 544">03 Draft Modification Report</div> <div data-bbox="1209 551 1468 627">04 Final Modification Report</div> </div>
<p data-bbox="129 707 507 745">Purpose of Modification:</p> <p data-bbox="129 763 1452 880">To enable implementation of a reduction in the lower limit for Wobbe Index and Calorific Value (CV) at some NTS System Entry Points following the Government’s decision to reduce the lower Wobbe limit in UK legislation.</p>	
<p data-bbox="129 925 308 963">Next Steps:</p> <p data-bbox="129 981 979 1019">The Proposer recommends that this Modification should be:</p> <ul data-bbox="153 1037 1145 1120" style="list-style-type: none"> considered a material change and not subject to Self-Governance assessed by a Workgroup <p data-bbox="129 1135 1393 1207">This Modification will be presented by the Proposer to the Panel on 21 March 2024. The Panel will consider the Proposer’s recommendation and determine the appropriate route.</p>	
<p data-bbox="129 1254 399 1292">Impacted Parties:</p> <p data-bbox="129 1305 1236 1344">High: NTS Terminal Operators, National Gas, CCGT operators, NTS shippers</p> <p data-bbox="129 1359 647 1397">Low: Distribution Network Operators</p>	
<p data-bbox="129 1440 389 1478">Impacted Codes:</p> <p data-bbox="129 1503 217 1541">None.</p>	

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Timetable		
Modification timetable:		
Pre-Modification Discussed	07 March 2024	
Date Modification Raised	11 March 2024	
New Modification to be considered by Panel	21 March 2024	
First Workgroup Meeting	04 April 2024	
Workgroup Report to be presented to Panel	19 September 2024	
Draft Modification Report issued for consultation	20 September 2024	
Consultation Close-out for representations	11 October 2024	
Final Modification Report available for Panel	13 November 2024	
Modification Panel recommendation	21 November 2024	
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1 Summary

What

This Modification is needed to enable implementation of a recent change in legislation pertaining to the lower limit for Wobbe Index for which a regulatory impact assessment has already been completed. The Gas Safety (Management) (Amendment) Regulations 2023 entered into force on 6th April 2023 which reduced the lower limit for Wobbe Index that UK gas transporters are permitted to convey on their networks from 47.2 MJ/m³ to 46.5 MJ/m³ with effect from April 2025.

Consequently, some Delivery Facility Operators wish to amend their Network Entry Provisions in their connection agreement with NGT. The UNC requires NGT to consult with Users prior to any such contractual amendments being executed, hence NGT has raised this 'enabling' Modification.

Why

A review of the gas quality specification that is contained within the Gas Safety (Management) Regulations 1996 (GS(M)R) began in 2016 and culminated in a public consultation and impact assessment conducted by the HSE. HSE reported its conclusions in March 2023 and the GS(M)R were amended by Parliament shortly afterwards.

The combustion parameters within Schedule 3 of the GS(M)R were central to this review. Replacement of the Incomplete Combustion Factor and Soot Index parameters with Relative Density took immediate effect, whilst a lead-time to April 2025 was provided for the reduction in the lower limit for Wobbe Index.

To realise the identified benefits of this change in legislation, Network Entry Agreements need to be modified to permit wider specification gas to enter the NTS, for which the UNC requires consultation with Users as a pre-requisite.

National Gas Transmission (NGT) has engaged with all NTS Delivery Facility Operators to establish which of them wish to implement a lower Wobbe Index limit in their entry arrangements with NGT. This Modification captures all those that responded positively and have confirmed the value they wish to reduce to. Should any other operator that delivers gas to the NTS wish to implement a reduced lower limit for Wobbe Index in the future, a separate UNC Modification would be required.

How

In accordance with UNC TPD section I2.2.3(a) and based on the wishes of some Delivery Facility Operators, NGT is seeking to amend the lower limit for Wobbe Index, and consequently, in respect of some NTS System Entry Points, the lower limit for calorific value, in several of its connection agreements with operators via this Modification. If this Modification is implemented, NGT will be able to make these amendments with the counterparties to these agreements. Once each agreement change is executed, NGT shall notify all Users consistent with its obligation in UNC TPD section I2.2.6(a).

NGT recognises (as did the HSE within its impact assessment)¹ that implementation of a wider Wobbe Index has the potential to impact the operations of some industrial and commercial consumers, notably CCGT operators. NGT is therefore proposing a discussion with industry within the development Workgroup for this Modification to determine what additional gas quality information can be made available for consumers that are sensitive to variation in Wobbe Index and CV that would assist with the mitigation of such risks.

¹ [HSE Impact Assessment](#)

2 Governance

Justification for Authority Direction

Implementation of this Modification could have a material effect on existing or future industrial and commercial gas consumers.

This Modification seeks to implement a change at some NTS System Entry Points that the Government has already approved following public consultation led by the HSE. The HSE's Consultation Response document² to its public consultation and impact assessment on the GS(M)R reforms recognised that with the introduction of a reduced lower limit for Wobbe Index, *"some equipment would need to be adapted and gas turbines could need additional tuning and maintenance. The impact assessment also outlined how the largest costs would be borne by power-generators. In assessing these costs, it was important to consider the degree of network penetration of any new lower Wobbe Index gas that would be enabled by the change"*.

In pre-Modification discussions, some stakeholders in the power generation sector have indicated that exposure to a wider range of Wobbe Index gas could impact their operations and, consequently, their participation in the electricity market. NGT is aware that this issue is relevant both within the UK and in respect of Ireland, whose gas, in large majority, is supplied through the Moffat interconnector. NGT therefore proposes that the development Workgroup for this Modification considers how the provision of additional gas quality information could enable such risks to be mitigated.

This Modification could have a material effect in respect of commercial activities related to, the shipping, transportation or supply of gas.

Implementation of a 46.5 MJ/m³ lower Wobbe limit at the Bacton Perenco System Entry Point could, in some circumstances, result in NGT making gas available to the interconnectors with a Wobbe Index below the current contracted minimum of 47.2 MJ/m³ when they are exporting gas to the continent. This could be a barrier to cross border flow with the EU because a 47.2 MJ/m³ specification also applies at the Belgian (Zeebrugge) and Dutch (Balgzand) end of the interconnectors. NGT has been working with the Bacton interconnector operators and relevant EU TSOs to assess this risk and develop a solution, the detail of which will be shared with the Workgroup.

Previous 'enabling' UNC Modifications have been raised to facilitate a change in specification at one specific NTS entry point. This is the first time that such a Modification has been raised to facilitate a change in gas quality specification at multiple points because the GS(M)R have not been reviewed before. NGT considers that one enabling Modification covering all NTS Delivery Facility Operators that want to change is a more efficient change process that individual Modifications for individual sites.

Requested Next Steps

This Modification should:

- be considered a material change and not subject to Self-Governance.
- be assessed by a Workgroup.

² [HSE Consultation Response](#), p.10

3 Why Change?

The driver for this Modification is the review of the gas quality specification within GS(M)R that was conducted between 2016 and 2023. One conclusion from this review was that the lower limit for Wobbe Index that UK gas transporters may convey in their networks should be amended from 47.2 MJ/m³ to 46.5 MJ/m³ with effect from April 2025, which is now enacted in the Gas Safety (Management) (Amendment) Regulations 2023.

This change in legislation allows (but does not compel) NGT to agree a reduction in the Wobbe Index lower limit with Delivery Facility Operators (DFOs) that deliver gas to the NTS. In anticipation of this change, NGT engaged with all such DFOs, including interconnector operators, to determine whether they would want to implement this change at their entry point. Five DFOs stated that they wished to do so and since confirmed the limit they wish to reduce to which are listed below, together with their rationale for change.

NTS System Entry Points

Entry Point	Rationale
Bacton Perenco	<p>This terminal receives gas from a number of Southern North Sea fields including the Cygnus field. Cygnus gas has a Wobbe Index in the range of 46.5 to 46.8 MJ/m³ and at present is reliant on blending with higher Wobbe Index fields to enable flow into the NTS. An automated gas quality control system is employed in the Perenco terminal which reduces or shuts in Cygnus flow in the event of reduction in or loss of blend gas sources. This is the single largest cause of loss of gas supply from Cygnus over its field life.</p> <p>A reduction in the lower Wobbe limit between NGT and Perenco is therefore expected to significantly reduce, if not eliminate, the dependence of Cygnus on other sources of gas, thereby improving its resilience and ability to reliably supply gas to the United Kingdom for years to come.</p>
Barrow	<p>Spirit Energy's terminal at Barrow receives gas from the North Morecambe, South Morecambe, Rhyl and Calder fields.</p> <p>Under normal operation with all fields flowing, gas is delivered to the NTS with a Wobbe Index of ~48.5 MJ/m³, however when only South Morecambe is flowing due to the others being on outage, the Wobbe Index drops. Under such circumstances, production has to be shut down and later re-started when other fields return from outage because there is no capability to recycle gas within the terminal, which itself can generate gas quality excursions. Access to a lower Wobbe limit would avoid this and enable continuous production in these circumstances from the South Morecambe field. In addition, the Nitrogen Rejection Unit at the terminal is a complex cryogenic process that requires shutting down without the terminal exporting gas. This has variable periods required for restart based on the duration the terminal is offline, which protracts the terminal restart.</p>
Grain LNG	<p>Under steady state operation, the send-out of gas from the Grain terminal into the NTS tends to be at the higher end of the Wobbe Index range for which nitrogen ballasting plant is employed when required to avoid a breach of the upper limit. However, at low flow rates when the vapourisers are starting up or shutting down, or if other plant at the terminal trips, the Wobbe Index and CV can drop below the current lower limits. Such events are infrequent (estimated 4-5 times per year) and short duration (< 10 minutes) although this is still sufficient time for an off-specification reading to be measured on the gas analyser to be picked up by NGT, and a</p>

	<p>Transportation Flow Advice (TFA) to be generated curtailing Grain’s flow which can disrupt operations for several hours.</p> <p>Access to a lower Wobbe and CV limit would therefore remove this disruption risk at low flow rates.</p>
St Fergus NSMP	<p>The St Fergus NSMP terminal (operated by Px) delivers gas to the NTS from a number of different fields with different gas quality specifications. There is no requirement for a lower Wobbe Index or CV limit under steady state production, but it would be useful if there are extended trips to processing plant onshore or planned outages of the lower CO₂ / higher Wobbe fields to allow higher CO₂ / lower Wobbe fields to continue producing.</p>
Teesside Px	<p>The TGPP terminal at Teesside processes gas via two trains; Train 1 receives gas from the Braegh field, which is low Wobbe gas, Train 2 processes gas from the CATS pipeline which is higher Wobbe gas. The two streams blend ahead of a common entry point to the NTS and this arrangement is planned to continue if a lower Wobbe limit were to be implemented.</p> <p>A lower Wobbe and CV limit would allow the terminal to continue to flow gas if Train 2 tripped and could also provide flexibility for managing planned outages of higher Wobbe fields.</p>

Interconnectors

The Interconnection Agreements (IAs) that NGT has with Interconnector and BBL currently specify a lower Wobbe limit for NTS entry and NTS exit of 47.2 MJ/m³ which aligns with the specification at the continental end of these pipelines at Balgzand and Zeebrugge. Such alignment is essential for Interconnector and BBL to avoid the risk of stranded gas in their pipelines.

When the interconnectors are exporting, depending on the operational scenario at the time, they may receive gas from the UKCS supplies at Bacton, gas from within the NTS or a combination of the two. In the first scenario, NGT would normally expect this gas to constitute a blend of gases from the Shell, SEAL and Perenco terminals which would be above 47.2 MJ/m³. However, if Perenco were delivering gas with a Wobbe Index in the range 46.5 – 47.1 MJ/m³ (as would be their right if this Modification is approved and Perenco’s Wobbe entry specification is amended to a lower limit of 46.5 MJ/m³) and there was insufficient higher Wobbe gas to blend within the NGT Bacton terminal, it is possible that NGT would make gas available for offtake to the interconnectors that would breach the current lower limit values.

Interconnector and BBL are currently not able to agree to a reduced lower limit value for Wobbe Index in their IA with NGT unless similar changes are applied in Belgium, the Netherlands and at interconnection points with other EU TSOs. NGT has engaged with all the relevant TSOs to explore potential solutions to this interoperability issue and in principle, agreement has been reached to ‘harmonise’ the lower Wobbe Index at a limit of 46.8 MJ/m³, which in NGT’s view would all but eliminate the risk. NGT will share its analysis on this issue and what needs to happen in parallel with the development of this Modification with the Workgroup. NGT regards amendment to the relevant continental specifications and corresponding changes to the interconnector specifications as a pre-requisite for amendment to Perenco’s Wobbe specification at Bacton.

Storage Facilities

If a lower Wobbe limit applies at some of the NTS System Entry Points, sub 47.2 MJ/m³ Wobbe gas could potentially be made available by NGT for offtake by storage operators at storage facilities. There is therefore a question about whether the NTS entry specifications for gas quality that apply in Storage Connection Agreements (SCAs) require amendment.

The SCAs provide that where gas is offtaken for injection into storage that is outside the facility's entry specification but is within the GS(M)R limits, then the entry specification shall be equal to the GS(M)R limits. Therefore, rather than change every SCA, it may be more appropriate for NGT to provide a 'letter of comfort' to storage operators referencing this provision (as has been discussed at the pre-Modification stage) providing assurance that low Wobbe gas reintroduced to the NTS would not be rejected by NGT.

Gas Quality Transparency

Change to gas quality specification is one thing, actual gas quality delivered is another. NGT's current expectation is that delivery of gas into the NTS with a Wobbe Index in the range of 46.5 – 47.2 MJ/m³ at most of the NTS System Entry Points that are within scope of this Modification will be the exception for short periods at a time rather than the norm on an enduring basis for the foreseeable future. However, we also recognise that agreeing a wider contractual Wobbe range with some DFOs will be of concern to some of our exit stakeholders, particularly those who operate gas fired generation plants.

We therefore wish to discuss with the development Workgroup proportionate measures that could be deployed to increase gas quality data transparency to enable relevant exit stakeholders to manage any perceived increased operational risks. This could include publication of CV and Wobbe data at suitable system points, and/or forward-looking NGT network analysis ('heat maps') to indicate where in the country low Wobbe gas could potentially arise.

4 Code Specific Matters

Reference Documents

[HSE Impact Assessment – GS\(M\)R Review](#)

[HSE Conclusions Report – GS\(M\)R Review](#)

Previous NGT ['heat map' analysis](#)

[Gas Safety \(Management\) Regulations 1996 \(legislation.gov.uk\)](#)

[The Gas Safety \(Management\) \(Amendment\) Regulations 2023 \(legislation.gov.uk\)](#)

NGT document [Guidance for Changing an Existing NTS Entry Gas Quality Parameter](#)

Knowledge/Skills

An awareness of gas quality and how it features in NTS entry arrangements would be useful.

5 Solution

By this Modification, NGT shall be enabled to execute contractual amendments to the following gas quality parameters contained within the Network Entry Provisions that are in place with the following Delivery Facility Operators in respect of the following NTS System Entry Points:

NTS System Entry Point	Current Wobbe Index lower limit (MJ/m ³)	Amended Wobbe Index lower limit (MJ/m ³)	Current CV limit (MJ/m ³)	Amended CV limit (MJ/m ³)
Bacton Perenco	47.2	46.5	No Change	
Barrow	47.2	46.5	No Change	
Grain LNG	47.2	46.5	36.9	36.0
St Fergus NSMP	47.2	46.5	36.9	36.0
Teesside Px	47.2	46.5	36.9	36.0

By this Modification, NGT shall be enabled to execute contractual amendments to the following gas quality parameters contained within the Network Entry Provisions and Network Exit Provisions that are in place with the following Adjacent TSOs in respect of the following Interconnection Points at Bacton:

Interconnection Point	Current NTS Entry Wobbe Index lower limit (MJ/m ³)	Amended NTS Entry Wobbe Index lower limit (MJ/m ³)	Current NTS Exit Wobbe Index lower limit (MJ/m ³)	Amended NTS Exit Wobbe Index lower limit (MJ/m ³)
BBL	47.2	46.8	47.2	46.8
Interconnector	47.2	46.8	47.2	46.8

6 Impacts & Other Considerations

Does this Modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?

No.

Consumer Impacts

The HSE’s conclusions report from its GS(M)R Review identified a positive net present value, benefits to UK gas consumers from improved energy resilience and impacts for power generation.

“The consultation has shown that the impacts of this proposal are greatest on the power generation sector. Power generators will incur large costs as a result of this change and outages in generation are predicted for power generators burning gas to generate electricity. Research on the magnitude of this issue has been undertaken by HSE Science Division, BEIS and Ofgem and whilst it has not been possible to assess or quantify the impact on electricity security of supply or electricity prices, the consensus is that the change will not lead to significant wholesale power outages, or prolonged or frequent wholesale power outages. Mitigations to limit these impacts have been considered as part of the policy development and will be implemented through the

amended legislation. With gas prices, the analysis of responses and evidence obtained is that this proposal will not alter the price of gas, so no benefit is obtained in terms of cost of living. The HSE’s impact assessment has concluded that the admission of gas into the GB networks with a Wobbe Index down to 46.5 MJ/m³ will not result in any detrimental impacts to safety in transportation or consumer appliance operation and is expected to benefit the security of supply position for consumers”.³

NGT recognises the uncertainty that CCGT operators will face as a result of this Modification about whether the implementation of a wider Wobbe Index and CV range at some NTS System Entry Points will result in wider specification gas actually being made available for offtake at gas fired power stations. As stated earlier in this Modification, NGT wishes to explore suitable transparency measures during this Modification’s development period.

What is the current consumer experience and what would the new consumer experience be?

The impact of this Modification would be to potentially widen the range of Wobbe Index and CV in the gas that some consumers offtake. Based on the information provided to NGT by the DFOs that wish to implement a lower Wobbe Index limit and NGT’s previous [‘heat map’ analysis](#), most consumers will not experience this. If the Modification is not implemented then there would be no change to the consumer experience although the identified benefits from the GS(M)R Review to the security and resilience of gas supply to GB consumers would not be realised.

Impact of the change on Consumer Benefit Areas:	
Area	Identified impact
<p>Improved safety and reliability</p> <p>HSE’s impact assessment concluded that a reduction in the lower Wobbe limit should improve GB’s energy resilience. NGT’s understanding from pre-modification discussions held with relevant DFOs is that implementation of lower Wobbe limits at NTS entry points will enable gas to enter the NTS that today requires blending with a richer source(s) to make it acceptable, which NGT considers would enhance the reliability of customer supplies. HSE has already concluded that this change would have no detrimental impacts on safety.</p> <p>As referenced elsewhere in this Modification, we are aware of potential challenges with the operation of CCGT plant if such sites consume gas with a more variable Wobbe Index which could negatively impact electricity generation capability, hence the need to consider appropriate mitigations. HSE’s conclusion in summary was: <i>“the consensus is that the change will not lead to significant wholesale power outages, or prolonged or frequent wholesale power outages.”</i>⁴</p>	Positive

³ [HSE Conclusions](#), p. 3

⁴ [HSE Conclusions](#), p. 3

<p>Lower bills than would otherwise be the case</p> <p>HSE concluded: “<i>With gas prices, the analysis of responses and evidence obtained is that this proposal will not alter the price of gas, so no benefit is obtained in terms of cost of living</i>” and “<i>...it has not been possible to assess or quantify the impact on electricity security of supply or electricity prices.</i>”⁵</p>	<p>None</p>
<p>Reduced environmental damage</p> <p>HSE concluded that the proposed change would have a positive influence on emissions emanating from gas production from the UK Continental Shelf and that lower Wobbe gas could be expected to reduce Nitrous Oxide production at the point of use⁶. NGT considers that there is potential for this Modification to result in a reduction in the requirements for gas processing prior to NTS entry and thereby reduce emissions of greenhouse gases.</p>	<p>Positive</p>
<p>Improved quality of service</p> <p>No impact identified.</p>	<p>None</p>
<p>Benefits for society as a whole</p> <p>In its decision to implement the reduction in the lower limit for Wobbe Index into the GS(M)R, the HSE concluded:</p> <p><i>“The benefits of making this change are substantial. In economic terms the value of the additional gas that may be supplied as a consequence of this change results in a net present value for the proposed legislative changes, and in terms of contributing to important strategic goals for the government it helps to improve energy resilience and increase United Kingdom supply of gas. HSE has worked closely with BEIS to assess the impact of the change on our energy system, who have recommended that the additional gas and increased production confidence that changing the lower WN limit would bring is beneficial to our energy independence and in delivering the original policy objective of this review.”</i>⁷</p>	<p>Positive</p>

Performance Assurance Considerations

No impact identified.

Cross-Code Impacts

None.

EU Code Impacts

No impacts. Whilst engagement is needed with the Bacton interconnector operators and EU TSOs to realise change at all the entry points contained in this Modification, EU Codes do not contain limitations on the Wobbe Index of gas that may be conveyed in gas transportation networks.

⁵ [HSE Conclusions](#), p. 3

⁶ [HSE Conclusions](#), p. 21

⁷ [hseconsultationresponseforgsmr2023.pdf](#), p. 3

Central Systems Impacts

No impact on central systems would result from this Modification. Changes to alarm limits within NGT's Gas Control System (GCS) and SCADA systems would be required in respect of each NTS System Entry Point where the gas quality specification changes.

7 Relevant Objectives

Impact of the Modification on the Transporters' Relevant Objectives:

Relevant Objective	Identified impact
a) Efficient and economic operation of the pipe-line system.	Positive
b) Coordinated, efficient and economic operation of (i) the combined pipe-line system, and/ or (ii) the pipe-line system of one or more other relevant gas transporters.	None
c) Efficient discharge of the licensee's obligations.	None
d) Securing of effective competition: (i) between relevant shippers; (ii) between relevant suppliers; and/or (iii) between DN operators (who have entered into transportation arrangements with other relevant gas transporters) and relevant shippers.	Positive
e) Provision of reasonable economic incentives for relevant suppliers to secure that the domestic customer supply security standards... are satisfied as respects the availability of gas to their domestic customers.	None
f) Promotion of efficiency in the implementation and administration of the Code.	None
g) Compliance with the Regulation and any relevant legally binding decisions of the European Commission and/or the Agency for the Co-operation of Energy Regulators.	None

Relevant Objective (a) 'Efficient and economic operation of the pipe-line system'

This Modification will facilitate additional volumes of gas to be transported through the existing network infrastructure than would otherwise be the case and reduces the reliance of low Wobbe gas on richer blend sources.

Relevant Objective (d) 'Securing of effective competition between relevant shippers'

This Modification will facilitate greater flexibility in the transportation of gas by allowing more supplies to be eligible to enter the NTS. Maximising gas delivery capability and greater supply diversity could result in more shippers delivering gas to the NTS, thereby improving competition in the GB gas market.

8 Implementation

No specific implementation date is proposed because the UNC itself will not be changing as a result of this Modification. However, it may be assumed that relevant DFOs will want to implement the changes to their entry specification in April 2025 or as soon as possible thereafter, therefore an Authority decision on this Modification in February 2025 would be desirable.

9 Legal Text

This is an enabling Modification therefore no UNC legal text is required.

10 Recommendations

Proposer's Recommendation to Panel

Panel is asked to:

- Agree that Authority Direction should apply.
- Refer this proposal to a Workgroup for assessment.