

INTERCONNECTION AGREEMENT

between

Hellenic Gas Transmission System Operator (DESFA) S.A.

and

Bulgartransgaz EAD

BUSINESS RULES

ARTICLE 1: DEFINITIONS

All terms of the INTERCONNECTION AGREEMENT shall have the meaning assigned to them as follows, while the rest of the terms used shall have the meaning defined in the Regulation (EC) 715/2009, Regulation (EU) 2015/703 and the Directive 2009/73/EC:

Border Metering Station (BMS) Sidirokastron: shall mean the border metering station, owned and operated by DESFA.

Confirmed Quantity shall mean the quantity of Natural Gas confirmed to be scheduled to flow on a Day at the IP, taking into account the nominated quantities for that Day at both sides of the IP and the matching process used for comparing and aligning the Natural Gas quantity requested by the Network Users to be transported at the IP.

Day shall mean a period from 7:00 a.m. Local Time of any calendar day to 7:00 a.m. Local Time of the next calendar day.

Daily Balance Position (DBP) shall mean a quantity calculated on a daily basis, for each Day D of the period of implementation of the **Operational Balancing Account (OBA)** allocation procedure. The calculation of DBP for a specific Day D is performed until 11:00 of the Day D+1, according to the following formula:

$$DBP^D = TDAQ^D - Q_M^D$$

Where:

Q_M^D is the measured quantity, expressed in kWh (reference combustion temperature 25°C) of the physical flow through the IP towards the Forward Flow Direction (assuming that in case of physical flow towards the Reverse Flow Direction the measured quantity is expressed as a negative value) during the Day D;

$TDAQ^D$ is the Total Daily Allocated Quantity during the Day D;

Exceptional event shall mean any unplanned event that is not reasonably controllable or preventable and that may cause, for a limited period, capacity reductions, affecting thereby the quantity or quality of Natural Gas at the IP, with possible consequences on interactions between DESFA and BULGARTRANGAZ as well as between DESFA and/or BULGARTRANGAZ and Network Users.

Forward Flow Direction shall mean the statistically prevailing Natural Gas flow direction, namely Natural Gas flow direction from Bulgaria to Greece.

Gross Calorific Value shall mean the quantity of heat produced by the full stoichiometric combustion with air of one (1) Normal Cubic Meter of Natural Gas under stable absolute pressure of 1.01325 bara when the initial temperature of the fuel mix and the final temperature of the combustion products is considered to be twenty five (25) degrees Celsius and the water produced during combustion is found condensed in the liquid state.

Identification Code (IC) shall mean the EIC or a unique identification code assigned by an Operator to a registered Network User to be used for identification in the procedures and systems administered by the Operator.

Interconnection Point Kulata (BG) / Sidirokastron (GR) (IP) shall mean the physical interconnection between the Natural Gas Transmission System operated by BULGARTRANGAZ and the Natural Gas Transmission System operated by DESFA at the Bulgarian – Greek border in the area of Kulata (BG) and Promachonas (GR). The quantity and quality measurements of the Natural Gas delivered at the IP shall be executed (performed) at the BMS Sidirokastron.

Limitation range (LR) shall mean the allowed range of values of the **Total Balance Position (TBP)**.

Local Time shall mean the Coordinated Universal Time (UTC) plus 2 hours for winter time and the Coordinated Universal Time plus 3 hours when daylight saving is applied.

Month shall mean a period from 7:00 a.m. Local Time on the first day of each calendar month to 7:00 a.m. Local Time on the first day of the next calendar month.

Network User shall mean a natural or legal entity that holds transportation capacity at the IP, on the basis of a transportation contract concluded either with DESFA and/or BULGARTRANGAZ. Each Network User is assigned a unique Identification Code (IC) by the respective Operator.

NGTS shall mean either the Greek or the Bulgarian Natural Gas Transmission System.

Normal Cubic Meter (m³(n)) shall mean one cubic meter of Natural Gas at ‘normal’ conditions of 273.15K (= 0°C) and 101,325 kPa (= 1.01325 bara).

Operational Balancing Account (OBA) is a joint account of the TSOs where the Daily Balance Position of both TSOs at the IP is recorded. DESFA is the TSO responsible for calculating, on a daily basis, the Daily Balance Position and the Total Balance Position and update the Operational Balancing Account accordingly.

Pair of Network Users shall mean the mutually served, in line with corresponding transportation contracts, Network Users at both sides of the IP.

Party shall mean one of the contractual PARTIES: DESFA or BULGARTRANGAZ.

Re-nomination Lead Time shall mean the time period between the start of a re-nomination cycle and the start of the hour at which change in gas flow, as a result of the re-nominations taken into account in that re-nomination cycle, takes effect.

Representative shall mean a person authorized to act on behalf of DESFA, BULGARTRANGAZ or a Network User.

Reverse Flow Direction shall mean the Natural Gas flow direction opposite to the Forward Flow Direction either in pure physical or in virtual way.

Standard Cubic Meter (m³(s)) shall mean one cubic meter of Natural Gas at ‘standard’ conditions of 293.15K (= 20°C) and 101,325 kPa (= 1.01325 bara).

Third Party shall mean any entity that sells or buys Natural Gas at the IP or any Network User at the IP.

Total Balance Position (TBP) shall mean the actual accumulation of DBP over a consecutive number of Days. The calculation of TBP for each Day D of the period of implementation of the OBA allocation procedure, is performed until 11:00 of the Day D+1, as follows:

1. For the first Day D of implementation of the OBA allocation procedure, the TBP is set equal to the DBP calculated for this Day D.

2. For each subsequent Day D and up to (and including) the last Day of the period of implementation of the OBA allocation procedure, the TBP for the Day D shall be calculated as the algebraic sum of the TBP of Day D-1 and the DBP for the Day D concerned.

Negative TBP indicates that DESFA is indebted towards the zero balance position, with a quantity equals to the absolute value of TBP. Positive TBP indicates that Bulgartransgaz EAD is indebted towards the zero balance position, with a quantity equals to the value of TBP.

Total Daily Allocated Quantity (TDAQ^D) shall mean a quantity defined as:

$$TDAQ^D = \sum_i Q_{Al.F,i}^D - \sum_j Q_{Al.R,j}^D$$

Where:

$Q_{Al.F,i}^D$ is the allocated quantity, expressed in kWh (reference combustion temperature 25°C) for a given pair of NUs in Forward Flow Direction, during the Day D;

$Q_{Al.R,j}^D$ is the allocated quantity, expressed in kWh (reference combustion temperature 25°C) for a given pair of NUs in Reverse Flow Direction, during the Day D;

i , is the pair of NUs active in the Forward Flow Direction during the Day D

j , is the pair of NUs active in the Reverse Flow Direction during the Day D

ARTICLE 4: BUSINESS RULES

4.1. Capacity

- 4.1.1. The Capacity is expressed in kWh/Day.

4.2. Processed / confirmed Natural Gas quantity

- 4.2.1. The processed / confirmed Natural Gas quantities are expressed in kWh (reference combustion temperature 25°C).

4.3. Matching process

- 4.3.1. Bulgartransgaz shall be the Initiating Transmission System Operator (ITSO).
- 4.3.2. DESFA shall be the Matching Transmission System Operator (MTSO).
- 4.3.3. The Network Users active at either (or both) side(s) of the IP are entitled to submit to the respective TSO(s):
 - (a) nominations until 15.00 Local Time of the Day (D-1), immediately preceding the Day concerned (D), and
 - (b) re-nominations, between 17:00 Local Time of the Day (D-1) immediately preceding the Day concerned (D), and 04:00 Local Time of the Day concerned (D).

A re-nomination cycle starts at the start of every hour, between 18:00 Local Time of day D-1 and 04:00 Local Time of day D. During each re-nomination cycle, the notification and matching procedure according to paragraphs 4.3.4, 4.3.5 and 4.3.6 shall apply.

- 4.3.4 ITSO and MTSO shall calculate, independently of each other, the capacity which could be interrupted per each Network User and Natural Gas Flow direction, by implementing the procedure of paragraphs 4.3.4.1 through 4.3.4.5 below:
- 4.3.4.1 Not later than 15 minutes upon the nomination deadline or the start of each re-nomination cycle, the Parties shall exchange information on the quantity nominated to flow through the IP, during the Day D, per each Pair of Network Users and Natural Gas flow direction, through a DELORD message, according to Edig@s XML format.
- 4.3.4.2 Based on the above information, each Party shall calculate the preliminary Processed Quantities per each Network User and Natural Gas flow direction, by applying the lesser rule on the Natural Gas quantities nominated (per each Pair of Network Users and Natural Gas flow direction) at either side of the IP. In case a Network User is part of more than one Pair of Network Users, its preliminary Processed Quantity, per each Natural Gas flow direction, is calculated as the sum of the results of the application of the "lesser rule" on the Natural Gas quantities nominated by the said Network User and its counterparty, active at the other side of the IP, at the specific Natural Gas flow direction.
- 4.3.4.3 Based on the results of paragraph 4.3.4.2 above, each Party shall calculate the expected physical Natural Gas flow through the IP (magnitude, direction) as the difference of the preliminary Processed Quantities of the Network Users, active at their side of the IP, during the Day D, in Forward and Reverse Flow Direction.
- 4.3.4.4 Each Party shall specify the total capacity which could be interrupted during the Day D, by subtracting the technical capacity of the IP (at Party's side) at the expected physical Natural Gas flow direction, from the expected physical Natural Gas flow (as it was calculated in paragraph 4.3.4.3 above). In case the result is negative or zero, no interruption is required and the Processed Quantities will be equal to the preliminary ones. In any other case the next steps shall apply:
- i. Each Party calculates the capacity which could be interrupted for each Network User, as the preliminarily Processed Quantity of the corresponding Network User minus the firm capacity booked by the said Network User, at the direction of the expected physical Natural Gas flow.
 - ii. In case of negative or zero result, the capacity which could be interrupted for this Network User equals to zero; otherwise the corresponding Party allocates the part of Network User's preliminary Processed Quantity, which is in excess to the capacity booked by the said Network User on a firm basis, to its interruptible capacity bookings, starting from the one assigned the oldest timestamp and moving to the most recent one.
 - iii. The Party shall calculate the capacity which could be interrupted per each Network User, as the sum of the Natural Gas Quantities assigned to each timestamp, starting from the most recent one, and applying the rule of art. 35 para 2 of EC Reg. 2017/459 (CAM NC), i.e. decrease proportionally to the preliminary Processed Quantities, which are in excess of Network User's booked capacity on a firm basis, until the sum of the Network Users' capacity which could be interrupted is equal to the value of total capacity which could be interrupted.

- 4.3.4.5 Each Party calculates the Processed Quantity per each Network User by reducing the preliminary Processed Quantity by the capacity which could be interrupted. In case one Network User is part of more than one Pair of Network Users, each Party allocates the capacity which could be interrupted per each Pair of Network Users the said Network User is part of, pro rata to the preliminary Processed Quantities, calculated as per paragraph 4.3.4.2.
- 4.3.5 Not later than 15.45 Local Time of the Day (D-1), immediately preceding the Day concerned (D), the ITSO shall send to the MTSO a DELORD message according to Edig@s-XML format regarding the Processed quantities, per each Pair of Network Users for the Day D at the IP. The Processed quantities are considered to be equally distributed to each hour of the Day D.
- 4.3.6 Not later than 45 minutes from the start of each re-nomination cycle, the ITSO shall send to the MTSO a DELORD message according to Edig@s-XML format regarding the Processed quantities, per each Pair of Network Users for the Day D at the IP.
- 4.3.7. Per each Pair of Network Users, the MTSO shall compare the Processed Quantity that has been scheduled for delivery/offtake, at each side of the IP and within 45 minutes after the receipt of the message under paragraph 4.3.5 or 4.3.6, a DELRES message shall be sent to the ITSO according to the Edig@s-XML format. In case of different Processed Quantities at either side of the IP, the lesser rule will be applied.
- 4.3.8 (a) In case the ITSO has not sent to the MTSO, until the expiration of the deadline specified in paragraph 4.3.5 above, the Processed quantities for a Day D, these will be considered, by the MTSO, equal to zero (0), for the implementation of the matching process.
- (b) In case the ITSO has not sent to the MTSO, until the expiration of the deadline specified in paragraph 4.3.6 above, the Processed quantities for a Day D, the MTSO shall consider, for the implementation of the matching process, the last Processed quantities of the Day D, which were sent by the ITSO to the MTSO.
- 4.3.9 (a) In case the MTSO has not sent the Confirmed quantities for a Day D to the ITSO, until the expiration of the deadline specified in paragraph 4.3.7 in relation to paragraph 4.3.5 above, the Confirmed quantities shall be considered equal to zero (0).
- (b) In case the MTSO has not sent the Confirmed quantities for a Day D to the ITSO, until the expiration of the deadline specified in paragraph 4.3.7 in relation to paragraph 4.3.6 above, the last Confirmed quantities, shall be considered as Confirmed quantities for this re-nomination cycle.
- 4.3.10 The matching processes under paragraph 4.3.4, 4.3.5, 4.3.6 and 4.3.7, shall be carried out using Edig@s-XML data format and AS4 protocol. In case the above communication method is not available (i.e. due to technical problems) the data exchange shall take place via email by using the forms of Annex 2.
- 4.3.11 The Re-nomination Lead Time is two (2) hours.

4.4. Network Users update

The Parties shall exchange the lists of their Network Users IC, as soon as possible, and in any case not later than two (2) working days before the Day a new Network User could start Natural Gas transmission at the IP.

4.5. Rules for the allocation of the transmitted gas quantities

- 4.5.1. In respect of the allocation of gas quantities, DESFA and BULGARTRANGAZ establish allocation procedure ensuring consistency between the allocated quantities at both sides of the IP. This allocation procedure shall be based on the Operation Balancing Account (OBA), specified below.
- 4.5.2. Under the OBA allocation procedure the Natural Gas quantity allocated for a Day D to a pair of Network Users at the IP shall be equal to the Natural Gas quantity confirmed for delivery/off-take, for that Day D, to the said pair of Network Users, according to article 4.3.

$$Q_{ALF,i}^D = Q_{CF,i}^D \text{ and}$$

$$Q_{ALR,j}^D = Q_{CR,j}^D,$$

where:

$Q_{CF,i}^D$ is the confirmed quantity, for a given Pair of Network Users in the Forward Flow Direction, during the Day D;

$Q_{CR,j}^D$ is the confirmed quantity, for a given Pair of Network Users in the Reverse Flow Direction, during the Day D;

$Q_{ALF,i}^D$ is the quantity allocated, to a given pair of Network Users in the Forward Flow Direction, during the Day D;

$Q_{ALR,j}^D$ is the quantity allocated, to a given pair of Network Users in the Reverse Flow Direction, during the Day D;

i , is the pair of Network Users active in the Forward Flow Direction during the Day D;
and

j , is the Pair of Network Users active in the Reverse Flow Direction during the Day D;

- 4.5.3. The OBA allocation procedure shall not be applied in the event that:
- 4.5.3.1. The conditions of paragraph 4.6.3 (i) and / or 4.6.4 (i) are met;
 - 4.5.3.2. The gas quality parameters are not in accordance with Art. 5.7 of the Agreement and the Parties are not able to perform their daily confirmations;
 - 4.5.3.3. The pressure is not according to the specifications in Art. 5.7 of the Agreement and the Parties are not able to perform their daily confirmations.
- 4.5.4. For each Day D, when any of the conditions in paragraph 4.5.3 is in effect, the daily measured quantity, increased by the Natural Gas quantity confirmed in the opposite to the gas flow direction, is allocated to the pairs of NUs proportionally to their confirmed Natural Gas quantities, in the gas flow direction through the IP. The quantities allocated to the pairs of NUs in the opposite to the gas flow direction is equal to the respective confirmed quantities. The OBA allocation procedure shall be re-applied on the next Day D+1 after the Day D in which all of the conditions in paragraph 4.5.3 are no longer in effect, unless both Parties mutually agree to postpone the application of the OBA for a specific period. Pro-rata allocated quantities in Forward direction shall be calculated by using the following formulas:

$$Q_{Al,F,i} = Q_{C,F,i} * \frac{Q_{M,F} + \sum_{j=1}^{nr} Q_{Al,R,j}}{\sum_{i=1}^{nf} Q_{C,F,i}}$$

Where:

$$Q_{Al,R,j} = Q_{C,R,j}$$

Subscripts:

Al : Allocated Quantity

C : Confirmed Quantity

M : Measured

nf : Number of pair of NUs in the Direction (F) – gas flow direction

nr : Number of pair of NUs in the Direction (R) – opposite to direction (F)

The same formula applies in case the measurement occurs in the Flow Direction (R), by switching the indices (F) and (R).

Each Day for which the pro-rata allocation procedure applies, the OBA is updated by calculating the TBP, considering DBP that equals to zero (0).

- 4.5.5. The indicative allocation of Natural Gas quantities shall be carried out via an ALOCAT message according to the Edig@s-XML format for each Pair of Network Users, on a daily basis, until 11.00 a.m. Local Time for the previous Day. The excel document-based data exchange method shall be used temporarily by the Parties as a back-up solution in case of failure of the above mentioned data exchange method.
- 4.5.6. The final allocation of Natural Gas quantities for each Day of the Month M, and for each Pair of Network Users, based on validated measurements, shall be carried out until 15:00 of the third calendar day of the Month immediately succeeding the Month M. The Monthly quantity allocation protocol shall be issued by DESFA and signed by BULGARTRANGAZ and shall be in accordance with the preliminarily approved forms as in Annex 2C. The quantity allocation protocol shall be accompanied with the respective measurement protocols for gas quantity and quality, where Natural Gas quantities are also expressed in volume units (0 and 20°C), for reference purposes only.
- 4.5.7. The data in the quantity allocation protocol shall be used by DESFA and BULGARTRANGAZ to prepare and sign quantity allocation protocols per each NUP active at the IP.

4.6. Operational Balancing Account

- 4.6.1. The Parties undertake to put effort so as to maintain TBP as close as possible to zero, in order to ensure that the LR specified in paragraph 4.6.2 is not violated.
- 4.6.2. The LR is specified by its lower limit value (LR_{low}), which is set to -8,500,000 kWh and its upper limit value (LR_{up}) which is set to 8,500,000 kWh. The lower and / or upper value of the LR may be changed upon mutual agreement of DESFA and

BULGARTRANGAZ, in case of justified operational needs, including but not limited to:

- (a) Exceptional events
- (b) Unplanned maintenance works
- (c) Scheduled flow below the BMS Sidirokastron minimum measurement and / or flow control limits.
- (d) Increase or decrease of the IP's technical capacity.

Upon written request issued by one of the Parties, the Parties may agree to expand the limits of the LR, prior to the execution of the indicative and / or the final allocation of the Natural Gas quantities for a Day D or for a certain number of Days.

4.6.3. In order to carry out the indicative allocation of the Natural Gas quantities to each Pair of Network Users, for a Day D, the Parties shall check whether the LR, applicable for that Day D, is violated.

(i) If for the Day D

$$TBP_{D-1} + \sum_i Q_{C,F,i}^D - \sum_j Q_{C,R,j}^D - Q_M^D > LR_{up}$$

or

$$TBP_{D-1} + \sum_i Q_{C,F,i}^D - \sum_j Q_{C,R,j}^D - Q_M^D < LR_{low}$$

the Parties shall carry out the indicative allocation of Natural Gas quantities in accordance with the provisions of paragraph 4.5.4.

(ii) If for the Day D

$$LR_{low} \leq TBP_{D-1} + \sum_i Q_{C,F,i}^D - \sum_j Q_{C,R,j}^D - Q_M^D \leq LR_{up}$$

the Parties shall carry out the indicative allocation of Natural Gas quantities in accordance with the provisions of paragraph 4.5.2.

4.6.4. In order to carry out the final allocation of the Natural Gas quantities to each Pair of Network Users, for each Day D of the Month M, the Parties shall check, based on validated measurements, whether the LR, applicable for that Day D, is violated.

(i) If for the Day D

$$TBP_{D-1} + \sum_i Q_{C,F,i}^D - \sum_j Q_{C,R,j}^D - Q_M^D > LR_{up}$$

or

$$TBP_{D-1} + \sum_i Q_{C,F,i}^D - \sum_j Q_{C,R,j}^D - Q_M^D < LR_{low}$$

the Parties shall carry out the final allocation of Natural Gas quantities in accordance with the provisions of paragraph 4.5.4.

(ii) If for the Day D

$$LR_{low} \leq TBP_{D-1} + \sum_i Q_{C,F,i}^D - \sum_j Q_{C,R,j}^D - Q_M^D \leq LR_{up}$$

the Parties shall carry out the final allocation of Natural Gas quantities in accordance with the provisions of paragraph 4.5.2.

- 4.6.5. Prior to the termination of the Interconnection Agreement, the Parties shall endeavour to settle in kind the TBP by adjusting the flow through the IP appropriately. If the TBP, that will be calculated at the last Day of implementation of the Interconnection Agreement is different than zero (0), then the Parties shall settle the TBP financially, within 30 days upon the Day of termination of the Interconnection Agreement, using as TBP unit price the arithmetic average of the marginal buy and marginal sell unit prices of balancing gas, without adjustments (if such adjustments are applicable), valid for the natural gas market of the creditor, for the Day of termination of the Interconnection Agreement. In case there are no applicable marginal prices of the balancing gas valid for natural gas market of the creditor, then the applicable daily price of balancing gas without adjustments will be used as a TBP unit price. The daily price of the balancing gas will be published on the internet site of the creditor. The balancing gas unit price, published and calculated by the creditor shall be in accordance with the methodology approved by the competent National Regulatory Authority.
- 4.6.6. DESFA shall issue and forward to BULGARTRNSGAZ the monthly OBA protocol until 15:00 of the third calendar day of the Month immediately succeeding the Month M. The OBA Protocol shall be in accordance with the standard form of Annex 9 of the Interconnection Agreement.
- 4.6.7. DESFA shall send daily to BULGARTRNSGAZ an Account Situation Document (ACCSIT) notification containing the TBP, in accordance with the Edig@s-XML format, not later than 11:00 Local Time on the Day D+1. The excel document-based data exchange method shall be used temporarily by the Parties as a back-up solution in case of failure of the above mentioned data exchange method.

5.6. Exceptional Event

- 5.6.1. Should an Exceptional event occur in the DESFA's or BULGARTRNSGAZ's Natural Gas Transmission System which influences or may influence the Natural Gas flow through the IP, the Party whose system is affected shall inform the other Party within thirty (30) minutes and take the necessary actions to minimize possible influence of such event on its Natural Gas Transmission System.
- 5.6.2. Within one (1) day from an Exceptional event occurrence, the affected Party shall prepare a report including as a minimum the following:
 - a) Description of the Exceptional event and the causes of its occurrence;
 - b) Hour of occurrence of the Exceptional event and the estimated time of its elimination;
 - c) Available IP capacity until the Exceptional event's elimination; and
 - d) Operations necessary for the restoration of the IP capacity;
- 5.6.3. The affected Party in whose system the Exceptional event occurred shall inform the other Party of the progress of the remedial actions. Mutual remedial actions will be agreed upon and applied, if needed.
- 5.6.4. Upon completion of the Exceptional event repair works, the affected Party shall inform the other Party of the restoration of the IP capacity.