

UNIFIED CODE OF OPERATIONS

PART G TECHNICAL

SPECIFICATIONS: QUALITY AND PRESSURE
SYSTEM PLANNING
MEASUREMENT
MEASUREMENT EQUIPMENT VERIFICATION
MAINTENANCE
APPENDIX 1: QUALITY SPECIFICATION OF NATURAL GAS AT ENTRY POINTS
APPENDIX 2: QUALITY SPECIFICATION OF NATURAL GAS AT OFFTAKE
POINTS

VERSION 1.01

POST CONSULTATION DRAFT

18 FEBRUARY 2005

IMPORTANT NOTE

The Commission directed Bord Gáis Éireann to develop legal drafting of the Unified Code of Operations ("**UCOP**") to reflect the Business Rules published by the Commission on 23 July 2004 and the underlying principles of the GMOWG Business Models, and to publish the legal drafting so developed for consultation with industry.

The Consultation Legal Drafting in respect of Part G (*Technical*) was published on the 19 November 2004. The attached represents the legal drafting of Part G (*Technical*) of the UCOP re-drafted by Bord Gáis Éireann in accordance with the directions of the Commission, following consultation with industry participants including the Commission, Shippers and the Transporter.

Part G

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1. SPECIFICATIONS: QUALITY AND PRESSURE

1.1 Quality

1.1.1 Natural Gas delivered to, or tendered for delivery at, an Entry Point shall comply with the specification for Natural Gas entering the Transportation System ("**Entry Specification**") with respect to:

- (a) all existing Entry Points, consistent with the terms of the relevant CSA as notified to Shippers by the Transporter or if there is no such CSA or the CSA does not include or provide for a Natural Gas quality specification, then the specification shall be such specification as agreed between the Transporter and the Connected System Operator as notified by the Transporter to Shippers, or if there is no such agreed specification, the specification outlined in Appendix 1; and/or
- (b) any new Entry Point, consistent with the CSA entered into with respect to such new Entry Point, or if there is no such CSA or the CSA does not include or provide for a Natural Gas quality specification, then the specification shall be such specification as agreed between the Transporter and the Connected System Operator as notified to Shippers, or if there is no such agreed specification, the specification outlined in Appendix 1.

1.1.2 Natural Gas made available by the Transporter for offtake at an Offtake Point shall comply with the Offtake Specification for Natural Gas offtaken from the Transportation System outlined in Appendix 2 ("**Offtake Specification**").

1.1.3 Each Shipper shall use all reasonable endeavours to procure that the appropriate contractual arrangements are in place and to procure implementation of any quality control measures requested by the Transporter to ensure that the quality of all Natural Gas tendered for delivery by a Shipper to the Transportation System when delivered at the Entry Point accords to the Entry Specification as specified in Section 1.1.1.

1.2 Pressure

1.2.1 The Transporter shall make Natural Gas available for offtake from the Transmission System at an Exit Point at a minimum pressure ("**Transmission Minimum Pressure**") (as measured at the relevant Exit Point) of not less than:

- (a) eight (8) bar off the nineteen (19) bar system; and
- (b) nineteen (19) bar off the seventy (70) bar system.

1.2.2 The Transporter shall make Natural Gas available for offtake from the Distribution System at a pressure that is not less than the pressure required to ensure the safe operation of a Natural Gas Appliance.

- 1.2.3 The Transporter shall not be obliged to make Natural Gas available for offtake by a Shipper from the Transmission System at a pressure in excess of the Transmission Minimum Pressure. However, where a Shipper or End User requests Natural Gas to be made available for offtake at a pressure in excess of the Transmission Minimum Pressure then the Transporter may, if the Transporter agrees to provide such excess pressure, require the relevant Registered Shipper to enter into an agreement with the Transporter in respect of the provision of such excess pressure.
- 1.2.4 Where the pressure of Natural Gas immediately downstream of any LDM Exit Point or a TCDM Exit Point is in excess of the Transmission Minimum Pressure, the Transporter shall not be obliged to make Natural Gas available for offtake at such Offtake Point and any such failure to make such Natural Gas available shall not be considered a breach of this Code and/or any Ancillary Agreement.
- 1.2.5 Where the pressure of Natural Gas immediately downstream of any Supply Point is in excess of the prevailing pressure in the relevant part of the Distribution System, the Transporter shall not be obliged to make Natural Gas available for offtake at such Supply Point and any such failure to make such Natural Gas available shall not be considered a breach of this Code and/or any Ancillary Agreement.
- 1.2.6 The Transporter may make Natural Gas available for offtake at a LDM Exit Point or TCDM Exit Point at a pressure in excess of the Transmission Minimum Pressure and may make Natural Gas available for offtake from the Distribution System at a pressure in excess of the pressure referred to in Section 1.2.2.
- 1.2.7 Without prejudice to any other provisions of this Section 1, the availability of Natural Gas at any pressure shall be subject to the:
- (a) MHQ and Ramp Rate for any LDM Offtake not being exceeded;
 - (b) MHQ for any DM Offtake not being exceeded;
 - (c) relevant Shipper acting in accordance with the provisions of Part D (*Nominations, Allocations and NDM Supply Point Reconciliation*) Section 1 (*Nominations and Renominations*); and/or
 - (d) provisions of Part H (*Operations*) Sections 1 (*Emergencies*) and 2 (*Congestion Management*).
- 1.2.8 The Transporter shall be relieved of its obligations under this Section 1.2 if:
- (a) in order to maintain the Transmission Minimum Pressure, it is required to undertake works to the Transportation System or other system enhancement measures as a result of building, mining or engineering developments of third parties or changes in population density which

have occurred in the vicinity of the Transportation System, or any localised part thereof, and the works or other measures would be necessary in order to comply with the recommendations or standards recognised or promulgated pursuant to the Transportation Licences or by any independent standard making authority or professional engineering institution of Ireland and/or the United Kingdom concerning the maximum permissible operating pressure of Natural Gas pipelines; or

- (b) it is not or ceases or shall cease to be feasible or safe or in accordance with the applicable standard to maintain at any LDM Exit Point or TCDM Exit Point a pressure of at least the Transmission Minimum Pressure specified in Section 1.2, and the Transporter has, as soon as reasonably practicable after becoming aware that such Transmission Minimum Pressure cannot be maintained, informed the Shipper specifying the date with effect from which it shall be necessary to reduce such pressure and the reduced pressure which can (after such date) be so maintained.

1.2.9 With effect from the date specified by the Transporter pursuant to Section 1.2.8(b), the reduced pressure as specified by the Transporter shall be the revised Transmission Minimum Pressure.

1.2.10 The Transporter shall be relieved of its obligations to make Natural Gas available for offtake at a Supply Point if:

- (a) in order to maintain the pressure as referred to in Section 1.2.2 upstream of the Supply Point to facilitate the offtake of Natural Gas at such Supply Point, it is required to undertake works to the Transportation System or other system enhancement measures as a result of building, mining or engineering developments of third parties or changes in population density which have occurred in the vicinity of the Transportation System, or any localised part thereof, and the works or other measures would be necessary in order to comply with the recommendations or standards recognised or promulgated pursuant to the Transportation Licences or by any independent standard making authority or professional engineering institution of Ireland and/or the United Kingdom concerning the maximum permissible operating pressure of Natural Gas pipelines; or
- (b) it is not or ceases or shall cease to be feasible or safe or in accordance with the applicable standard to maintain the pressure upstream of any Supply Point to facilitate the offtake of Natural Gas at such Supply Point and the Transporter has, as soon as reasonably practicable after becoming aware that such pressure cannot be maintained, informed the Shipper specifying the date with effect from which it shall be necessary

to reduce such pressure and the reduced pressure which can (after such date) be so maintained.

- 1.2.11 Subject to Section 5 (*Maintenance*), the Transporter shall not knowingly schedule operations which it believes would result in the pressure of the Transmission System or any localised part thereof falling below the levels specified in Section 1.2.1 above or which would otherwise jeopardise the integrity of the Transmission System or any localised part thereof and the ability of the Transporter to provide transmission services.
- 1.2.12 The Transporter and each Shipper acknowledge that Natural Gas delivered at any Entry Point shall be at the delivery pressure prevailing at those points from time to time.

1.3 **Non-Compliant Gas**

- 1.3.1 Each Shipper shall use all reasonable endeavours (including ensuring that appropriate contractual arrangements are in place) to ensure that Natural Gas tendered for delivery at an Entry Point shall conform with the relevant Entry Specification. Without prejudice to the foregoing if Natural Gas delivered by a Shipper forms part of a commingled stream, and if the commingled stream fails to conform to the relevant Entry Specification, then whatever may be the reason for such failure, all Natural Gas tendered for delivery by the Shippers at the Entry Point shall be deemed to have failed to conform to the Entry Specification.
- 1.3.2 If Natural Gas tendered for delivery at the Entry Point fails to conform to the Entry Specification ("**Non-Compliant Gas**"), and the Transporter has been notified of such failure in advance of such Non-Compliant Gas being tendered for delivery, then the Transporter may:
 - (a) refuse to accept delivery or continued delivery of such Non-Compliant Gas or any part thereof;
 - (b) (subject to any Legal Requirement) accept delivery of all or part of such Non-Compliant Gas; and/or
 - (c) take any steps available to it to limit the rate at which such Non-Compliant Gas is delivered to the Transportation System or to secure that such Non-Compliant Gas is not so delivered or is treated in such a way as to enable it to comply with the Entry Specification.
- 1.3.3 Where Non-Compliant Gas is delivered by a Shipper to the Transportation System, irrespective of whether such Non-Compliant Gas is accepted pursuant to Section 1.3.2 (or where the Transporter becomes aware that such Natural Gas is Non-Compliant Gas after the delivery of such Natural Gas to the Entry Point), then in such event the Shipper(s) who delivered such Non-Compliant Gas shall, subject to the limitation of liabilities under Section 1.3.4, indemnify the Transporter for all costs and expenses properly incurred

by it as a consequence of the delivery of such Non-Compliant Gas, including costs and expenses incurred in taking whatever measures it considers are reasonably required:

- (a) in cleaning all or any part of the Transportation System or rectifying any other damage thereto caused by the delivery of such Non-Compliant Gas;
- (b) to ensure that the Transportation System can continue to be operated in accordance with the provisions of this Code notwithstanding the delivery or continued delivery of such Non-Compliant Gas; and/or
- (c) to bring such Natural Gas within the Entry Specification.

1.3.4 The costs and expenses incurred in accordance with Section 1.3.3 shall be recovered from each Shipper responsible, or deemed responsible, for such Non-Compliant Gas pro rata to their respective Final Entry Allocation(s) at the Entry Point on the Day, provided always that the Shipper's liability to the Transporter under Section 1.3.3 shall not, in respect of each delivery of Non-Compliant Gas, exceed ten (10) per cent of the amount determined by the Transporter as the Shipper's proportion of the total quantity of Non-Compliant Gas delivered to the Transportation System at the relevant Entry Point on the relevant Day multiplied by the First Tier Imbalance Price for that Day.

1.3.5 Each Shipper acknowledges, for the purposes of this Section 1.3, that the volume, quantity and Delivery Characteristics of Natural Gas delivered to the Transportation System at an Entry Point, and the compliance or non-compliance with the applicable Entry Specification in respect thereof, will be determined by the Transporter.

1.4 **Shippers' Natural Gas Deliveries**

1.4.1 Where on a Day more than one Registered Shipper delivers Natural Gas or tenders Natural Gas for delivery to the Transmission System at an Entry Point:

- (a) each such Registered Shipper shall be treated as delivering, or tendering for delivery, at such Entry Point, Natural Gas of the same Delivery Characteristics as that delivered, or tendered for delivery, at such Entry Point by each other Shipper; and
- (b) subject to Part H (*Operations*) Section 3.5 (*Administrative Procedures at an Entry Point*) the Natural Gas delivered, or tendered for delivery, at each Entry Point at any time on such Day shall, irrespective of differences in Delivery Characteristics at such Entry Point, be treated as delivered, or tendered for delivery, by each Registered Shipper in proportion to each Shipper's Nominated Quantity.

- 1.4.2 All Natural Gas delivered or tendered for delivery to the Transmission System at an Entry Point on a Day by, or on behalf of, a Registered Shipper shall be deemed to be delivered, or tendered for delivery (as the case may be) to the Transportation System, by such Registered Shipper irrespective of any act or omission of the Connected System Operator or any other person, including any Third Party Shipper or the Transporter.

1.5 **Off-Spec Gas**

- 1.5.1 If Natural Gas fails to conform to the Offtake Specification when made available for offtake by the Transporter at an Offtake Point ("**Off-Spec Gas**") then, until such time as the Transporter is able to make available for offtake Natural Gas in accordance with the Offtake Specification, the Shipper may, in its discretion, either:

- (a) offtake or continue to offtake such Off-Spec Gas; or
- (b) decline to offtake, or to continue to offtake, such Off-Spec Gas.

- 1.5.2 Where Off-Spec Gas has been offtaken on any Day from the Transmission System at an Exit Point, the Transporter shall only be liable to each Shipper for an amount determined in accordance with Section 1.5.3 save that if the Transporter shall have advised the Shipper that such Natural Gas was Off-Spec Gas prior to making the same available for offtake (such advice to be given to the Shippers by the Transporter as soon as is reasonably practicable following the Transporter becoming aware of the existence of Off-Spec Gas) the Transporter shall have no liability to the Shipper(s) as a consequence of the delivery of such Off-Spec Gas (whether or not such Off-Spec Gas was offtaken by the Shipper at such Exit Point) or in respect of the non-availability for offtake of Natural Gas (where the same was nonetheless available for offtake at such Exit Point notwithstanding the Transporter's expectation that Off-Spec Gas would be available) or otherwise howsoever arising including as a result of the advice given by the Transporter in this Section 1.5.2.

- 1.5.3 Subject to Section 1.5.2, the Transporter's only liability to a Shipper under this Code for Off-Spec Gas shall be the costs and expenses properly incurred by the Shipper as a direct consequence of the offtake of the Off-Spec Gas, including costs and expenses incurred in taking whatever measures are reasonably required to ensure that:

- (a) the Off-Spec Gas can be made fit for use in the relevant End User's Facility; and/or
- (b) (where applicable) in the case of a Connected System Exit Point, the Relevant Offtake Facility can be operated in accordance with applicable Legal Requirements, notwithstanding the offtake or continued offtake of such Off-Spec Gas,

provided that the Transporter shall not be liable for any damage or loss caused to or suffered by any property of, or used by, the Shipper (and the Shipper shall indemnify the Transporter with respect to any claim by an End User in connection with such damage or loss), and further provided always that the Transporter's liability to a Shipper hereunder shall not exceed ten (10) per cent of the amount calculated as the Shipper's proportion of the total quantity of Off-Spec Gas offtaken from the Transmission System at the relevant Exit Point on the relevant Day multiplied by the First Tier Imbalance Price for that Day and subject always to, and only up to the extent specified in, Part I (*Legal and General*) Section 2 (*Liabilities and Indemnities*).

- 1.5.4 Where a Shipper incurs costs and expenses in accordance with this Section 1.5, the Shipper shall as soon as reasonably practicable notify the Transporter specifying:
- (a) the relevant Exit Point and the Day or Days at, and on which, Off-Spec Gas was offtaken by the Shipper from the Transmission System;
 - (b) the total quantity of Off-Spec Gas offtaken by the Shipper at such Exit Point and reasonable details of the respect(s) in which the Off-Spec Gas did not comply with the Offtake Specification;
 - (c) reasonable details of the steps taken to make the Off-Spec Gas fit for use in an End User's Facility and the costs and expenses of this procedure;
 - (d) the identity of the Shipper(s); and
 - (e) in respect of Shippers to Multiple Shipper LDM Exit Points, the Shipper's offtake proportion of such Off-Spec Gas.
- 1.5.5 The Transporter shall not be liable to a Shipper for any damage or loss suffered as a result of the offtake of any Off-Spec Gas from the Distribution System. Each Shipper shall indemnify the Transporter for any action, cost, claim, damage or loss caused to or suffered by any End User as a result of the offtake of Off-Spec Gas from the Distribution System.
- 1.5.6 Failure to comply with the pressure requirements of Section 1.2.1 shall not render (or be deemed to render) Natural Gas as being Off-Spec Gas for the purposes of this Section 1.5 and the Transporter shall not be liable hereunder as a result thereof.
- 1.5.7 Each Shipper acknowledges that the compliance or non-compliance of Natural Gas, offtaken from the Transportation System at an Offtake Point, with the Offtake Specification in respect thereof will be determined by the Transporter.

2. SYSTEM PLANNING

2.1 Estimates

2.1.1 For planning purposes, each Shipper shall supply the Transporter with such bona fide estimates of its anticipated short, medium and long-term capacity requirements at each Entry Point and at each Exit Point and/or Supply Point at which it is a Registered Shipper as may be practically possible. The estimates shall not be binding on a Shipper nor shall they impose any obligations on that Shipper or the Transporter.

The Transporter shall produce each year a seven (7) year plan which shall be non-binding as regards the Transporter, with respect to the reinforcement and development of the Transmission System the form and substance of which shall be in accordance with any relevant instructions of the Commission, and subject further to any confidentiality restrictions, recognising always that such plan may have to be amended from time to time. If the Transporter is issued with a direction to prepare a long term development statement in accordance with Condition 11 of the Transmission Licence, the Transporter shall be relieved of its obligation to produce a seven (7) year plan in accordance with the provisions of this Section 2.1.1.

2.1.2 Not later than the first Day of June in any year, each Shipper shall notify the Transporter of the Shipper's bona fide estimate of its maximum energy requirements (expressed in kWh/Day) and its maximum Flow Rate requirements (expressed in kW) for the following seven (7) Gas Years at:

- (a) each Entry Point;
- (b) each Exit Point; and
- (c) each Gas Point within a Supply Point,

at which the Shipper is then a Registered Shipper for each Gas Year in such following seven (7) year period.

2.1.3 Not later than the first Day of June in any year, each Shipper shall notify the Transporter of the Shipper's bona fide estimate of its maximum energy requirements (expressed in kWh/Day) and its maximum Flow Rate requirements (expressed in kW) to be:

- (a) delivered at each Entry Point;
- (b) offtaken at each Exit Point; and
- (c) offtaken at each Gas Point within a Supply Point,

at which the Shipper is then a Registered Shipper, for each month of the immediately following Gas Year.

2.1.4 Not later than 31 August in any year, and, thereafter, thirty (30) Days before the first Day of each subsequent Quarter of a Gas Year, each Shipper shall notify the Transporter of the Shipper's bona fide estimate of its maximum energy requirements (expressed in kWh/Day) and of its maximum Flow Rate requirements (expressed in kW) to be:

- (a) delivered at each Entry Point;
- (b) offtaken at each Exit Point; and
- (c) offtaken at each Gas Point within a Supply Point,

at which the Shipper has reserved capacity, on each Day (expressed as a maximum daily quantity) during each such subsequent Quarter.

2.1.5 No later than 10:00 hours on Wednesday of each week during the Gas Year, each Registered Shipper shall notify the Transporter of the Shipper's bona fide estimate of its maximum energy requirements (expressed in kWh/Day) for each Day of the following week, commencing on 06:00 hours on the following Sunday for:

- (a) delivery at each Entry Point at which the Shipper is a Registered Shipper;
- (b) offtake at each LDM Offtake(s) at which the Shipper is a Registered Shipper setting out an hourly profile of the flow required; and
- (c) offtake (in aggregate) at the DM Offtake(s) at which the Shipper is the Registered Shipper.

2.2 **Additional Information**

2.2.1 Each Shipper shall use all reasonable endeavours to provide any additional information reasonably requested by the Transporter that would aid the Transporter in planning the future deliveries of Natural Gas to, or offtake of Natural Gas from, the Transportation System. The Transporter shall notify Shippers on an annual basis of the type of additional information it requires for the purposes of this Section 2.2.

2.2.2 For the purposes only of enabling the Transporter to fulfil any statutory or regulatory duty to furnish such information to any Competent Authority (including HM Customs and Excise as required by the Customs and Excise Management Act 1979 of the United Kingdom) each Shipper shall be required to provide the Transporter, in respect of and in advance of each Month, with details of its Third Party Shippers including its Third Party Shippers on each Day of such Month and such other details concerning such Third Party Shippers as the Transporter may be required by law or regulation to furnish to such Competent Authority. Such information shall be provided

no later than the fifteenth Day of the Month preceding such Month whenever practicable and shall subsequently be confirmed on each Day of the Month.

- 2.2.3 The fact that a Shipper has provided the Transporter with information in accordance with this Section 2 shall not relieve such Shipper from an obligation to provide the Transporter with the same information in accordance with any other provision of this Code and/or any Ancillary Agreement.

3. MEASUREMENT

3.1 General

- 3.1.1 The provisions of this Section 3 shall apply to all Entry Points and Offtake Points except where otherwise stated.
- 3.1.2 "**Measurement Provisions**" means the procedures, methods and standards by which:
- (a) Natural Gas delivered to or tendered for delivery at Entry Points is measured, sampled and analysed;
 - (b) Natural Gas offtaken at an Offtake Point is measured and, where relevant, sampled and analysed; and
 - (c) the standard volume and Calorific Value of such Natural Gas are measured or determined.
- 3.1.3 Measurement Provisions may include:
- (a) standards of accuracy and procedures for testing and calibration of Measurement Equipment;
 - (b) terms by which volume, quantity, or any Delivery Characteristic of Natural Gas delivered to, or tendered for delivery at, an Entry Point to the Transportation System may be estimated in the case of failure or defect of any Measurement Equipment, non-compliance with any of the Measurement Provisions of the Entry Point, or otherwise;
 - (c) terms upon which any difference or dispute between the Upstream Operator and the Transporter as to the volume, quantity or Delivery Characteristics of Natural Gas delivered or tendered for delivery and/or with respect to the offtake of Natural Gas from the Transportation System shall be resolved (which may include resolution by agreement between them); or
 - (d) terms by which volume, quantity or characteristics of Natural Gas offtaken from the Transportation System at an Offtake Point may be estimated or determined in the case of failure or defect of any Measurement Equipment (or part thereof) or non-compliance with any of the Measurement Provisions at an Offtake Point, or otherwise.
- 3.1.4 Each Shipper acknowledges that the volume, quantity and Delivery Characteristics of Natural Gas which it delivers to, or tenders for delivery at, an Entry Point (by Shippers in aggregate) to the Transportation System, and the compliance or non-compliance with the applicable Entry Point Requirements or Entry Specification in respect thereof, shall be established by the Transporter and the Upstream Operator (pursuant to the Entry Point Requirements set out in Part H (*Operations*) Section 3.1 (*Entry Point*

Requirements)) in accordance with the applicable Measurement Provisions at the Entry Point and by means of the Measurement Equipment, and each Shipper shall be bound (for the purposes of this Code) by what is so established.

- 3.1.5 The procedures, methods and standards referred to in Section 3.1.2 shall be interpreted in accordance with:
- (a) the Transporter's standards and policies;
 - (b) the relevant standards of CEN, NSAI and the ISO code; and/or
 - (c) applicable Legal Requirement(s) (if any).

3.2 **Measurement Equipment**

- 3.2.1 "**Measurement Equipment**" means that equipment installed, or required by the Transporter to be so installed, at an Entry Point or at an Offtake Point for the purpose of measuring the volume of Natural Gas delivered to or offtaken from the Transportation System (as the case may be) comprising the primary metering equipment for measuring the primary gas flow and, where applicable, Secondary Instrumentation .
- 3.2.2 The Transporter shall ensure, or shall procure, the installation of Measurement Equipment at each Entry Point.
- 3.2.3 The Transporter shall ensure, or shall procure, the installation of appropriate Measurement Equipment at each Offtake Point and shall operate and maintain and/or shall procure the operation and maintenance of Measurement Equipment at each Offtake Point.

3.3 **Entry Point Measurement**

The quantity of Natural Gas delivered to an Entry Point shall be the aggregate volume measured by the Measurement Equipment multiplied by the Calorific Value at such Entry Point and shall be allocated in accordance with Part D (*Nominations, Allocations and NDM Supply Point Reconciliation*) Section 2 (*Allocations*).

3.4 **LDM Offtake Measurement**

- 3.4.1 The quantity of Natural Gas offtaken by a Shipper at a LDM Offtake on a Day shall be the volume of Natural Gas metered or determined by the Transporter as having been offtaken at such LDM Offtake on such Day multiplied by the applicable Calorific Value of such Natural Gas and shall be allocated in accordance with Part D (*Nominations, Allocations and NDM Supply Point Reconciliation*) Section 2 (*Allocations*).
- 3.4.2 If requested by a Shipper, the Transporter shall provide the Shipper, subject to such Shipper reimbursing the Transporter for its reasonable costs in providing such information, with the following data from the LDM Offtake at which the

Shipper is offtaking Natural Gas, in respect of such offtaken Natural Gas, and as soon as the same is reasonably available:

- (a) Instantaneous Flow Rate;
- (b) cumulative volume;
- (c) Instantaneous Energy Rate;
- (d) cumulative energy; and
- (e) Calorific Value or, where relevant, applicable Calorific Value.

3.5 **Absence of Valid Reads at LDM Offtakes**

In the absence of a Valid Meter Read(s) from the Measurement Equipment at a LDM Offtake in respect of a Day, the Transporter may determine the quantity of Natural Gas flowing through such Measurement Equipment by either:

- (a) using appropriate Natural Gas engineering technology; or
- (b) estimating such quantities by flowing Natural Gas through the same Measurement Equipment under similar conditions.

3.6 **DM Offtake Measurement**

The quantity of Natural Gas offtaken by a Shipper at a DM Offtake on a Day shall be the volume of Natural Gas metered or determined by the Transporter as having been offtaken at such DM Offtake on such Day multiplied by the applicable Calorific Value of such Natural Gas.

3.7 **Absence of Valid Meter Reads at DM Offtakes**

3.7.1 If a Valid Meter Read is unavailable at a DM Offtake in respect of a Day, a quantity of Natural Gas shall be allocated in accordance with Part D (*Nominations, Allocations and NDM Supply Point Reconciliation*) Section 2 (*Allocations*).

3.7.2 If a Valid Meter Read from a DM Offtake is unavailable for more than five (5) consecutive Days, the Transporter shall reasonably determine the most appropriate solution and inform the Shipper within two (2) Days.

3.8 **NDM Supply Point Measurement**

The quantity of Natural Gas offtaken at a NDM Supply Point in respect of a period shall be the volume of Natural Gas metered or determined by the Transporter (in accordance with Part F (*Administration*) Section 5 (*Meter Data Services*) and the Meter Data Services Procedures) as having been offtaken at such NDM Supply Point during such period multiplied by the applicable Calorific Value.

3.9 **Meter Data Cleansing**

- 3.9.1 The Transporter may, following the end of each Month and prior to the issue of a Monthly Invoice(s) which includes an Invoice Item(s) calculated by reference to meter data (or, in the absence of relevant meter data, pursuant to Sections 3.4, 3.5, 3.6 or 3.7), review such meter data and undertake a meter data cleansing process. Following such meter data cleansing process, Monthly Invoice(s) may include an Invoice Item with respect to the adjustment of the commodity component of the applicable Tariff(s) payable by Shippers to reflect the outcome of such meter data cleansing process.
- 3.9.2 For the avoidance of doubt, an adjustment of the commodity component of the Tariff to reflect any adjustment to the quantity of Natural Gas oftaken from the Transportation System as a result of the meter data cleansing process shall not affect Shippers' Final Allocations. The Transporter shall, when undertaking reconciliation in accordance with the Reconciliation Procedures, take account of any such adjustment.

3.10 **Interpretation of Standards**

The Transporter shall be responsible for the interpretation of standards, guidelines and specifications used in the design, installation, operation and maintenance of the Measurement Equipment.

4. MEASUREMENT EQUIPMENT VERIFICATION

4.1 General

This Section 4 includes the standards of accuracy and the procedures for the testing and calibration of Measurement Equipment and the terms upon which any difference or dispute between the Transporter and a Shipper as to volume, Calorific Value or quantity of Natural Gas delivered is resolved.

4.2 Measurement Equipment Uncertainty

4.2.1 The uncertainty in the Measurement Equipment shall in all steady-state flow conditions not exceed:

- (a) with respect to an Entry Point, that uncertainty specified in the relevant CSA, and if the uncertainty is not specified in the CSA, +/- 1 per cent (volume) and +/- 1.1 per cent (energy) over the range of 20 - 100 per cent of the Maximum Flow Rate for such Entry Point;
- (b) with respect to a LDM Offtake, +/- 1 per cent (volume) and +/-1.1 per cent (energy) over the range of 20 - 100 per cent of the Maximum Flow Rate for such offtakes;
- (c) with respect to a DM Offtake, +/- 1 per cent (volume) and +/- 1.1 per cent (energy) over the range of 20 - 100 per cent of the Maximum Flow Rate such offtakes; and
- (d) with respect to a NDM Supply Point, +/- 3 per cent (volume) over the range of 20 - 100 per cent of the Maximum Flow Rate for NDM Supply Points,

(each of (a), (b), (c) and (d) being the "**Permitted Range**" and together, the "**Permitted Ranges**").

4.2.2 The levels of uncertainty specified in Section 4.2.1 shall be calculated:

- (a) with respect to Entry Points or LDM Offtakes, using the method specified in ISO 5167/5168 for orifice plate meters, BS 7965:2000 for ultrasonic meters and/or EN 12261 for turbine meters (as appropriate); and/or
- (b) with respect to DM Offtakes, using the method specified in EN 12261 for turbine meters and/or EN 12480 for rotary displacement meters (as appropriate); and/or
- (c) with respect to NDM Supply Points, using the method specified in EN 12261 for turbine meters, EN 12480 for rotary displacement meters and/or EN 1359 for diaphragm meters (as appropriate),

for the determination of uncertainties of the measurement of those volume flow rates that are used to compute flow rates.

4.3 Secondary Instrumentation Uncertainty

The uncertainty of Secondary Instrumentation shall not exceed the level of uncertainty published by the Transporter from time to time.

4.4 Shipper Access to Measurement Equipment

A Shipper shall have a right of access, on giving reasonable notice to the Transporter, to the Measurement Equipment at an Offtake Point at which such Shipper is offtaking Natural Gas and is the Registered Shipper provided that such Shipper utilises such access rights at reasonable times and at such Shipper's own risk.

4.5 Verification of Entry Point Measurement Equipment

4.5.1 Following a verification in accordance with this Section 4, if the Measurement Equipment at an Entry Point is found to register outside the Permitted Range, the Measurement Equipment shall be assumed to have registered outside the Permitted Range during the latter half of the period since the date on which the Measurement Equipment was last verified and found to produce readings within the Permitted Range except where there is satisfactory evidence which indicates that the Measurement Equipment commenced to register outside the Permitted Range on some other date.

4.5.2 At:

- (a) the Moffat Entry Point, the Moffat Measurement Equipment is operated and maintained by Transco. The Transporter shall procure that Transco carries out verification of the Measurement Equipment at the Moffat Entry Point in accordance with the Moffat CSA. The Beattock Measurement Equipment at the Moffat Entry Point is operated and maintained by the Transporter. The Transporter shall carry out verification of the Beattock Measurement Equipment in accordance with the Moffat CSA;
- (b) the Inch Entry Point, the Measurement Equipment is operated and maintained by the Inch Operator. The Transporter shall verify, or shall procure that the Inch Operator carries out verification of, the Measurement Equipment at the Inch Entry Point; and
- (c) any new Entry Point, the Measurement Equipment shall be operated and maintained in accordance with the provisions of the relevant CSA. The Transporter shall procure that verification of Measurement Equipment at a new Entry Point is carried out.

- 4.5.3 The Transporter shall, where relevant, use reasonable endeavours to exercise its rights under the relevant CSA in relation to the verification of any Measurement Equipment at an Entry Point.
- 4.5.4 The quantities of Natural Gas registered as being delivered at an Entry Point during the period when Measurement Equipment at such Entry Point is assumed, or evidenced, to have registered outside the Permitted Range shall be adjusted by a quantity corresponding to the quantity by which the Measurement Equipment at such Entry Point was found on verification to register outside the Permitted Range ("**Entry Point Adjustment Quantity**").
- 4.5.5 Each Shipper's share of the Entry Point Adjustment Quantity at the relevant Entry Point shall be shown in the next monthly statement rendered by the Transporter. Notwithstanding the deadline of D+5 for determining Final Allocations (as referred to in Part D (*Nominations, Allocations and NDM Supply Point Reconciliation*) Section 2 (*Allocations*)), in the event of an Entry Point Adjustment Quantity having to be made, an appropriate adjustment shall be made to what would otherwise have been such Final Allocation amount to reflect the corrected meter readings as set forth in this Section 4 and the Unaccounted For Gas shall be adjusted accordingly. For the avoidance of doubt, any such adjustment shall not affect such Shipper's Daily Imbalance Quantity and/or Overrun Quantity.

4.6 **Verification of Secondary Instrumentation**

- 4.6.1 The Transporter shall verify the Secondary Instrumentation with respect to Measurement Equipment at each LDM Offtake at least twice in each Gas Year. The Transporter shall verify the Secondary Instrumentation with respect to Measurement Equipment at each DM Offtake at least once in each Gas Year.
- 4.6.2 Subject to Section 4.8, where the Transporter of its own accord completes a verification of the Secondary Instrumentation with respect to Measurement Equipment at a LDM Offtake or a DM Offtake, the Transporter shall bear the cost of such verification.
- 4.6.3 A Shipper may at any time request that the Transporter carries out a verification of the Secondary Instrumentation with respect to Measurement Equipment at any LDM Offtake or DM Offtake at which such Shipper is offtaking Natural Gas and is the Registered Shipper.
- 4.6.4 Where the Transporter's verification in accordance with Section 4.6.1 was in the case of a LDM Offtake less than six (6) Months or, in the case of a DM Offtake less than twelve (12) Months prior to the date of the receipt by the Transporter of the request for such verification pursuant to Section 4.6.3, the Shipper shall be required to pay the cost of such verification to the Transporter.

- 4.6.5 The Transporter shall carry out a verification requested in accordance with Section 4.6.3 as soon as practicable after receipt by the Transporter of such request and (where required) payment of the cost of such verification in accordance with Section 4.6.4.
- 4.6.6 If a Shipper has requested that the Transporter carries out a verification of the Secondary Instrumentation in accordance with Section 4.6.3 and the Shipper has paid the cost of such verification pursuant to Section 4.6.4 and the verification proves that the Secondary Instrumentation is outside the level of uncertainty published by the Transporter pursuant to Section 4.3, then subject to Section 4.8, the Transporter shall credit such costs to the Shipper in the next Monthly Invoice.
- 4.6.7 Following verification in accordance with this Section 4.6, the Secondary Instrumentation of the Measurement Equipment shall, where found to read outside of the level of uncertainty published by the Transporter pursuant to Section 4.3, be adjusted, repaired or replaced to read centrally. Subject to Section 4.8, where such adjustment, repair or replacement is required, the Transporter shall bear the cost.
- 4.6.8 Any verification of the Secondary Instrumentation of the Measurement Equipment at LDM Offtakes and DM Offtakes in accordance with Section 4.6.3 shall be conducted by or on behalf of the Transporter. The Transporter shall give at least fourteen (14) Days' notice of such verification to the Shipper who shall be entitled to be present or be represented. The Shipper shall be liable for its own costs of attending any such verification of Secondary Instrumentation of the Measurement Equipment at a LDM Offtake or DM Offtake. The Transporter shall provide a verification report to the Shipper within ten (10) Business Days of the completion of any verification pursuant to Section 4.6.3 stating the results of the verification. The results of such verification shall be binding on both the Transporter and the Shipper unless the Shipper disputes the accuracy of the verification in a written notice to the Transporter within fifteen (15) Business Days of notification of the results of the verification. In the event that such dispute is not resolved within fifteen (15) Business Days of the Shipper serving such notice on the Transporter, either party may refer the matter for determination in accordance with Part I (*Legal and General*) Section 6 (*Dispute Resolution*).
- 4.6.9 Following a verification in accordance with this Section 4.6, if the Secondary Instrumentation of the Measurement Equipment at such LDM Offtake or DM Offtake is found to be outside the level of uncertainty published by the Transporter pursuant to Section 4.3, such Secondary Instrumentation shall be assumed to be outside the level of uncertainty during the lesser of: (a) the previous six (6) Month period; or (b) the latter half of the period of time since the last verification of the Secondary Instrumentation in accordance with Section 4.6, except where it is proved that the Secondary Instrumentation commenced to register outside the level of uncertainty on some other date.

- 4.6.10 The quantities of Natural Gas registered as offtaken during the lesser of the period since:
- (a) the Measurement Equipment is assumed or is proved to have registered outside the level of uncertainty pursuant to Section 4.6.9; or
 - (b) the Shipper became the Registered Shipper at such LDM Offtake or DM Offtake,

shall, notwithstanding the deadline of D+5 for determining Final Allocations (as referred to in Part D (*Nominations, Allocations and NDM Supply Point Reconciliation*) Section 2 (*Allocations*)) be adjusted by increasing or decreasing the metered quantity of Natural Gas at the Offtake Point for such period by a quantity corresponding to the quantity by which the Measurement Equipment was found on verification to register outside the level of uncertainty and such adjustment shall be processed in accordance with Section 4.9.

4.7 **Full Verification of Measurement Equipment**

- 4.7.1 The Transporter shall have the right to conduct a verification of Measurement Equipment at an Offtake Point (including the primary and secondary elements) at any time. Where the Transporter of its own accord completes a verification of Measurement Equipment at a LDM Offtake or DM Offtake, the Transporter shall bear the cost of such verification.
- 4.7.2 A Shipper may at any time request that the Transporter carries out a verification of Measurement Equipment (including the primary and secondary elements) at any LDM Offtake or DM Offtake at which such Shipper is offtaking Natural Gas and is the Registered Shipper. The Shipper shall be required to pay the cost of such verification to the Transporter.
- 4.7.3 The Transporter shall carry out the verification requested in accordance with Section 4.7.2 as soon as practicable after receipt by the Transporter of such verification request.
- 4.7.4 Where a Shipper has requested the Transporter to verify the Measurement Equipment pursuant to Section 4.7.2, the Shipper shall be obliged to pay the costs of such verification notified by the Transporter prior to the Transporter undertaking the verification, provided that' subject to Section 4.8, should the results of the verification prove that the Measurement Equipment recorded outside the Permitted Range, the Transporter shall be required to credit such costs previously paid by the Shipper to such Shipper in the next Monthly Invoice.
- 4.7.5 Any verification of the Measurement Equipment at LDM Offtakes and DM Offtakes in accordance with Section 4.7.2 shall be conducted by or on behalf of the Transporter. The Transporter shall give at least fourteen (14) Days' notice of such verification to the Shipper who shall be entitled to be present or

be represented. The Shipper shall be liable for its own costs of attending any such verification of the Measurement Equipment at a LDM Offtake or DM Offtake. The Transporter shall provide a verification report to the Shipper within ten (10) Business Days of the completion of a verification stating the results of the verification requested in accordance with Section 4.7.2. The results of such verification shall be binding on both the Transporter and the Shipper unless the Shipper disputes the accuracy of the verification in a written notice to the Transporter within fifteen (15) Business Days of notification of the results of the verification. In the event that such dispute is not resolved within fifteen (15) Business Days of the Shipper serving such notice on the Transporter, either party may refer the matter for determination in accordance with Part I (*Legal and General*) Section 6 (*Dispute Resolution*).

4.7.6 Following verification in accordance with this Section 4.7, the Measurement Equipment at a LDM Offtake or DM Offtake shall, where found to read outside the Permitted Range, be adjusted, repaired or, if necessary, replaced with Measurement Equipment which reads within the Permitted Range. Subject to Section 4.8, where such adjustment, repair or replacement is required, the Transporter shall bear the cost.

4.7.7 Following a verification in accordance with this Section 4.7, if the Measurement Equipment at a LDM Offtake or DM Offtake is found to register outside the Permitted Range, such Measurement Equipment shall be assumed to have registered outside the Permitted Range during the lesser of: (a) the previous six (6) Month period; (b) the latter half of the period of time since the last verification of the Measurement Equipment in accordance with Section 4.7; or (c) the period since the last Valid Meter Read, except where it is proved that the Measurement Equipment commenced to register outside the Permitted Range on some other date.

4.7.8 The quantities of Natural Gas registered as offtaken during the lesser of the period since:

- (a) the Measurement Equipment is assumed or is proved to have registered outside the Permitted Range pursuant to Section 4.7.7; or
- (b) the Shipper became the Registered Shipper at such LDM Offtake or DM Offtake,

shall, notwithstanding the deadline of D+5 for determining Final Allocations (as referred to in Part D (*Nominations, Allocations and NDM Supply Point Reconciliation*) Section 2 (*Allocations*)) be adjusted by increasing or decreasing the metered quantity of Natural Gas at such offtake for such period by a quantity corresponding to the quantity by which the Measurement Equipment was found on verification to register outside the Permitted Range and such adjustment shall be processed in accordance with Section 4.9.

4.8 **Damage to Measurement Equipment**

If the Transporter determines that the Measurement Equipment or any part thereof requires adjustment, replacement or repair due to any act, omission, negligence or default of any person other than the Transporter, the Shipper shall indemnify the Transporter for the costs of verification, adjustment, replacement and/or repair.

4.9 Adjustments to Metered Quantities

Any adjustment to the metered quantity of Natural Gas offtaken as referred to in Section 4.6.10 or Section 4.7.8 shall be shown in the next Monthly Invoice rendered by the Transporter to the Registered Shipper at such Offtake Point and Unaccounted For Gas shall be adjusted accordingly. Notwithstanding the foregoing, such adjustment shall not affect a Shipper's Daily Imbalance Quantity and/or Overrun Quantity.

4.10 Verification of Measurement Equipment at NDM Supply Points

4.10.1 The validation of a Meter Read with respect to a NDM Supply Point shall be conducted in accordance with the Meter Data Services Procedures.

4.10.2 A Shipper may request the testing of Measurement Equipment at a NDM Supply Point by making a request to the Transporter pursuant to any applicable procedures.

4.10.3 A Shipper may query a Meter Read with respect to a NDM Supply Point by submitting a query to the Transporter in accordance with the Meter Read Query resolution policy.

5. MAINTENANCE

5.1 General

- 5.1.1 The Transporter shall operate, maintain and repair the Transportation System in accordance with the provisions of this Code.
- 5.1.2 In maintaining the Transportation System, the Transporter shall comply fully with all Legal Requirements that are in force in the jurisdiction where the Transportation System is situated.
- 5.1.3 For the purposes of this Code:
- (a) "**Maintenance**" includes any inspection, overhaul, modification, repair, replacement, reinstatement, recommissioning, upgrade or extension of any part of the Transportation System and includes any works preparatory to such maintenance or required for the return to service of any part of the Transportation System after such maintenance;
 - (b) "**Maintenance Days**" means the Days, whether consecutive or not, nominated by the Transporter pursuant to this Section 5 as Days during which (i) acceptance of Natural Gas for delivery to that part of the Transportation System as may be subject to maintenance, or (ii) making Natural Gas available for offtake from that part of the Transportation System as may be affected by Scheduled Maintenance, may be reduced (if necessary down to zero) due to Maintenance on the Transportation System (and "**Maintenance Day**" shall be construed accordingly); and
 - (c) "**Scheduled Maintenance**" means planned Maintenance that would affect or limit the Transporter's ability to transport Natural Gas through the Transportation System or localised part thereof.

5.2 Maintenance

- 5.2.1 The Transporter shall carry out Scheduled Maintenance on the Transportation System during a Maintenance Day.
- 5.2.2 The Transporter shall determine the Maintenance required in respect of the Transportation System.
- 5.2.3 Subject to the limitation of the number of permitted Maintenance Days with respect to the Transportation System set out in Section 5.6.1, the Transporter shall be permitted to carry out Scheduled Maintenance on the Transportation System on any Day in a Gas Year.

5.3 **Maintenance Planning**

- 5.3.1 Each Shipper shall provide the Transporter as soon as reasonably practicable with the information the Transporter may require to:
- (a) plan the Maintenance of the Transportation System;
 - (b) comply with its obligations in respect of the Legal Requirements in relation to the Maintenance of the Transportation System; and
 - (c) prepare Maintenance Programmes.
- 5.3.2 The Transporter shall establish a provisional maintenance programme ("**Maintenance Programme**") which the Transporter shall make available to Shippers in respect of each Gas Year. The Maintenance Programme shall specify such maintenance as may affect delivery of Natural Gas to, or offtake of Natural Gas from, the Transportation System.
- 5.3.3 The Transporter shall plan the Scheduled Maintenance to minimise disruption to the Transportation System during Maintenance Days in as cost-effective, efficient and commercially prudent a manner as possible and to reconcile maintenance on any Connected Systems, Exit Points and Supply Points by co-ordinating where possible the Maintenance Days with the maintenance of any Connected Systems, Exit Points and Supply Points.

5.4 **Timetable**

- 5.4.1 The timetable for preparation of the Maintenance Programme for each Gas Year shall be as follows:
- (a) the Shippers will meet with the Transporter to discuss the Maintenance Programme for the following Gas Year during April and May of the preceding Gas Year and such consultations shall conclude before 31 May of such preceding Gas Year; and
 - (b) the Transporter shall notify the Shippers of Scheduled Maintenance for the following Gas Year by 30 September of the preceding Gas Year.
- 5.4.2 For each Gas Year, the Shippers will notify the Transporter of the maintenance requirements of their plant or systems (including any End User's Facilities) prior to 31 May of the preceding Gas Year.
- 5.4.3 The Transporter may revise the nature, timing and duration of any Maintenance Days notified to the Shippers as a result of circumstances that a Reasonable and Prudent Operator is unlikely to have foreseen by providing for additional Maintenance and/or by varying the dates or period(s) of any Scheduled Maintenance by giving affected Shippers:
- (a) which are Registered Shippers at affected LDM Exit Points or TCDM Exit Points not less than thirty (30) days notice; and

- (b) which are Registered Shippers at affected LDM Supply Points or DM Supply Points not less than seven (7) days' notice;

and in either case subject to a shorter period of notice being agreed between the Transporter and the affected Shippers.

5.5 Transporter's Obligations

To the extent that the Transporter cannot make Natural Gas available for offtake or accept into the Transportation System Natural Gas tendered for delivery at an Entry Point as a direct result of Maintenance, the Transporter will be relieved of its obligations to transport Natural Gas under this Code and any relevant LDM Agreement.

5.6 Maintenance Limits

5.6.1 Subject to Part I (*Legal and General*) Section 3 (*Force Majeure*), the Transporter will be limited to a maximum number of Maintenance Days for the carrying out of Scheduled Maintenance on the Transportation System or any localised part thereof as follows:

- (a) in respect of each Entry Point, a maximum of five (5) Maintenance Days in aggregate in any Gas Year, provided that, in addition to such Maintenance Days, the Transporter may take such additional Maintenance Days in respect of the Entry Point as are permitted in the relevant CSA to carry out Scheduled Maintenance;
- (b) in respect of each LDM Exit Point, a maximum of five (5) Maintenance Days in aggregate in any Gas Year, provided that in addition to such Maintenance Days, the Transporter may take such additional Maintenance Days in respect of the LDM Exit Point as are permitted in any relevant LDM Agreement;
- (c) in respect of each LDM Supply Point, a maximum of eight (8) Maintenance Days in aggregate in any Gas Year and twenty (20) Maintenance Days in aggregate in any three (3) consecutive Gas Years, provided that in addition to such Maintenance Days, the Transporter may take such additional Maintenance Days in respect of such LDM Supply Point as are permitted in the relevant LDM Agreement;
- (d) in respect of DM Offtakes, to a maximum of eight (8) Maintenance Days in aggregate in any Gas Year and twenty (20) Maintenance Days in aggregate in any three (3) consecutive Gas Years at each DM Offtake; and
- (e) in respect of NDM Supply Points, to a maximum of eight (8) Maintenance Days in aggregate in any Gas Year and twenty (20) Maintenance Days in aggregate in any three (3) consecutive Gas Years at each NDM Supply Point.

- 5.6.2 The limitations set out in Section 5.6.1 above shall be without prejudice to the rights of the Transporter to carry out any additional unscheduled Maintenance due to unforeseen circumstances which may be considered by the Transporter to be necessary and/or prudent in order to ensure the operational integrity and security of the Transportation System, subject to the Transporter having given each affected Shipper such notice as is reasonably practicable, recognising that such Maintenance is unscheduled.

5.7 **Capacity**

- 5.7.1 Shippers shall remain liable to pay the applicable Tariff during Maintenance Days in accordance with the provisions of this Code and/or any Ancillary Agreement.
- 5.7.2 The Transporter shall apply any reduction of capacity in the Transportation System resulting from Maintenance amongst any or all of the Shippers directly affected by such Maintenance on a fair, open (subject to relevant confidentiality obligations) and not unduly discriminatory basis. In applying any reduction in capacity between Shippers, the Transporter shall have regard to the order of priority set out in Part H (*Operations*) Section 1.9 (*Offtake Point Control*).
- 5.7.3 The Transporter shall apply any reduction in capacity affecting part of the Transportation System arising as a result of Maintenance amongst Shippers utilising that part of the Transportation System on a fair, open (subject to relevant confidentiality obligations) and not unduly discriminatory basis.
- 5.7.4 The Shippers shall assist the Transporter in its Scheduled Maintenance by using reasonable endeavours to offtake Natural Gas at an offtake in the manner requested by the Transporter.

5.8 **Maintenance at LDM Offtake**

The Transporter shall consult directly with each Registered Shipper at a LDM Offtake with respect to the effect of Maintenance on that part of the Transportation System in which the LDM Offtake is located.

APPENDIX 1
QUALITY SPECIFICATION OF NATURAL GAS AT ENTRY POINTS

(A) Gas Combustion Characteristics

Type of Gas	2nd Family Group H
Gross Calorific Value	36.5 to 47.2MJ/ml (Real Gross Dry)
Wobbe Index	45.7 to 54.7MJ/ml (Real Gross Dry)
Relative Density	0.55 to 0.7

(B) Upper Limits of Natural Gas Impurities

Hydrogen Sulphide Content	Not more than 5mg/ml
Total Sulphur Content	Not more than 50mg/ml
Oxygen Content	Not more than 0.1% (molar)
Carbon Dioxide Content	Not more than 2% (molar)
Nitrogen Content	Not more than 5% (molar)
Water Content	Not more than 50mg/ml
Hydrocarbon Dewpoint	Not more than -2°C at any pressure up to and including 85 barg
Contaminants	Mist, Dust, Liquid – Technically free in accordance with BS3156 11.0 1998

(C) Reference Conditions

All measurements at 15°Celsius and 101.325kPa.

APPENDIX 2

QUALITY SPECIFICATION OF NATURAL GAS AT OFFTAKE POINTS

(A) Gas Combustion Characteristics

Type of Gas	2nd Family Group H
Wobbe Index	45.7 to 54.7MJ /ml (Real Gross Dry)

(B) Upper Limits of Natural Gas Impurities

Hydrogen Sulphide Content	Not more than 5mg/ml
Total Sulphur Content	Not more than 50mg/ml
Oxygen Content	Not more than 0.2% (molar)
Contaminants	Natural Gas shall not contain solid matter which would have a material adverse impact on the ability to use Natural Gas at an Offtake Point.

(C) Reference Conditions

All measurements at 15°Celsius and 101.325kPa.