





<p>UNC Modification</p>	<p>At what stage is this document in the process?</p>
<p>UNC 0808: Reverse Compression</p>	<div style="display: flex; flex-direction: column; gap: 10px;"> <div style="border: 1px solid green; background-color: #008000; color: white; padding: 5px; display: flex; align-items: center; justify-content: center;"> 01 Modification </div> <div style="border: 1px solid blue; padding: 5px; display: flex; align-items: center; justify-content: center;"> 02 Workgroup Report </div> <div style="border: 1px solid purple; padding: 5px; display: flex; align-items: center; justify-content: center;"> 03 Draft Modification Report </div> <div style="border: 1px solid orange; padding: 5px; display: flex; align-items: center; justify-content: center;"> 04 Final Modification Report </div> </div>
<p>Purpose of Modification:</p> <p>To modify the UNC to enable a Distribution Network Operator (DNO) and an Independent Gas Transporter (IGT) to enter into a bilateral ‘operator to operator’ agreement, enabled by the iGT Arrangements Document (IGTAD) and containing Network Entry Provisions, to allow physical gas to be offtaken from a DNO by an IGT, compressed to a higher pressure, then returned to the same DNO by the IGT, through a process known as reverse compression.</p> <p>Reverse compression has zero net impact on physical flow into or out of the Total System, other than the initial filling (commissioning) of the IGT System, which is already established in IGTAD and the DNO’s associated CSEP Connection Arrangements. Neither reverse compression nor commissioning require User involvement.</p>	
<p>Next Steps:</p> <p>The Proposer recommends that this Modification should be:</p> <ul style="list-style-type: none"> • considered a material change and not subject to Self-Governance • assessed by a Workgroup. <p>This Modification will be presented by the Proposer to the Panel on 15 June 2023. The Panel will consider the Proposer’s recommendation and determine the appropriate route.</p>	
<p>Impacted Parties:</p> <p>High: Some Distributed Gas Producers, Compression service developers.</p> <p>Low: Distribution Network Operators (DNOs) and IGTs</p> <p>None: Gas Shippers and Suppliers, CDSP and Consumers</p>	
<p>Impacted Codes:</p> <p>UNC IGTAD</p> <p>UNC TPD Section I</p> <p>Possibly - UNC TPD Sections A and Y</p> <p>Possibly - iGT-UNC</p>	

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Timetable			Systems Provider: Xoserve
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Pre-Modification Discussed	28 April 2022		Other: Nick King, CNG Services nick.king@cngservices.co.uk
Date Modification Raised	09 May 2022		Other: John Baldwin, CNG Services john.baldwin@cngservices.co.uk
New Modification to be considered by Panel	19 May 2022		
First Workgroup Meeting	26 May 2022		
Workgroup Report to be presented to Panel	15 June 2023		
Draft Modification Report issued for consultation	16 June 2023		
Consultation Close-out for representations	07 July 2023		
Final Modification Report available for Panel	12 July 2023		
Modification Panel decision	20 July 2023		

1 Summary

What

The Code is silent on embedded “Reverse Compression”. This Modification was initially proposed to allow private sector investment in reverse compression to be treated in the same way as network investment, for example with no entry or exit charges applicable. Legal advice is that a Gas Transporter (GT) licence would be required for any pipeline system that supports reverse compression. This Modification now seeks to introduce the requirements that would apply in cases where gas can flow from an IGT to a DNO.

Why

Compressors can be used to move gas from a lower to higher pressure tier pipeline. This can relieve capacity constraints for distributed entry. This can only be effective if the relevant DNO supports the process and manages its network to accommodate the changed flows. Embedded pipeline reinforcement and smart pressure control are also able to provide additional entry capacity. Compressors can be used when these options cannot deliver all the necessary capacity. It is proposed that this and any specific requirements the DNO has of the IGT be captured in a bilateral ‘operator to operator’ agreement. This UNC Modification is proposed to require the IGT and DNO to enter into such an agreement.

How

UNC amendment to recognise that gas can flow from an IGT to a DNO and, when proposed, require an IGT and a DNO to enter into a bilateral ‘operator to operator’ agreement in order to support this.

2 Governance

Justification for Authority Direction

Reverse compression will only be successful if supported by the relevant DNO and so cooperation is essential. This is an enabling Modification that would require development of the operating parameters, but the actual operation would not be impacted. This is a clarifying and enabling Modification, however implementation may have a material impact on a party, so Authority Direction is appropriate.

Requested Next Steps

This Modification should:

- be subject to Authority Direction as it may be considered a non-material change.
- be assessed by a Workgroup.

3 Why Change?

The injection of distributed gas is growing. As at the end of March 2022, 126 DN entry points were registered on Gemini.

Barrow Green Gas (BGG) understands that around 15 existing biomethane projects flare gas from time to time because of DNO capacity constraints. BGG has seen an estimate that suggests around half of the currently identified potential new biomethane sites face local grid capacity constraints and, as a result, are unlikely to be developed. This may be exacerbated by high gas prices that can be expected to reduce gas demand, with a

consequence being additional flaring of biomethane due to the capacity reduction (biomethane plants cannot be instantaneously turned off and the ability to flare gas is a safety measure to ensure pressure can be relieved).

Constraints typically arise in the summer months when demand is low. However, it is possible to export gas from one pipeline pressure tier (e.g. Medium Pressure) to a higher one (e.g. Intermediate Pressure). This increases the ability of a DNO to accept gas, with higher pressure tiers able to more easily accommodate additional gas as it provides access to more widespread sources of demand.

The ability of Reverse Compression to increase the capacity available to accommodate distributed gas is established in Europe, for example with over 30 projects in France. Cadent are completing the first such project in GB at a site near Doncaster, funded by Ofgem NIC. All the DNOs are proposing to offer reverse compression within their networks as an option, with discussions underway in an entry connections forum. Distributed gas producers, however, are interested in arranging this for themselves, and a number of such projects are being actively pursued.

This Modification was initially brought forward to ensure a level playing field such that private sector investment in reverse compression could compete with DNO investment. However, legal advice from the DNOs is that any pipeline installed to deliver reverse compression would have to be subject to a GT licence. The UNC is silent on the concept of an IGT that supports gas being injected to as well as receiving it from a DNO, and does not envisage reverse compression via an IGT system. This Modification is, therefore, proposed to address this and provide clarity about the requirements when gas originally taken from a DNO can flow back from the IGT to the DNO.

4 Code Specific Matters

Reference Documents

UNC IGTAD

UNC TPD Section A, I, J and Y

iGT-UNC

Knowledge/Skills

Understanding of connected system rules and distributed gas entry requirements.

5 Solution

Setting the scene: UNC 'Total System' boundary definitions

The UNC has generic terms for physical connection facility interfaces between UNC signatory gas transporters and non-UNC signatory operators at the boundaries of the 'Total System':

- 'System Exit Point'
- 'System Entry Point'

The UNC is based upon the operators of these facilities having non-UNC bilateral 'operator to operator' agreements, but requires that such agreements contain specified binding operational provisions/parameters which are referenced and used by UNC gas transportation provisions relating to gas leaving and entering the Total System.

The provisions are respectively:

- 'Network Exit Provisions', enabled by TPD Section J. For non-UNC parties, they are held in a bilateral 'operator to operator' agreement, such as a Network Exit Agreement, which is otherwise operational and does not contain any commercial gas transportation rules. For IGTs, these provisions are contained within UNC IGTAD, which they are party to.
- 'Network Entry Provisions', enabled by TPD Section I. For non-UNC parties, they are held in a bilateral 'operator to operator' agreement, termed a 'Network Entry Agreement' for UNC purposes, which is otherwise operational and does not contain any commercial gas transportation rules. At the time of creation of IGTAD, it was not anticipated that entry would be required, so there are no entry provisions within it and it cannot be considered a Network Entry Agreement.

For an IGT System to provide reverse compression, it requires exit and entry interfaces with the DNO System.

The arrangements for exit are already established for IGT Systems through the IGTAD, and include provisions for the initial filling of the IGT System with gas (commissioning) without the involvement of Users.

Arrangements for entry exist for non-IGTs, but no variant appropriate for IGT System reverse flow exists. This modification proposal aims to introduce such arrangements through additions and amendments to IGTAD and where required to make this work, minor changes to TPD sections including A and I.

As the modification is based on there being no new gas entry to the IGT System (and therefore the DNO network, being a part of the Total System) and the arrangements being exclusively operational, no changes to iGT-UNC are anticipated, however development of the business rules may change that.

For the avoidance of doubt, whilst outside the scope of this modification, it is recognised that having the principle of an entry point for reverse compression physical flows in IGTAD could facilitate a future modification proposal to add 'new IGT gas entry' provisions to IGTAD by creating 'entry' equivalents of the CSEP Supply Point/IGTS Supply Point principles already in use in TPD and IGTAD, subject to a further UNC modification and corresponding changes in iGT-UNC being agreed.

For the avoidance of doubt, IGTAD A 1.2.3 *"Nothing in this Document provides for the supply of any service between any DN Operator and an Independent Gas Transporter or creates any payment obligation as between a DN Operator and an Independent Gas Transporter"* would remain unchanged, likewise A 1.4.1 (a) under which IGT licensees are required to notify each DN Operator should a connection be envisaged through which an IGT System would be connected to more than one DNO System, or to a DNO System in more than one Exit Zone.

Proposed Business Rules

- 1) The existing defined term CSEP can remain unchanged; likewise the physical flow and gas transportation principles associated with an 'Unmetered CSEP'.
- 2) A new defined term for 'entry' is to be introduced in TPD Section A, TPD Section I and/or IGTAD Section A, to recognise the IGT System as both a 'Connected Offtake System' (for TPD J) and a 'Connected Delivery Facility' (for TPD I). TPD I 1.2.4 already allows a single physical connection to be both a 'Connected Offtake System' and a 'Connected Delivery Facility'.
- 3) The term should be an entry equivalent of the existing qualifier term 'Unmetered' in TPD J 3.3.4, which differentiates two sub-classes of Connected System Exit Point as follows: *"A Connected System Exit Point is an **"Unmetered"** Connected System Exit Point where at any Individual System Exit Point comprised in the Connected System Exit Point there is no meter for the purpose of measuring the volume of gas offtaken from the Total System, and otherwise is a **"Metered"** Connected System Exit Point."*. This has a useful default whereby any use of the term 'CSEP' that does not have a prefix qualifier is 'Metered', avoiding the need for the qualifier to be used throughout the UNC.

- 4) The new term is to be achieved by applying a prefix of 'IGT' to the existing TPD Section I 3.11.1 term 'LDZ System Entry Point', thereby creating 'IGT LDZ System Entry Point'.
- 5) The definition of an IGT LDZ System Entry Point shall only apply where:
 - a. The operator of the Connected Delivery System is a:
 - i. holder of a Gas Transporter Licence; and
 - ii. a party to IGTAD
 - b. The Connected Delivery System to be connected at the IGT LDZ System Entry Point is a reverse compression facility (comprising pipeline(s), compression plant and/or other installations)
 - c. The Connected Delivery System to be connected at the IGT LDZ System Entry Point shall not incorporate any infrastructure that enables:
 - i. new non-Total System gas to enter the IGT System; or
 - ii. the offtake of gas from the IGT System to premises
- 6) This new entry definition 'IGT LDZ System Entry Point' and associated mechanism shall not be a relevant point for the purposes of commercial gas transportation including capacity, metered flows for daily balancing etc.
- 7) Any generic entry provisions applicable to all relevant IGT Systems shall be incorporated in IGTAD, and that site specific content shall be held in the 'Network Entry Provisions' section of a bilateral 'operator to operator' agreement outside UNC that shall otherwise be operational and not contain any commercial gas transportation rules.
- 8) It is proposed that an Independent Gas Transporter and a DN Operator will not permit gas to flow into a DNO System at an IGT LDZ System Entry Point as a result of reverse compression (i.e. through the use of facilities the operation of which by the Independent Gas Transporter causes gas to flow back from the IGT System to the DNO System to which it is connected at an IGT LDZ System Entry Point) unless there is in force an IGT LDZ System Network Entry Agreement.
- 9) If the changes within these business rules apply, then the existing defined term 'IGT System' shall include reverse compression.
- 10) The IGTAD Section C mechanism for shrinkage shall continue to apply unchanged.
- 11) IGTAD A 3.2.2 (and through B 1.2.3 (e), delegation of detail to 'CSEP Connection Arrangements') and B 2.1.1 has the mechanism for the introduction of non-User gas for the purpose of commissioning of an IGT, but otherwise has all physical gas leaving the DNO System being transferred to Users. Change is required to this and/or A 3.2.1 and A 3.2.3 to allow gas moved within the IGT System from DNO exit to DNO entry for the purposes of reverse compression to be ignored for commercial gas transportation purposes. Post commissioning, which would involve a small quantity of gas on one day, LDZ Daily Quantity Offtaken would be unchanged, there being no net increase or decrease in the Total System gas volume as a consequence of reverse compression.

Additional information to support the Business Rules

- 1) Whilst outside UNC, it is anticipated that the Connection Charging Methodology Statements and the associated terms and conditions of connection for the 'IGT LDZ System Entry Point' would have provisions similar to those in existing LDZ System Entry Point documents, but with minimal monitoring equipment required, based on the gas entering the Total System being the same gas that left the Total System, with little potential for change except perhaps rare and exceptional small scale and short duration instances of oil contamination.

- a. Requirements for design assessments, HAZOPs and GL/5 compliance would be anticipated to apply and the DNOs would have further comfort as the IGT System would be subject to the Gas Safety (Management) Regulations (GS(M)R) including the obligation on the IGT to have a Safety Case, which includes arrangements for 'operator to operator' communication and interaction, and also the Pipelines Safety Regulations (PSR).
 - b. The details of the initial requirement for the IGT to include any non-fiscal measurement device in the design and construction, for 'operational phase' system operation purposes, and telemetry interface to be constructed for later use under the bilateral 'operator to operator' agreement would be contained here.
- 2) The design of the exact form of the bilateral 'operator to operator' agreement would be for the DNO as it is outside UNC, other than it having to meet the requirement for such agreement to be a 'Network Entry Agreement' for UNC purposes, i.e. by containing Network Entry Provisions site specific detail.
- a. As with existing NExAs for large Supply Meter Points and NEAs, the provisions for ongoing operation of the telemetry interface to be constructed under (a) above would be contained here.
 - b. Likewise provisions for any non-fiscal measurement device for system operation purposes, however such arrangements must not be considered as within the UNC term 'Measurement Provisions' as this triggers gas transportation provisions in TPD sections.
 - c. The 'operator to operator' bilateral agreement 'Local Operating Procedures' section as used in 'Network Entry Agreements' would seem to be the place to cover matters such as:
 - i. enduring operational communications between IGT and DNO concerning the day-to-day operation of the reverse compression asset
 - ii. updates on expected exit and entry flow rates from and to the network.

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

Reduced biomethane flaring is positive through environmental benefits. Increasing biomethane supply theoretically lowers consumer prices (higher supply and unchanged demand puts downward pressure on prices), but the limited scale means any impact would be minimal.

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

No Change.

Impact of the change on Consumer Benefit Areas:	
Area	Identified impact
Improved safety and reliability No change.	None
Lower bills than would otherwise be the case Theoretical benefit but too small to be realised in practice.	None
Reduced environmental damage Reducing biomethane flaring has clear environmental benefits. Reverse compression will also facilitate additional distributed entry that would otherwise not be developed due to DNO capacity constraints.	Positive
Improved quality of service No change	None
Benefits for society as a whole Small employment opportunities would be created through the development and installation of compressors.	Positive

Cross-Code Impacts

There may be an impact on the iGT-UNC.

EU Code Impacts

None

Central Systems Impacts

No Impact.

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.	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.	Positive

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

Ensuring that an operating agreement is in place between an IGT and DNO will facilitate economic and efficient system operation through clarity and certainty around how the connected systems will be operated.

By facilitating the development of IGT Connected Systems that deliver reverse compression, implementation would increase the likelihood of schemes being implemented that alleviate capacity constraints and allow increased volumes of distributed gas to be injected. This would facilitate:

Efficient and economic operation of the pipeline system through the existence of reverse compression that may not otherwise be installed, increasing the options available to a network operator.

Efficient discharge of the licensee's obligations by ensuring a level playing field between DNO and IGT compression schemes, avoiding any suggestion of undue discrimination.

Securing of effective competition between relevant Shippers and between relevant Suppliers by allowing injection of distributed gas that may otherwise be flared or not developed, with increased supply available to the market when it is economic to inject.

Impact of the Modification on the Transporters' Relevant Charging Methodology Objectives:

Relevant Objective	Identified impact
a) Save in so far as paragraphs (aa) or (d) apply, that compliance with the charging methodology results in charges which reflect the costs incurred by the licensee in its transportation business;	None
aa) That, in so far as prices in respect of transportation arrangements are established by auction, either: (i) no reserve price is applied, or (ii) that reserve price is set at a level - (I) best calculated to promote efficiency and avoid undue preference in the supply of transportation services; and (II) best calculated to promote competition between gas suppliers and between gas shippers;	None
b) That, so far as is consistent with sub-paragraph (a), the charging methodology properly takes account of developments in the transportation business;	None

c) That, so far as is consistent with sub-paragraphs (a) and (b), compliance with the charging methodology facilitates effective competition between gas shippers and between gas suppliers; and	Positive
d) That the charging methodology reflects any alternative arrangements put in place in accordance with a determination made by the Secretary of State under paragraph 2A(a) of Standard Special Condition A27 (Disposal of Assets).	None
e) 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

8 Implementation

No implementation costs are envisaged as a result of this Modification.

Implementation should be as soon as practicably possible following Authority Direction.

9 Legal Text

Text Commentary

To be provided by the relevant Transporter.

Text

To be provided by the relevant Transporter.

10 Recommendations

Proposer's Recommendation to Panel

Panel is asked to:

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