Modification proposal:	**Uniform Network Code (UNC) 0780: Amendment to Gas Quality NTS Entry Specification at the St Fergus SAGE System Entry Point (UNC 0780)**		
Decision:	The Authority[1] directs this modification be made[2]		
Target audience:	UNC Panel, Parties to the UNC and other interested parties		
Date of publication:	21 April 2022	Implementation date:	6 May 2022

Background

SAGE North Sea Limited (SNSL) sub-terminal at St. Fergus receives gas from numerous offshore Shippers. The Network Entry Agreement (NEA) at the SNSL sub-terminal between National Grid Gas Plc (NGG) and SNSL includes an upper limit on the gas Carbon Dioxide (CO_2) level of 4.0 mol% (molar percentage) for the gas delivered from the SAGE Sub-Terminal Entry Point into the National Transmission System (NTS). A number of Shippers at the SNSL sub-terminal have historically produced gas with CO_2 content in excess of the NEA limit requiring continuous CO_2 removal treatment via two aime absorption-based treatment trains. Current flow rates through the SNSL sub-terminal have reduced, with the CO_2 content typically averaging 3.0 mol% and is forecast to continue to decline towards 2.0 mol% by the end of the 2026/27 Gas Year. As such, SNSL consider CO_2 removal treatment is no longer required; one treatment train was retired from service approximately 6 years ago, the other is on standby for intermittent use during unplanned platform shutdowns[3].

SNSL now plans to mothball the remaining treatment train as part of an overall terminal rationalisation project which will reduce the sub-terminal costs and remove CO_2 emissions associated with running the remaining treatment train. However, during Shipper unplanned

[1] References to the "Authority", "Ofgem", "we" and "our" are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work. This decision is made by or on behalf of GEMA.
[2] This document is notice of the reasons for this decision as required by section 38A of the Gas Act 1986.
[3] Unplanned platform outages can result in flow disturbances and short duration composition spikes on the pipeline which may require short term CO_2 removal to maintain the sales gas within the 4.0 mol% CO_2 specification.

shutdowns, there can be reduced gas flows through the SNSL sub-terminal potentially increasing the CO_2 content of the gas leaving the sub-terminal to circa. 6.0 mol%, and in breach of the NEA CO_2 limit.

The modification proposal

UNC780 is an enabling modification, raised by SNSL (the Proposer). The modification seeks to facilitate a temporary increase in the CO_2 limit within the NEA at the SNSL sub-terminal at St. Fergus between NGG and SNSL from 4.0 mol% to 6.0 mol% subject to a cap on total inerts (CO_2 and N_2) at 7.0 mol% until the end of Gas Year 2026/27[4].
National Grid NTS would be permitted to reduce the CO_2 limit at the St Fergus SNSL sub-terminal System Entry Point to a level between 4.0 mol% and 6.0 mol% with a 2 year notice period if either:

(a) another UNC Modification(s) is raised that seeks to increase the CO_2 limit at another NTS System Entry Point that National Grid NTS would be unable to accommodate without incurring material cost; and/or

(b) if in the reasonable opinion of National Grid NTS, the 6.0mol% CO_2 limit has had a material adverse impact on the operation of any NTS compressor and/or the determination of emissions from an NTS compressor.

It is proposed that the modification would be subject to an annual demonstration of a continued requirement, whereby SNSL would submit a review to National Grid NTS each year within the time period for which this modification applies, showing the actual usage of the specification relaxation, and demonstrating the continued credible threat of high CO_2 pipeline upset situations. Further, SNSL would be required to use their reasonable endeavours to notify National Grid NTS if it expects an increase in CO_2 beyond 4 mol% to occur in the gas it delivers at St Fergus.

[4] Changes to the flows of gas through the SNSL sub-terminal mean that beyond the end of Gas Year 2026/27, CO_2 spikes will not be expected to occur, and so the increased CO_2 limit is no longer required.

UNC Panel[5] recommendation

At the UNC Panel meeting on 17 February 2022, the UNC Panel considered that UNC780 should not be implemented under self-governance, and should proceed to Authority Decision instead. We understand that this was due to Panel members deeming that the potential shifting of CO_2 emissions (and potential associated costs) between affected parties could be considered to be an impact on existing or future consumers.

UNC Panel members considered that UNC780 would better facilitate UNC Relevant Objectives (a) and (d); however, a majority of the Panel did not recommend its approval.

Our decision

We have considered the issues raised by the modification proposal and the Final Modification Report (FMR) dated 17 February 2022. We have considered and taken into account the responses to the industry consultation on the modification proposal which are attached to the FMR[6]. We have concluded that:

- implementation of the modification proposal will better facilitate the achievement of the relevant objectives of the UNC;[7] and
- directing that the modification be made is consistent with our principal objective and statutory duties.[8]

Reasons for our decision

Through discussion with the UNC Code Administrator, we understand that Panel members who did not vote to recommend implementation had concerns primarily regarding the passing of CO_2 emissions to end users. We acknowledge that high CO_2 gas flows into the NTS will result in marginally higher end user emissions, however we do not consider that this will have

[5] The UNC Panel is established and constituted from time to time pursuant to and in accordance with the UNC Modification Rules.
[6] UNC modification proposals, modification reports and representations can be viewed on the Joint Office of Gas Transporters website at www.gasgovernance.co.uk
[7] As set out in Standard Special Condition A11(1) of the Gas Transporters Licence, available at: https://epr.ofgem.gov.uk//Content/Documents/Standard%20Special%20Condition%20-%20PART%20A%20Consolidated%20-%20Current%20Version.pdf
[8] The Authority's statutory duties are wider than matters which the Panel must take into consideration and are detailed mainly in the Gas Act 1986 as amended.

monetary consequences on end users. The FMR includes a greenhouse gas emissions impact assessment carried out by the Proposer, which indicates that the continued operation of the CO_2 treatment train would result in circa. 27k tonnes of CO_2 emissions per year, whilst only removing circa. 3k tonnes of CO_2 per year. The blended gas arriving at the SNSL sub-terminal no longer requires continuous CO_2 removal using a treatment train. At present, the CO_2 content arriving at the SNSL sub-terminal is on average circa. 3.0 mol% and this is predicted to continue declining towards 2.0 mol% by the end of the 2026/2027 Gas Year. As a result, the CO_2 emitted directly as a result of fuel gas consumption or indirectly as a result of electricity consumption from the ongoing operation and maintenance cost of the treatment train is far greater than the CO_2 that is removed. We therefore consider that UNC780 facilitates a reduction in overall net CO_2 emissions.

Analysis carried out by both SNSL and National Grid NTS found that, due to unplanned platform outages, gas entering the St. Fergus terminal from the SNSL sub-terminal is likely to have CO_2 content in excess of 4 mol% (up to 6.0 mol%) for up to circa. 48 hours approximately five times a year. However, due to comingling with gas flowing from the other two sub-terminals at St. Fergus (the North Sea Midstream Partners (NSMP) sub-terminal[9], and the SHELL sub-terminal), this would not result in the gas entering the NTS at St. Fergus having CO_2 content in excess of 4 mol% under most scenarios. The two exceptions to this are coincident high CO_2 content gas entering the NTS from both the SNSL and NSMP sub-terminals (estimated to be a 1 in 5 to 10 year event), and high CO_2 content gas from the SNSL sub-terminal coincident with the inadvertent shut-in of either, or both, of the NSMP or SHELL sub-terminals (estimated to be a 1 in 1000 year event). The FMR states that under both scenarios there are actions that may be taken by Shippers or National Grid to keep CO_2 content to below 4.0 mol%. We therefore consider that the likelihood of gas with CO_2 content in excess of 4 mol% entering the NTS as a result of this modification proposal is low.

National Grid NTS also assessed the potential impact of gas with high CO_2 content entering the NTS at St. Fergus, and considered there to be little impact on the operability of NTS compressors further downstream, provided that there is sufficient flow and CO_2 content of gas

[9] We note that on 27 February 2018, we approved UNC modification UNC607. This allowed the CO_2 limit within the NEA at NSMP sub terminal at St. Fergus between NGG plc and NSMP Ltd. To be increased from 4 mol% to 5.5 mol% until the end of the Gas Year 2023/24. Our decision can be found on our website; https://www.ofgem.gov.uk/publications/unc607-amendment-gas-quality-nts-entry-specification-st-fergus-nsmp-system-entry-point

flowing from the NSMP or SHELL sub-terminals for comingling. They noted that instances of temporarily high CO_2 gas could impact the accuracy of predictive models used to determine compressor emissions. However, the Proposer has agreed that should UNC780 be implemented, they will endeavour to notify National Grid NTS in advance of an expected high CO_2 event in order to allow emissions to be monitored. Further, Ancala Midstream Acquisitions Limited, the SNSL sub-terminal operator, have confirmed to Ofgem that they are progressing solutions with to mitigate the impact of high CO_2 gas on the NTS. They have also confirmed that their pipeline modelling can alert the SAGE control room of potential high CO_2 spikes in advance of their occurrence, and that they will notify National Grid central control and the St Fergus terminal control room upon receipt of such an alert.

The proposal also allows for National Grid NTS to reduce the CO_2 limit at the St Fergus SNSL sub-terminal System Entry Point to a level between 4.0 mol% and 6.0 mol% with a 2 year notice period should a material impact arise as a result of the proposed changes. We consider these actions and controls are sufficient to mitigate the NTS compressor risks highlighted.

We note that similar UNC modification UNC607 proposing to increase the CO_2 limit from 4.0 mol% to 5.5 mol% subject to a cap on aggregate CO_2 and Nitrogen (N_2) at 7.0 mol% was recommended for approval by the UNC Panel and approved by Ofgem on 27 February 2018. As in UNC780, UNC607 risked high CO_2 gas entering the NTS for limited periods, and a carbon cost assessment indicated that installing CO_2 removal equipment would not be cost effective and result in higher overall net emissions. UNC607 also included provisions to allow National Grid NTS to reverse the increased CO_2 limit that the modification facilitated in the event that another UNC modification(s) to increase the CO2 limit is approved and National Grid NTS is unable to accommodate it without incurring material cost.

We consider this modification proposal will better facilitate UNC Relevant Objectives (a) and (d), and has a neutral impact on the other UNC Relevant Objectives.

(a) the efficient and economic operation of the pipe-line system to which this licence relates

The UNC Panel members considered that implementation of UNC780 would have a positive impact on the efficient and economic operation of the pipe-line system because the continued availability of a diverse range of gas through the SAGE sub-terminal may have the

consequential effect that the operational life of NTS assets is prolonged thereby yielding a benefit. Whilst we consider the efficient and economic operational benefits of UNC780 lie primarily with the SNSL sub-terminal, which is not a part of the pipe-line system as referred to in Objective (a), we agree with the UNC Panel view that the proposed modification may have the consequential effect of better facilitating this Objective.

As discussed above, there is a risk that the modification proposal could result in instances of gas with CO2 content above 4.0 mol% entering the NTS, which may have a negative impact on Objective (a). However, the likelihood of such events occurring is low, and measures are in place and being pursued to mitigate the impact of high CO_2 gas on NTS compressors.

On balance, we consider the modification proposal will better facilitate this UNC Relevant Objective (a).

(d) so far as is consistent with sub-paragraphs (a) to (c) the securing of effective competition:
(i) between relevant shippers;

We agree with Panel Members that the modification proposal facilitates the extension of the economic life of the SNSL sub-terminal, which in turn will promote competition between Shippers. We note a comment from a Workgroup Participant that the proposal could act to diminish competition between gas terminals, as other upstream operators may continue to incur gas treatment costs. However, the CO_2 limits specified within NEA's are bilaterally agreed with NGG, and so variations on CO_2 limits already exist and are considered on their individual merits. We further note that the proposal allows for National Grid NTS to reduce the CO_2 limit at the St Fergus SNSL sub-terminal, with a 2 year notice period, should another UNC modification be raised seeking to increase the CO_2 limit at another NTS System Entry Point that National Grid would be unable to economically accommodate.

We therefore consider the modification proposal will better facilitate this UNC Relevant Objective (d).

Decision notice

In accordance with Standard Special Condition A11 of the Gas Transporters licence, the Authority hereby directs that modification proposal UNC0780: 'Amendment to Gas Quality NTS Entry Specification at the St Fergus SAGE System Entry Point' be made.

Martin Queen
Principal Engineer – Analysis and Assurance
Signed on behalf of the Authority and authorised for that purpose