














UNC Modification	At what stage is this document in the process?
<h1>UNC 0645S:</h1> <h2>Amending the oxygen content limit in the Network Entry Agreement at South Hook LNG</h2>	<div style="display: flex; flex-direction: column; gap: 5px;"> <div style="border: 1px solid #ccc; padding: 2px; display: flex; align-items: center; gap: 5px;"> 01 Modification </div> <div style="border: 1px solid #ccc; padding: 2px; display: flex; align-items: center; gap: 5px;"> 02 Workgroup Report </div> <div style="border: 1px solid #ccc; padding: 2px; display: flex; align-items: center; gap: 5px;"> 03 Draft Modification Report </div> <div style="border: 1px solid #ccc; padding: 2px; display: flex; align-items: center; gap: 5px;"> 04 Final Modification Report </div> </div>
<p>Purpose of Modification: This Modification will enable an increase to the oxygen content limit of gas permitted by the Network Entry Agreement at South Hook LNG.</p>	
	<p>The Workgroup recommends that this modification should be:</p> <ul style="list-style-type: none"> subject to self-governance <p>The Panel will consider this Workgroup Report on 15 March 2018. The Panel will consider the recommendations and determine the appropriate next steps.</p>
	<p>High Impact: None</p>
	<p>Medium Impact: None</p>
	<p>Low Impact: Transporters, consumers</p>

Contents		?	Any questions?
1	Summary	3	Contact: Joint Office of Gas Transporters
2	Governance	4	
3	Why Change?	4	
4	Code Specific Matters	5	 enquiries@gasgovernance.co.uk
5	Solution	5	 0121 288 2107
6	Impacts & Other Considerations	5	Proposer: Sinead Obeng South Hook Gas Limited
7	Relevant Objectives	8	 sobeng@southhookgas.com
8	Implementation	9	 02072 3403505
9	Legal Text	9	Transporter: National Grid NTS
10	Recommendations	9	 philip.hobbins@nationalgrid.com
1 Timetable			 telephone: 01926 653432
The Proposer recommends the following timetable:			Systems Provider: Xoserve
Initial consideration by Workgroup	08 February 2018		 commercial.enquiries@xoserve.com
Workgroup Report presented to Panel	15 March 2018		Other: Insert name
Draft Modification Report issued for consultation	15 March 2018		 email address
Consultation Close-out for representations	05 April 2018		 telephone
Final Modification Report available for Panel	09 April 2018		
Modification Panel decision	19 April 2018		

2 Summary

What

In Great Britain, there are two oxygen limits that are pertinent to network entry requirements. The first 2000ppm (0.2mol%) is a safety limit specified in Schedule 3 Part 1 (regulation 8) of the Gas Safety (Management) Regulations. The second is a guideline limit of 10ppm (0.001mol%) contained in National Grid's Gas Ten Year Statement, which is currently in place in the South Hook LNG National Grid Network Entry Agreement (NEA).

This limit was applied at the nearby Dynevor Arms LNG storage facility in South Wales to mitigate the potential for water formation within the molecular sieves. At LNG storage sites, part of the liquefaction process prior to injection was to remove components in the gas offtake from the NTS that would otherwise freeze using molecular sieves. The presence of up to 0.2mol% oxygen in the gas would have therefore reduced the performance of that process and limited the life of those assets.

Why

GS(M)R (1996) allows for maximum O₂ levels of 2000ppm (0.2 mol%), however the current oxygen content limits set out in the Network Entry Agreement (NEA) at South Hook LNG Terminal are set at 10ppm (0.001mol%).

A small level of oxygen breakthrough from the Nitrogen Generation Unit (NGU) at the terminal can cause the 10ppm limit to be breached. As the source of the oxygen contamination is the NGU, the nitrogen ballasting must be reduced to rectify the fault with the NGU. The reduction in ballasting-nitrogen can subsequently cause a breach in the Incomplete Combustion Factor (ICF) specification limit.

When South Hook LNG came onstream at the nearby Milford Haven Entry point, the same 10ppm oxygen limit was applied in the South Hook LNG - National Grid NEA, to mitigate against the aforementioned issues at the Dynevor Arms LNG storage facility. Now the facility is obsolete, there is no longer a requirement for the strict oxygen limit. The proposer believes this limit is unnecessary and restrictive to the efficient operation of South Hook LNG terminal.

How

The proposal is to increase the limit for oxygen, as defined within the South Hook LNG NEA from the current limit of 0.001 mol% (10 ppm), to 0.02 mol% (200ppm). The proposed value falls well within the Gas Safety (Management) Regulation limit of 0.2 mol% (2000ppm). Pursuant to UNC TPD I2.2 this Modification, if approved, will enable a change to the South Hook LNG NEA.

It should be noted that similar enabling Modifications, [0561S "Amendment to the Oxygen Limit within the BBL/NTS Interconnection Agreement"](#) and [0581S "Amending the Oxygen content limit specified in the Network Entry Agreements at Grain LNG"](#) were approved by the UNC Modification Panel in November 2015 and July 2016 respectively and were both implemented under self-governance arrangements. An oxygen content limit of 200ppm (0.02 mol%) was agreed for both Modifications.

3 Governance

Justification for Self-Governance

Based on two previous Modifications enabling a change to the same O₂ limit, the Proposer believes this is not likely to have a material effect on the self-governance criteria.

There is no discrimination between any of these parties. Gas quality limits vary at different entry points and given Modifications 0561S and 0581S have been approved, this proposal isn't expected to materially change the current position in relation to discrimination between parties.

Requested Next Steps

This modification should be subject to self-governance procedures and be assessed by a Workgroup.

4 Why Change?

De-risking the probability of an Incomplete Combustion Factor (ICF) breach

As explained above, the nitrogen ballasting from the NGU is used to keep the ICF within its specification limit. If there is an oxygen excursion on the NGU this causes the send-out oxygen to go off-specification if the nitrogen ballasting is not sufficiently reduced, in turn possibly causing an ICF specification breach. An increase in send-out oxygen limit would provide more room for an NGU oxygen excursion, allowing the nitrogen ballasting to continue at a higher rate and a reduced probability of a subsequent ICF excursion.

Security of supply

The ability of a Delivery Facility Operator (DFO) to deliver gas to the NTS at an entry point (or subterminal) is limited by the Network Entry Provisions contained in the relevant Network Entry Agreement (NEA) between the DFO and the relevant gas transporter. Amongst other things, the NEA will set a limit on the oxygen content of the gas to be delivered to the gas transporter's system, which is currently set at 0.001 mol% in South Hook LNG's NEA with National Grid.

As illustrated in [National Grid FES scenarios](#), import dependency is expected to increase and with this, GB can expect greater diversity in the gas composition of future cargoes. The current limit at South Hook LNG is at risk of being too restrictive to meet the composition of future cargoes, therefore it is in the interest of the UK gas market to better facilitate the delivery of LNG cargoes at Milford Haven.

The short-term solution to achieving this is to allow a relatively modest increase to 0.02mol% in the oxygen limit at South Hook LNG. The second step in the mid-long term is currently being addressed in the current [IGEM Gas Quality Standard Working Group](#).

Consistency with other entry points O₂ limit

The table below is a summary from Ofgem's letter to industry titled [Establishing a gas quality Review Group](#) dated 20 September 2004 and the proposed new limit of 0.02mol% for the South Hook LNG NEA sits towards the lower end of the of the total number of 21 entry points cited in 2004.

<u>O₂ Content Limit (mol%)</u>	<u># Entry Points</u>	<u>Cumulative # Entry Points</u>
0.001	7	7
0.100	9	17
0.200	4	21

It should be noted that similar enabling Modifications 0561S and 0581s were approved by the UNC Modification Panel in November 2015 and July 2016 respectively and implemented under self-governance arrangements. An identical 0.02 mol% oxygen content limit was agreed for both.

Therefore, this Modification proposal is consistent with similar change requests to NEAs in the past and in accordance with paragraph I2.2.3 (a) of the UNC Transportation Principal Document, a Code Modification has been chosen as the means by which to effect the changes to the oxygen content limits in the South Hook LNG NEA.

What the effects are, should the change not be made

The risk of avoidable ICF exceedances would still remain at South Hook LNG Terminal should the modest change not be made. South Hook LNG may also be disadvantaged in effective competition between other shippers and suppliers that are not subject to such a strict oxygen content limit.

5 Code Specific Matters

Reference Documents

No reference documents.

Knowledge/Skills

No additional knowledge/skills required.

6 Solution

Increase the maximum oxygen limit in the South Hook LNG Network Entry Agreement

The solution to the issue raised in this proposal is to increase the permitted oxygen content of the gas in the South Hook LNG Network Entry Agreement from 0.001 mol% to 0.02 mol%. This increased level would remain well within the level of 0.2 mol% allowable under the Gas Safety (Management) Regulations. It would also appear to be significantly lower than the limits permitted at the majority of other NTS entry points.

7 Impacts & Other Considerations

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

Not applicable.

Consumer Impacts

The proposers' view of consumer impacts was that there were not likely to be any, based on implementation of previous Modifications this enabling Modification is unlikely to have a material impact on consumers whose offtake facilities are sensitive to the level of oxygen content in gas.

Action 0201: NG (in line with previous enabling modification to facilitate oxygen content amendment) to produce a view of the penetration of South Hook Gas into the NTS, providing scenarios and a heat map diagram.

In order to investigate this, the Workgroup asked National Grid to produce appropriate analysis showing penetration of South Hook Gas into the NTS. National Grid produced two 'heat maps' – one for a summer's day and one for a winter's day – which show the degree of penetration of South Hook gas into the NTS based on the latest Future Energy Scenarios (FES) data. This analysis essentially replicated the analysis provided for Modification 0581S.

On 21 February 2018, the Joint Office contacted the Gas Storage Operators Group (GSOG), the Major Energy Users' Council (MEUC); the Energy Intensive Users Group (EIUG) and the Chemical Industries Agency (CIA) groups highlighting this modification and asking for views on the impacts on their members from this proposal.

Heat Map analysis results

To recap, the 0.02 mol% (200ppm) limit would only be needed operationally if...

The heat map analysis results show that higher oxygen levels could potentially penetrate as far as ... when both xxx and yyy conditions occur simultaneously. The likelihood of these conditions being met can be described as

In turn, this means that the likelihood of xxx occurring is yyy.

Workgroup views on Heat map analysis

Some workgroup participants were of the view that the consequence of this change would be unlikely to affect consumers.

However, some workgroup participants were concerned at the potential for higher levels of oxygen penetration into the North West region where several gas storage facilities are situated.

What would be the impact of such levels of oxygen on the affected storage facilities?

Consumer Impact Assessment

(Workgroup assessment of proposer initial view or subsequent information)

Criteria	Extent of Impact
Which Consumer groups are affected?	<p><i>Location of South Hook Gas...</i></p> <p><i>Jeff Chandler text...</i></p> <p><i>Please consider each group and delete if not applicable.</i></p> <ul style="list-style-type: none"> • Domestic Consumers • Small non-domestic Consumers • Large non-domestic Consumers • Very Large Consumers
What costs or benefits will pass through to them?	<p><i>Please explain what costs will ultimately flow through to each Consumer group. If no costs pass through to Consumers, please explain why. Use the General Market Assumptions approved by Panel to express as 'cost per consumer'.</i></p> <p>Insert text here (potential storage effects - refurbishment/closure)</p>
When will these costs/benefits impact upon consumers?	<p>After the UNC modification panel decision, the NEA can be modified. Once this is in place, cargoes with a greater oxygen limit can be accepted at South Hook LNG and the gas can flow into the NTS.</p>
Are there any other Consumer Impacts?	<p><i>Prompts:</i></p> <p><i>Are there any impacts on switching?</i></p> <p><i>Is the provision of information affected?</i></p> <p><i>Are Product Classes affected?</i></p> <p>Insert text here</p>
General Market Assumptions as at December 2016 (to underpin the Costs analysis)	
<i>Number of Domestic consumers</i>	<i>21 million</i>
<i>Number of non-domestic consumers <73,200 kWh/annum</i>	<i>500,000</i>
<i>Number of consumers between 73,200 and 732,000 kWh/annum</i>	<i>250,000</i>
<i>Number of very large consumers >732,000 kWh/annum</i>	<i>26,000</i>

Cross Code Impacts

None.

EU Code Impacts

Action 0203: PH to provide wording for the Workgroup Report specifically TSO actions relating to gas quality specification and cross border flow.

The Workgroup considered whether the provisions of the EU Interoperability Code apply here.

Joint Office of Gas Transporters

Article 15 of this Code requires TSOs to cooperate to avoid restrictions to cross border trade due to gas quality differences. The Workgroup noted that the heat maps produced by National Grid show that under some of the 'summer' scenarios, Milford Haven gas could penetrate across to Bacton. Whilst the specification requested by the Proposer is well within the relevant specification for offtake at Bacton, it is noted that the typical specification for oxygen in North West Europe is 10ppm on a daily average basis.

The Workgroup noted that the EU CEN standard on gas quality currently specifies a limit of 10ppm (0.001mol%) on a daily average basis for oxygen with flexibility to increase this up to 1mol% where it can be demonstrated that the gas will not reach an installation that is sensitive to oxygen content. Whilst the European Commission had previously indicated that it wished to make this standard legally binding on member states, at present there are no plans to do so. The Commission indicated that it would revisit the question of gas quality harmonisation after the inclusion of the Wobbe Index within the standard. The Workgroup considered that the merits of this Modification should not be affected by this potential future step.

Commented [RH1]: Text from PH

Central Systems Impacts

None.

Workgroup Conclusions

xxx

8 Relevant Objectives

Impact of the modification on the Relevant Objectives:

Relevant Objective	Identified impact
a) Efficient and economic operation of the pipe-line system.	None
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

Joint Office of Gas Transporters

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

Positive Impact of Increasing Oxygen Limits

The Proposer believes positive impacts can be identified for objective *d) securing of effective competition between various parties*. Removing unnecessary restrictions on the deliveries of LNG will allow more gas to enter the UK market, improve liquidity and will therefore help to promote competition between gas shippers and gas suppliers.

The workgroup broadly agreed with the proposer's view relating to relevant objective d) relating to competition in that more gas could potentially be delivered onto the system.

(subject to results of analysis)

9 Implementation

As self-governance procedures are proposed, implementation could be sixteen business days after the Modification Panel 15 March 2018 if the Panel decides to implement the proposal, subject to no Appeal being raised.

10 Legal Text

As this is an enabling Modification, no UNC text changes are requested.

11 Recommendations

Workgroup's Recommendation to Panel

The Workgroup asks Panel to agree that:

- This self-governance modification should proceed to consultation.
- ~~This proposal requires further assessment and should be returned to Workgroup.~~

