



Translation from Romanian

KEY:

- black text: the original version.
- blue text: Articles amended by Orders of the RERA Chairman No. 68/25.06.2009, No. 78/10.09.2009, No. 30/11.11.2010, No. 41/22.12.2010, No. 25/22.06.2011, No. 38/28.09.2011, No. 39/28.09.2011, No. 54/22.12.2011 and No. 55/22.12.2011.

NOTE:

This version shall enter into force as of 1 April 2012.

NOTICE:

The English version of the Network Code is available for information purposes only. In the event of any discrepancies arising between the Network Code in the Romanian language and the Network Code in the English language, the provisions of the Romanian language version shall be legally binding.

Annex

THE NETWORK CODE OF THE NATIONAL GAS TRANSMISSION SYSTEM

CHAPTER I – GENERAL PROVISIONS

Scope

Article 1 The Network Code regulates conditions and rules for the operation of the Romanian National Gas Transmission System (NTS).



Article 2(1) The provisions of the Network Code for National Gas Transmission System, hereinafter referred to as The Network Code, are compliant with the provisions of the further amended and supplemented Gas Law No 351/2004, and with the provisions of the Regulation (EC) No 1775/2005 of the European Parliament and of the Council of 28 September 2005 on the conditions for access to the gas transmission networks, and are enforced by the National Gas Transmission Company (NGTC) 'Transgaz' S.A. Mediaș, hereinafter referred to as the *transmission system operator (TSO)*, by the users of the National Transmission System, hereinafter referred to as *network users (NU)*, by the gas producers, by the gas suppliers, as well as by the distribution system operators (*DSO*) and by the storage facility operators.

(2) The Romanian Energy Regulatory Authority, hereinafter referred to as the *Competent Authority (CA)* supervises the enforcement of the Network Code by the economic operators as mentioned in Paragraph (1).

Article 3 CA approves the amendment and/or supplementation of The Network Code, upon the proposal of the economic operators as mentioned in Article 2(1).

Article 4 The proposal for the amendment of The Network Code shall be submitted to the CA, in writing, and it shall specify all Sections of The Network Code to be amended and it shall be accompanied by:

- a) a brief presentation of the type and purpose of each proposed amendment;
- b) any other documents (reviews, reports etc.) providing arguments in favour of the proposed amendments.

Article 5 Upon receipt of any amendment proposal which is not comprehensive, CA shall reject it specifying the missing information/documents, which led to the rejection thereof, within five (5) working days.

Article 6 If the proposal for the amendment of The Network Code is comprehensive:



- a) CA shall notify all NTS users on the submission of the amendment proposal;
- b) CA shall publish the amendment proposal for consultation on its webpage, for at least twenty two (22) working days.

Article 7 When preparing such proposals for the amendment of The Network Code, TSO shall consider any legislative events impacting the applicable regulatory framework.

Article 8 Each amendment to The Network Code shall enter into force on the date of its publication in the Romanian Official Journal.

Article 9(1) For the purpose of this Network Code, the subsequent terms shall mean as follows:

Allocation	assignment by TSO of gas amounts to network users, at the entry and exit points, according to The Network Code.
Year	calendar year.
Gas year	Period of time starting at 06.00 A.M. on 1 July of the current year and ending at 06.00 A.M. on 1 July of the next year.
Competent Authority	Romanian Energy Regulatory Authority.
Booked transmission capacity	the capacity approved by TSO under contract, based on the request of NU, expressed in MWh/day, which TSO shall make available to NU at any time over the transmission contract duration, under firm or interruptible conditions.
NU customers	contractual partners of the network users, for which NUs conclude transmission contracts with TSO.
Basic condition	the specified conditions on which the measured gas



	amount is based.
Direct customers	the customer directly connected to NTS.
Accumulated unbalance	the sum of daily unbalances within a gas week.
Daily unbalance	The gap related to a gas day, between the gas quantities introduced in NTS and those taken over from NTS.
Capacity transfer facility (CTF)	mechanism by which the network users may directly transfer the capacity, under the conditions of The Network Code.
Gas transfer facility (GTF)	the possibility of transferring gas quantities, facilitated by TSO, for NU.
Use it or lose it	The lost of the right on the capacity approved and not used.
Force majeure	future event, unforeseeable and insurmountable, which exonerates from liability any default party.
Balanced gas	volumes of natural gas required to ensure the physical balancing of NTS under normal operating condition.
Importer	holder of the natural gas supply license, owner of the imported natural gas based on the legal documents, who transfers those quantities at the entry in NTS.
Month	calendar month
Balancing interval	tolerance for the accumulated unbalance. The network user who exceeds the balancing interval shall be charged with an unbalance tariff
Calibration log book	document where are recorded: the date, method and authorised person who carried out the calibration of the measuring heads at the entry point in/exit point out of the NTS.
Partner	producers, importers, suppliers, storage facilities



NU customers portfolio

operators, DSO, direct customers who have contractual relations with the NU.

all the customers of a NU, for which the latter one concludes transmission contracts with the DSO.

First-come, first-served

principle based on which TSO allocates the available capacity according to the order in which the requests were received, at each priority level.

Correlation procedure

procedure by which TSO comparatively analyzes the nomination of a network user at a certain entry or exit point with the partners' information on relevant entry or exit point. This procedure is applied if the nomination of a network user fails to correspond with the information received from the partners for a certain entry or exit point; the nominations from the NTS or the supply from/to adjacent system shall be reduced to the lowest level of the two values, according to the principle 'the lowest of'. This principle shall not apply if the partners from the adjacent systems fail to send the data.

Transmission schedule

Annual transmission chart sent to the network users and agreed with TSO where the monthly natural gas quantities which are to be transferred in/taken over from NTS are specified; this is an Annex to the transmission contract.

Exit point

A physical point or group of physical points through which the natural gas is taken over from the NTS.

Entry point

A physical point or group of physical points through which the natural gas is supplied in the NTS.

Natural gas week

Seven natural gas days starting with 06.00 A.M.,



	Romanian time, on a Wednesday and until 06.00 A.M. Romanian time the next Wednesday.
Transmission services	Activities and operations carried out by the TSO for or related to the booking of the transmission capacity and the transmission of the determined natural gas volumes through NTS, during the validity period of a contract.
Adjacent system	physical system connected to the NTS.
Daily tolerance	the levels of tolerance expressed in percentage for the total nomination at the exit points per natural gas day.
Energy unit	measurement unit whose value is expressed in kWh or GJ.
Unit volume	Measurement unit for volume expressed in cubic metres – m ³ – or thousand cubic metres – thousand m ³ .
Network user (transmission agent)	contractual partner of: <ul style="list-style-type: none">• TSO, under the transmission contracts;• suppliers, producers, importers, customers, distributors, storage facilities operators, under the contracts signed.
Pro rata	principle of proportional allocation by nomination of the natural gas quantities at NTS points applied by TSO to the network users, under the provisions of The Network Code.
Day	calendar day.
Natural gas day	time interval which starts at 06.00 A.M., Romanian time, every day and ends at 06.00 A.M., Romanian time, the following day. The natural gas day has 23 hours when passing to the summer time and it has 25 hours when



passing to the winter time, and all related rights and obligations, according to the natural gas transmission contracts, are accordingly decrease or increase in relevant natural gas days.

(2) The definitions of the terms from Paragraph (1) are completed by those in Gas Law No 351/2004, as further amended and completed, and by those in the Regulation (EC) No 1775/2005 on conditions for access to the natural gas transmission networks.

CHAPTER II – ENTRY/EXIT POINTS IN/FROM THE NTS

Article 10 This Chapter describes the entry/exit points in/from NTS for the network users, concerning the access to NTS, according to the procedures as defined in this Network Code.

Article 11 The entry and exit points in/from the NTS shall be published on the webpage of the TSO, in accordance with Article 18.

Entry Points in the NTS

Article 12 An entry point is a point where the network user supplies, under contract, natural gas in the NTS from adjacent systems and the point from where the natural gas transmission through NTS begins.

Article 13(1) The entry point is a physical point through which the natural gas enters in the NTS.

(2) CA may approve the creation of several virtual entry points from a physical point or the group of several physical points in a virtual entry point, upon the joint proposal of the NU and the TSO.

Article 14 The entry points in the NTS include:

- a) import entry points (IEP)



- b) entry points from the production fields (EPF)
- c) entry points in the underground storage facilities (EnPSF) (in the case of natural gas extraction from underground storage facilities).

Exit Points from the NTS

Article 15 An exit point is a point from where the network user takes over, under contract, natural gas from the NTS to the adjacent system and the point where natural gas transmission through NTS ends.

Article 16(1) The exits point is a physical point through which the natural gas is taken over from the NTS.

(2) CA may approve to group several exit points in a virtual exit point, upon the joint proposal of the NU and the TSO.

Article 17 The exit points from the NTS include:

- a) exit points to distribution systems;
- b) exit points to end-customers;
- c) exit points to underground storage facilities.

Information on the Technical Capacity of the Entry/Exit Points

Article 18 TSO shall publish on its webpage at least the information provided by the Regulation (EC) No 1775/2005.

Article 19 The available capacity for each point as defined above – published on the webpage by TSO – is a reference value.

Article 20 TSO updates this information at least once a month.



CHAPTER III – ACCESS TO THE TRANSMISSION SERVICES RELATED TO THE NTS

Article 21 TSO ensures the non-discriminatory access to the entire technical capacity in the NTS.

Article 22(1) The capacity necessary to the TSO in order to operate and maintain the system shall be submitted to CA for approval every year, by the 10th of January.

(2) If the TSO request is complete and justified, CA shall approve the relevant capacity by the 25th of January.

Article 22¹ Between 15 March and 15 April, the potential NU may declare in written their intention for capacity booking, under the conditions provided by The Network Code, in order to create an access account to the informatics application of the TSO for the configuration of the application for capacity booking.

(2) Notwithstanding the provisions in Paragraph (1) the potential NU may declare in writing their intention to book capacity for a gas day or multiple gas days, at least 6 business days prior to the date it requests the entering into force of the contract.

Article 23 (1) TSO grants the available capacity in the NTS at the entry/exit points to NU, based on the principle 'first-come, first-served' for each priority level, as follows:

- a) NU – for the capacities requested for the fulfilment of the public service obligations of the customers in its portfolio;
- b) NU – for the capacities requested for other purposes than the fulfilment of the public service obligations.

(2) Notwithstanding the provisions in Paragraph (2), the principles based upon which the capacity for the points interconnected with a third transmission system is granted shall be correlated with the agreements concluded between the parties.



Requirements on the Access to the Transmission Services Related to the NTS

Article 24(1) The capacity is booked by the NU by signing a transmission contract with the TSO, in accordance with the transmission framework-contract specified in Annex 1.

(2) The booked capacity is firm or interruptible.

Article 25 The conclusion of the transmission contract is subject to the fulfilment of the following requirements:

A. Financial requirements:

- (i) Before concluding the transmission contract, NU shall provide to the TSO the proof of the rating granted by a financial institution/rating agency;
- (ii) if the relevant rating is valid for a parent company of NU that request access, this shall be accompanied by a letter from the parent company by way of which it undertakes to guarantee the payment liabilities of NU that request access to the NTS;
- (iii) the proof of the rating for NU or parent company, accompanied by the letter for the commitment to guarantee the payment liabilities of NU, shall be presented upon the submission of the application for capacity reservation;
- (iv) the minimal rating level accepted shall be that granted to TRANSGAZ or its equivalent.
- (v) if the NU that requests access to NTS may not present the aforementioned rating, it shall present a financial guarantee issued by a financial institution (commercial bank), whose value should cover a minimum of 5% of the equivalent value of the requested capacity. The NU shall present the financial guarantee at least six (6) days before the conclusion of the transmission contract;
- (vi) the financial guarantee may be established in cash, or as guaranteed account (collateral deposit), and/or as payment guarantee (bank letter of guarantee) issued by a jointly agreed bank;



- (vii) if the tariff for the capacity booking is increased by over 20%, the value of the original guarantee shall be accordingly adjusted; the TSO shall notify all NU on this and shall request the adjustment of the original guarantee within five (5) calendar days from the increase of the tariff for the capacity booking.
- (viii) the financial guarantee provided under the draft contract is mutual and is activated by the parties right after the acceptance and signing of the transmission contract;

B. Technical requirements:

- (i) the TSO has an informatics application, developed in accordance with the provisions of this normative act, in order to communicate and exchange data with the NU;
- (ii) the NU must have an informatics application compatible with the informatics application of the TSO in order to inter-connect them;
- (iii) the NU shall have secured access to the informatics application of TSO and may choose on of the following versions for information exchange:
 - a) directly to the platform by web connection, provided that the NU has and communicated to TSO an email address dedicated to this operation;
 - b) use of edig@s standardised protocols.
- (iv) Upon NU request, TSO shall assist the NU in installing and shall train the NU in using the platform, for free.

Article 26(1) The failure to fulfil one or several of the access requirements aforementioned at any time during the validity of the transmission contract shall lead to its cancellation.

(2) TSO shall cancel the contract after the NU was priory notified; the notification shall be accompanied by a compliance term of minimum one business day.

Article 27(1) TSO shall publish on its webpage the identification data of all network users who meet the requirements needed for the conclusion of the transmission contract.



- (2) Within 2 months from the publishing of The Network Code in the Romanian Official Journal, the TSO shall prepare a procedure for the verification of the requirements specified in Article 25 for the network users that request the conclusion of the transmission contract.
- (3) The procedure specified in Paragraph (2) shall be approved by CA and published on the webpage of the TSO.

Capacity Booking

Article 27¹ The capacity is booked by entry/exit points in/from NTS, in energy units, by observing the equality principle: total capacity booked by entry points equals the total capacity booked by exit points, for the same NU.

Article 28(1) The network user is entitled to apply only for the capacity required:

- a) for the fulfilment of the contractual obligations according to its own customers portfolio;
- b) for the fulfilment of the storage contracts;
- c) for its own consumption.

Article 29(1) the NU is entitled to apply for the a capacity over that supported by customers portfolio, provided that the application is supported by documents with at least thirty (30) days before the beginning of the period for which the capacity is requested.

- (2) Transmission contracts may not be signed for the capacity which is not supported by the customer portfolio.
- (3) If the NU changes, the customer's capacity is automatically transferred to the new NU; TSO shall be priory notified within five (5) days.
- (4) the NU shall constantly update their customer portfolio and shall inform, within two (2) working days, TSO on the modifications made.
- (5) the TSO shall modify the transmission contracts accordingly.



Article 30 The capacity approved for an entry or exit point from the NTS may be transferred to another entry or exit point only if the TSO agrees, under the conditions of Article 84.

Article 30¹ For the entry/exit points in/from the NTS, irrespective of their owner regime, TSO is entitled to book capacity and to carry out the other operations provided in The Network Code.

Capacity Booking at Entry Points in the NTS

Article 31 For booking capacity at import entry points, the network user who requests capacity at these points shall issue a declaration, using the model in Annex 2, through which to support the request by excerpts from natural gas sale contracts concluded between its customers and the importers, from which to result the requested capacity.

Article 32 For capacity booking at entry points from production fields, the network user who requests capacity at these points shall issue a declaration, using the model in Annex 2, through which to support the request by excerpts from natural gas sale contracts concluded between its customers and the producers/suppliers, from which to result requested capacity, for each entry point from production fields for which the network user requests capacity.

Article 33 For capacity booking at the entry points in underground storage facilities (EnPSF) and at the exits points from underground storage facilities (ExPSF), the network user who requests capacity shall issue a declaration, using the model in Annex 2, through which to support the request by excerpts from the storage contract concluded with the underground storage facility operator at the entry/exit point, from which to result the requested capacity.

Article 34 If the network user has several effective contracts at the same entry/exit points in/from the NTS, and the periods for capacity booking overlap, the network user shall merge the capacity for these contracts.



Article 35 For the increase of the approved capacity, the network user shall follow the same procedure as for the request of capacity, according to the provisions of Article 37.

Article 36 The capacity at entry/exit points in/from the NTS may be requested by the NU:

- a) every year, between 15 April and 15 May, for one natural gas year or for multiple natural gas years;
- b) at least 6 working days before the date they request the contract to enter into force for one gas day or multiple gas days .

Capacity Request Procedure

Article 37(1) The NU applies for capacity booking in the NTS by filling in and sending the form 'Capacity request', using the model in Annex 3, together with the transmission schedule, directly to the informatics application, in accordance with the provisions of Article 25(B).

(2) If NU cannot directly send to the platform the documents specified in Paragraph (1), due to technical problems related to the blackout of the platform, the form and the transmission schedule shall be sent by fax and email.

(3) The high calorific value in energy units (MWh/day) taken into account for the capacity booking is determined as a mean of the high calorific values measured during the pervious natural gas year for each point taken into consideration.

(4) The high calorific values determined according to Paragraph (3) shall be published on the webpage of the TSO and shall be valid for the whole natural gas year.

Article 38(1) For the capacity booking for one natural gas year, TSO shall send to NU by 15 June if access to NTS is granted to it or not and TSO shall send also the (total or partial) rejection's reasons, as well as the possible comments to the proposed Transmission schedule.

(1¹) For capacity booking for a shorter period than one gas year, the TSO must communicate to the NU, in two working days form the receipt of the request, if it grants access to the NTS or the



reasons for its refuse (total or partial) as well as the possible observations to the proposed transmission schedule.

(2) The TSO sends the approval or refusal notification for capacity granting according to the model included in Annex no. 4.

Article 39 In case of total or partial refuse, the network user may send within one working day a written objection, to which TSO shall give a response within one working day.

Article 40 The TSO shall keep records of the approvals and refuses of granting capacity for each network user, in order to inform the Competent Authority, at least once a year.

Article 41 TSO is entitled to refuse without any explanation the applications for capacity which fail to meet the terms provided in Article 36.

Article 42 If the requested capacity is (totally or partially) approved, TSO shall send two copies of the transmission contract within one working day from the approval date specified in the notification. The dispatch of the two copies of the transmission contract means a contracting offer.

Article 43(1) If the requested capacity is not approved, the notification shall clearly explain the reason of the refusal.

(2) The following may be reasons of a refusal:

- a) the circumstances set forth in Article 64 of Law No 351/2004, as further amended and completed;
- b) the documents accompanying the request for capacity do not justify it after 15 May. In order to justify the application for capacity after 15 May, NU shall prove that the request for capacity after that date could not be determined upon the submission of the request for annual capacity;
- c) the NU fails to meet the requirements provided in Article 25;



- d) the NU fail to meet the requirement provided in Article 27¹;
- e) the NU has outstanding debts resulted from the fulfilment of previous transmission contracts, except for the debts incurred as result of the fulfilment of NU obligation of public service.

Article 44 If the network user agrees with the draft transmission contract sent by TSO, it shall activate the financial guarantee, where appropriate under the conditions set forth in Article 25(A) and return the copies of the transmission contract, signed by TSO, to be countersigned, within one working day form their receipt date.

CHAPTER IV – PROVISION OF THE TRANSMISSION SERVICE

Article 45(1) For the implementation of the transmission contract, the network user has the responsibility to inform TSO on the supplies and takeovers of natural gas in/from the NTS, planned at all entry and exit points where the network user booked capacity; the information shall be under the form of the transmission schedule and of the nominations, observing the procedure and terms set forth in this Section.

(2) Upon the preparation of the transmission schedule and of the nominations, the network users shall take into consideration the planned works causing a decrease or an interruption of the capacity in the NTS.

(3) The TSO shall publish on its webpage the periods for the planned maintenance works, as follows:

- a) no later than the 1st of March, for the next natural gas year;
- b) no later than the 1st of December, the possible modifications for the period 1January– 30 June of the current natural gas year;

(4) the TSO shall inform the NU, at least 15 days before, on the actual date of the works provided in Paragraph (3).



- (5) The network users shall be informed about any possible modification of the planned works chart, in accordance with the provisions of the applicable performance standard.
- (6) If the scheduled planned works, notified in accordance with Paragraph (3), is changed, the NU can modify by mutual agreement with TSO the transmission schedule and the nominations.

Transmission Schedule

Article 46(1) The transmission schedule shall be prepared by the NU, using the model in Annex 5, the following shall be specified for each month:

- a) the quantity of natural gas expressed in energy units for each entry point in the NTS where the NU booked capacity;
 - b) the quantity of natural gas expressed in energy units for each exit point from the NTS where the NU booked capacity.
- (2) The NU sends the transmission schedule straight to the informatics application, in accordance with the procedure set forth in Article 25(B).
 - (3) If the NU cannot directly send to the platform the documents specified in Paragraph (1), due to technical problems related to the blackout of the platform, the transmission schedule shall be sent by fax and email.
 - (4) The high calorific value in energy units (MWh/day) taken into account for the preparation of the transmission schedule is determined as a mean of the high calorific values measured during the pervious natural gas year for each point taken into consideration weighted by the volumes of natural gas.
 - (5) The high calorific values determined according to Paragraph (4) shall be published on the webpage of the TSO and shall be valid for the whole natural gas year.
 - (6) The operative parameters of the physical entry and/or exit points in/from NTS (lowest pressure, highest pressure, capacity, quantities of energy), as well as the parties' rights and obligations for meeting these parameters shall be subject to some bilateral arrangements concluded by the TSO with the producers, the storage facilities operators and the distribution systems operators, by 15 May for the next natural gas year.



(7) The operative parameters of the physical entry and/or exit points in/from the NTS set in the bilateral arrangements shall be published on the webpage of the TSO, according to the provisions set forth in Article 18, and shall be at the basis of the conclusion of the transmission contracts.

Article 47 The transmission schedule shall be attached to the transmission contract. The network user may modify the transmission schedule for the following month or for the remaining of the natural gas year, after the beginning of the natural gas year, but before 02.00 P.M. of the 20th day of each month, the latest.

Article 48(1) The transmission schedule may be modified by the written notification of the NU. The notification shall be drawn up according to the model in Annex 6.

(2) The NU sends the notification straight to the informatics application, in accordance with the provisions of Article 25(B).

(3) If the NU cannot directly send to the platform the document specified in Paragraph (1), due to technical problems related to the blackout of the platform, the notification shall be sent by fax and email.

Nomination and re-nominations

Article 49(1) The nomination is an engaged information that the network user sends to the TSO, and which has to be approved by the TSO in order to be applied.

(2) The nominations of the network users shall be performed weekly and in any natural gas day, observing the terms set forth in this Section. If the network user fails to send the nomination by the relevant terms, the provisions of Article 52 shall be applied.

(3) If differences between the values nominated by the network user and those actually allocated are observed, a tariff for the failure to observe the nomination shall be charged, according to the provisions of Article 105.

Article 50(1) The following principles shall be observed for the nomination and re-nomination:



- a) the nomination may be done only once for a natural gas week;
 - b) the re-nomination may be done only once for a natural gas day;
 - c) the NU may make only one nomination and re-nomination at a certain entry or entry point in or from the NTS, even if the NU has several partners for that point. In this situation, the capacity shall be merged, according to the provisions of Article 34;
 - d) the nomination or re-nomination may not exceed the highest capacity booked for the relevant entry or exit point in or from the NTS;
 - e) Each NU shall deliver to the TSO balanced nominations and re-nominations, the daily energy supplied in the NTS shall be equal to that daily taken over from the NTS.
 - f) the nominations and re-nominations for the entry and exits points shall be equal to those agreed by the NU with its customers and communicated, where appropriate, to the underground storage facilities operators, to the producers, to DSO and to importers.
- (2) The nomination or re-nomination that fails to meet the aforementioned conditions shall be rejected by TSO and NU shall be informed about this.

Nominations made by the Network Users

Article 51 (1) By 02.00 P.M., every Monday of every natural gas week $n-1$, the network users send to TSO the nomination for the n natural gas week, using the model in Annex 7, and specifying the following for each day of the n natural gas week:

- a) the quantity of natural gas, expressed in energy units, for each entry point in the NTS where the network user booked capacity;
 - b) the quantity of natural gas, expressed in energy units, for each exit point from the NTS where the network user booked capacity and the percent designated for the householder and respectively non-house holder customers;
 - c) the partner from each entry and exit point in and from the NTS.
- (2) The network users send the transmission schedule straight to the informatics application, in accordance with the procedure set forth in Article 25(B).



(3) If the NU cannot send straight to the platform the document specified in Paragraph (1), due to technical problems related to the blackout of the platform, the nomination shall be sent by fax and email.

Article 52(1) If the network user fails to send a nomination for each entry and exit point in and from the NTS, by observing the terms provided in this Section, TSO shall automatically record, without the prior consent of the network user, the nomination at an equal value to the daily energy arithmetic mean, according to the latest transmission program send by the network user for the relevant month.

(2) This action of the TSO is not based on a legal relation of mandate between the network user and the TSO.

Article 53 The TSO shall inform the network user, by observing the terms and procedures hereunder, on the approval or rejection of the nomination, both for nomination made by the network user and the nomination made for the network user by the TSO, in accordance with the provisions of Article 52.

Article 54 The TSO shall prepare and constantly update the records on nomination approvals/rejections and shall deliver it to the CA, any time when requested.

Article 55 Before answering to the network user's request for nomination, the TSO shall make these steps:

- a) the correlation between the nomination sent by the network user and the information received by the network user's partners from the adjacent system, for each entry and exit point in and from the NTS for which the network user sent the nomination;
- b) check whether the sum of the energy nominated by the network user at all entry points in the NTS where the network user booked capacity is equal to the sum of energy at all exit



points in the NTS where the network user booked capacity, for each natural gas day included in the nomination.

Article 56 If the nomination sent by the network user fails to correspond to the information received by the network user's partners in adjacent systems, for certain entry and exit points in or from the NTS, the nomination or the supply from/to an adjacent system shall be decreased to the lowest level of the relevant two values.

Article 57 By 12.00 P.M., every Tuesday of every natural gas week $n-1$, the latest, TSO shall inform the network user about the approval or the rejection of the nomination for the n natural gas week.

Re-nominations made by the Network Users

~~**Article 58** — The network user may send only one re-nomination for a natural gas day.⁴~~

Article 59 (1) Re-nominations for n natural gas day may be made by 03.00 P.M., in the $n-1$ natural gas day, the latest.

(2) The economic operators specified in Article 2(1) take all necessary actions in order to be able to send the re-nomination for the weekend days and for the legal holidays, in accordance with the provisions of Paragraph (1).

Article 60 (1) The re-nominations shall be drawn up according to the model in Annex 7.

(2) The NU sends the re-nominations directly to the informatics application, in accordance with the provisions of Article 25(B).

(3) If the NU cannot directly send to the platform the document specified in Paragraph (1), due to technical problems related to the blackout of the platform, the nomination shall be sent by fax and email.

¹ ~~Article 58 is abrogated.~~



Article 61 When receiving the re-nomination sent by the network user on n day, but no later than 04.00 P.M., in the $n-1$ natural gas day, the TSO shall inform the network user about the approval or rejection of the re-nomination for n natural gas day.

Article 62 Before responding to the network user, the TSO:

- a) shall check if the sent re-nominations meet the booked capacity for each entry/exit point;
- b) shall correlate the re-nominations sent by the NU and the information received by the partners of the NU in the adjacent systems, for each entry and exit point in and from the NTS for which the NU sent the re-nomination;
- c) shall verify if the sum of the energy re-nominated by the NU at all entry points in the NTS where the NU booked capacity is equal to the sum of the energy at all exit points from the NTS where the NU booked capacity for the natural gas day for which NU sent the re-nomination.
- d) TSO shall reject the sent re-nomination if this fails to meet the conditions provided at Letters a) - c) and shall consider the approved nomination as valid.

Article 63 If the re-nominations sent by the network user differ from the appropriate information received by the network user's partners in adjacent systems for certain entry and exit points in and from NTS, the nominations in the NTS or the supply from/to an adjacent system shall be decreased to the lowest level of the relevant two values.

Article 64(1) A re-nomination may be totally or partially rejected if it fails to meet the conditions provided in Article 50(1).

- (2) If a re-nomination is totally rejected, the nomination properly approved shall remain valid.
- (3) If the TSO totally approves a re-nomination, this becomes the approved nomination.
- (4) A re-nomination which is adjusted by TSO, with the consent of the network user, in order to meet the terms and conditions provided in Article 50 becomes the approved nomination.



Article 65 The NU must accept a temporary decrease of the approved capacity and nomination, if the TSO, the storage facility operator or DSO does not accept the natural gas which was to be supplied to the NU, because that natural gas fails to meet the minimum quality requirements provided in the legislation in force.

Natural Gas Transfer Facility

Article 66(1) The gas transfer facility (GTF) means the possibility of (virtually) transferring natural gas quantities from a network user (named hereinafter the transferring network user) to another network user (named hereinafter the transfer beneficiary network user).

(2) The natural gas is transferred under a bilateral contract between the transferring network user and transfer beneficiary network user for the same entry/exit points, without the consent of the TSO, or between different points, if this is technically possible, and with the consent of the TSO.

(3) GTF may take place:

- a) *ex-ante* – previous to n natural gas day
- b) *ex-post* – after n natural gas day

in accordance with the procedures provided in this Section.

(3) The natural gas may be transferred for minimum one natural gas day. GTF may be effective only from the beginning of the relevant natural gas day.

(4) The transferring network user and the transfer beneficiary network user are directly responsible for not reaching a daily unbalance or an accumulated unbalance by resorting to the natural gas transfer facility.

Ex-ante GTF

Article 67(1) The *ex-ante* GTF between the network users may not be approved by the TSO.

(2) After they agreed on the natural gas transfer, both the transferring NU and the transfer beneficiary the NU shall inform the TSO about the quantities of natural gas to be transferred by GTF and to properly re-nominate the quantities of natural gas at the entry/exit points in/from NTS.



If there are several transferring NU that transfer to one transfer beneficiary NU by GTF, the transfer beneficiary NU shall specify the quantities of natural gas it wants to receive from each of the transferring NU.

(3) GTF shall be agreed prior to the terms for re-nomination. The procedures for the re-nomination provided in Articles 58-65 shall apply for the re-nomination related to GTF.

Ex-post GTF

Article 68 (1) The *ex-post* GTF may take place within maximum 48 hours from the moment when the network users were informed by the TSO about their final accumulated unbalance. The natural gas may be transferred only for the same natural gas day.

(2) After they agreed on the natural gas transfer, both the transferring network user and the transfer beneficiary network user shall inform the TSO about the quantities of natural gas, expressed in energy units, to be transferred by GTF. If there are several transferring network users that transfer to one transfer beneficiary network user by GTF, the transfer beneficiary network user shall specify the quantities of natural gas – expressed in energy units – it is to receive from each of the transferring network users.

(3) The TSO shall accordingly recalculate the daily unbalance for the specified natural gas days and the accumulated unbalance for the relevant natural gas day(s) (relevant gas weeks).

(4) The *ex-post* gas transfer between the network users must be approved by the TSO. The *ex-post* gas transfer between the network users may be rejected if the daily unbalance caused by the network user before the natural gas transfer prevented TSO to fulfil its obligations of public service and the obligations towards other network users or it affected the safety of the NTS operation.

GTF Tariff

~~Article 69 The transferring network user and the transfer beneficiary user shall be charged with a GTF tariff, according to the provisions of Article 104²~~

² Article 69 is abrogated



Allocations

Article 70 (1) For every approved nomination, the TSO allocates the quantities of natural gas which correspond to the takeovers, respectively to the actual supplies through the entry/exit point in/from the NTS.

- (2) The allocation may be temporary or final.
- (3) The temporary allocation is made using actual measurements of the natural gas consumption and consumption profiles approved by CA, as appropriate.
- (4) The final allocation is made using actual measurements of the natural gas consumption and consumption profiles approved by CA or other allocation methods approved by CA.
- (5) For the purpose of the allocation, the importers/storage facilities operators/producers shall specify and certify the high calorific power (HCP) of the natural gas supplied through the entry points in the NTS.
- (6) By 12.00 P.M., the TSO informs the DSO daily about the quantities of natural gas measured or determined based on the consumption profiles (as the case may be) at the entry points and their high calorific power (HCP) for $n-1$ natural gas day.
- (7) If TSO fails to provide the information requested in Paragraph (6), no penalties are charged to the NU for $n-1$ day and for $n+1$ day.
- (8) The TSO takes all necessary actions in order to be able to send the information for the weekend days and for the legal holidays, provided in Paragraph (6), to DSO, and the latter takes all actions required for the data processing.
- (9) The consumption profiles of the entry points in the NTS shall be jointly prepared by the DSO and TSO and shall be approved by the CA.

General Principles for Allocation

Article 71 (1) The general principles for allocation prepared by the TSO and approved by CA shall be unitary to all entry/exit points in/from the NTS.

- (2) TSO informs NU as follows:



- a) for each $n-1$ natural gas day, by 02.00 P.M. in the n - natural gas day, the latest, the allocation of the supply and the value of the temporary unbalance;
- b) for each $n-1$ natural gas week, by 04.00 P.M. in the first natural gas day of the n - natural gas week, the latest, the value of the temporary accumulated unbalance;
- c) no later than one week after the end of the month – the final daily allocation, the value of the final daily unbalance and the final accumulated unbalance for each natural gas week.

Allocation at the Entry Points in the NTS

Article 72(1) If, for one gas day, two or several network users nominated supplies through the same import entry point, for the same importer, the actual supplies in the NTS shall observe these principles:

- a) in case of supply deficit, the quantities of natural gas shall be proportionally allocated to the network users based on their approved nominations (*pro rata*) or based on the allocation methods prepared by the TSO and approved by CA;
- b) in case of supply surplus, the quantities of natural gas shall be allocated to the relevant network users at the level of the approved nominations, plus a margin of 2.5%. The gas supplied as surplus over the level of the nomination plus the margin of 2.5% becomes the property of the TSO, at a price fixed by the Order of the President of CA.

(2) If several importers supply natural gas to network users through the same import entry point, TSO shall apply the same allocation procedure for each importer.

Article 73 (1) If, for one gas day, two or several network users nominated supplies through the same entry point from production fields from the same producer, the actual supplies in the NTS shall observe these principles:

- a) in case of supply deficit, the quantities of natural gas shall be proportionally allocated to the network users based on their approved nominations (*pro rata*) or based on the allocation methods prepared by the TSO and approved by CA;



- b) in case of supply surplus, the quantities of natural gas shall be allocated to the relevant network users at the level of the approved nominations, plus a margin of 2.5%. The gas supplied as surplus over the level of the nomination plus the margin of 2.5% becomes the property of TSO, at a price fixed by the Order of the President of CA.

Article 74 (1) If, for one gas day, two or several network users nominated supplies through the same entry point from an underground storage facility, the actual supplies in the NTS shall observe these principles:

- a) in case of supply deficit, the quantities of natural gas shall be proportionally allocated to the network users based on their approved nominations (*pro rata*) or based on the allocation methods prepared by the TSO and approved by CA;
- b) in case of supply surplus, the quantities of natural gas shall be allocated to the relevant network users at the level of the approved nominations, plus a margin of 2.5%. The gas supplied as surplus over the level of the nomination plus the margin of 2.5% becomes the property of the TSO, at a price fixed by the Order of the President of CA.

Allocation according to the Gas Transfer Facility

Article 75(1) The allocation by GTF shall be made by the TSO both for the transferring network user and for the transfer beneficiary.

(2) The natural gas volumes allocated by GTF for each network user shall correspond to the quantities of natural gas transferred between the network users.

Allocation at the Exit Points from the NTS

Article 76 (1) The allocation made by the TSO for a direct customer shall be made based on the information displayed by the metering tools installed in the regulating-metering stations (RMS) or based on the consumption profiles prepared by the TSO and approved by CA and delivered to the network users (which concluded supply contracts with those customers).



(2) If several network users supply natural gas to a direct customer, the quantities shall be proportionally allocated to them based on the approved nominations (*pro rata*).

(3) The provision on the proportional allocation between NU based on the approved nominations may be replaced by another allocation principle agreed by the NU and the direct customer, and submitted to the TSO no later than $n-1$ natural gas day.

Article 77 (1) At the exit points from the NTS to the distributions systems, the quantities of natural gas metered/estimated based on the profiles of the relevant RMS, in accordance with Article 70(9), shall be allocated based on the consumption profiles or on the allocation methods agreed between NU and DSO and submitted to TSO by NU no later than $n-1$ natural gas day.

(2) If the NU fails to provide the allocation methods – specified in Paragraph (1) – to TSO by 02.00 P.M. in $n-1$ natural gas day, the latest, for n natural gas day, the total quantities metered shall be allocated to the NU based on the information displayed by the metering tools, based on the consumption profiles of the relevant RMS, in accordance with Article 70(9), or, if such profiles are not available, based on the *pro rata* principle.

(3) At the exit points from the NTS to the storage facilities, the quantities of natural gas metered shall be allocated by the TSO based on the data provided by the storage facility operator (SFO), data determined based on the allocation methods agreed between the storage facility operator together with NU and the owner of the natural gas.

(4) If SFO fails to provide the data requested in Paragraph (3) to TSO, by 02.00 P.M. in $n-1$ natural gas day, the latest for n natural gas day, TSO shall allocate the total quantities measured to NU based on the *pro rata* principle.

(5) The economic operators specified in Article 2(1) take all necessary actions in order to be able to send the information requested in Paragraphs (1) – (4) for the weekend days and for the legal holidays.

Article 78 (1) At each exit point, the TSO shall supply natural gas to the user of the network at least at the level of the approved nomination.



- (2) If the daily natural gas takeover of a network user at an exit point from the NTS has a deviation higher or equal to 15% of the nomination for two (2) natural gas days, the TSO may totally or partially interrupt the supply of natural gas to the relevant network user at the exit point, according to Paragraph (1).
- (3) At each entry point, the TSO shall take over the quantities of the natural gas from the network user at most at the level of the approved nominations.
- (4) If the total daily natural gas transfer of a network user at an entry point in NTS has a deviation higher or equal to 15% of the nomination for one (1) natural gas day, the TSO may interrupt or request the interruption, totally or partially, as the case may be, of the transfer of natural gas from the relevant network user at the entry point, according to Paragraph (3).
- (5) If the request of TSO is not complied with, according to Article (4), TSO shall notify CA.

Article 79 The TSO may totally or partially interrupt the supply of natural gas only after sending to the NU a 24 hours notice before the interruption/limitation.

Article 80 The TSO may reduce the percentage specified in Article 78(2) if the technical parameters of the system request it.

Article 81 If the TSO fails to provide transmissions services by more than 3% of the approved nomination, it shall pay to the network user a tariff for the supply under nominated quantity, according to Article 107, for the difference between the threshold specified and the quantities of natural gas actually supplied.

Congestion Management in the NTS

Article 82 The capacity approved but not used by the network user may be subject to:

- a) voluntary return to TSO, according to Article 83;
- b) capacity transfer facilities, according to Article 84;



- c) Mandatory transfer from a network user to another performed by the TSO, according to Article 86.

Voluntary Capacity Return

Article 83 (1) The network user may offer to return the approved capacity to the TSO, totally or partially.

(2) The period of approved capacity return may span only from the beginning of the natural gas month for which it was approved by TSO (totally or partially), to the end of the natural gas year.

(3) The TSO shall take over the booked capacity offered by the network user, only if another network user requests that capacity

(4) The network user shall send an application for voluntary capacity return to the TSO, where it shall specify:

- a) the contract person of the network user, the address, the telephone number, the fax number and the email address;
- b) the capacity to be returned;
- c) the registration number of the transmission contract.

(5) TSO shall notify the network user about the decisions to approve/reject the application, within five (5) working days from the receipt date of the application.

(6) If several network users apply for capacity, their applications shall be processed based on 'first-come, first-served' principle.

(7) If several network users apply for voluntary capacity return, their applications shall be processed based on 'first-come, first-served' principle.

(8) The network user does not pay the capacity that was voluntarily returned to the TSO.

(9) The TSO shall modify the transmission contract accordingly.

(10) The TSO shall keep records of the voluntary capacity return, which he shall deliver to the Competent Authority.



Capacity Transfer Facility

Article 84 (1) The capacity transfer facility (CTF) is an instrument by which the network users carry out mutual capacity transfer.

(2) The network user who intends to transfer capacity (hereinafter named transferring network user) and the network user that wants to take over capacity (hereinafter named transfer beneficiary network user) shall notify for this purpose the TSO.

(3) CTF is effective starting with the following month.

(4) The capacity may be totally or partially transferred. The period of partial capacity transfer may start only from the beginning of the month for which the TSO approved the capacity transfer to the end of the natural gas year.

(5) The TSO shall accordingly amend the transmission contracts concluded with the transferring network user and with the transfer beneficiary network user.

Article 85 (1) The transferring network user and transfer beneficiary network user shall submit an application for capacity transfer/takeover to the TSO, according to the model in Annex 8.

(2) The application for capacity transfer shall be received by the TSO with minimum five (5) working days before the transfer.

(3) If the capacity transfer is not approved, the TSO shall clearly specify the reason of the rejections, with minimum three (3) working days before the transfer.

(4) The following may be reasons of the refusal:

- a) the data in the application for capacity transfer are inaccurate or incomplete;
- b) the transferring network user has not concluded a transmission contract with the TSO;
- c) the transferring network user does not have the capacity which he requests to transfer;
- d) the transfer beneficiary network user cannot justify why the application for new/additional capacity was not submitted by 15 May;
- e) the transfer beneficiary network user fails to meet the requirements provided in Articles 25 and 26, taking into consideration the new or additional capacity.



- (5) the TSO shall amend accordingly the transmission contract concluded with the transferring network user and shall amend or sign a transmission contract with the transfer beneficiary network user, as the case may be, before the approved transfer date.
- (6) The transferring network user shall no longer pay the capacity transferred by CTF.

Mandatory Capacity Transfer

Article 86 (1) If the TSO refuses a network user because of the lack of capacity for over a month, the TSO shall inform all network users which have approved transmission contracts about the requested capacity and shall advise them to offer the relevant capacity to the network user by CTF or by voluntary capacity return to the TSO.

(2) At the same time, the TSO shall send to all network users with approved transmission contracts the application for reporting within five (5) working days their actual capacity demand for the specified period, accompanied with supporting documents.

(3) If the TSO receives no offer of voluntary capacity return and is informed that the network user did not receive any offer for the requested capacity by CTF within ten (10) working days from the date when the network user was informed, the TSO shall evaluate the clarifications and the information received, in accordance with Paragraph (2).

(4) If the TSO considers the clarification unjustified or if the network user fails to provide the aforementioned information, the TSO is entitled to start a mandatory capacity transfer.

(5) If several network users are in the same situation, the start of the mandatory capacity transfer is applied proportionally with the unjustified capacity for all these network users.

(6) In case of mandatory capacity transfer, the TSO shall inform in written the network user about the decision made, specifying the reasons that justify this transfer.

(7) In the circumstance provided in Paragraph (6), the TSO shall unilaterally and accordingly amend the transmission contract.

(8) If the network user considers the mandatory capacity transfer as unjustified and discriminatory, it may address CA.



(9) The network user subject to a mandatory capacity transfer shall pay further on the remaining capacity and it shall also pay 5% of the transferred transmission capacity, from the date of the mandatory capacity transfer to the last day of the natural gas year.

(10) The TSO shall keep records of the mandatory capacity transfers which he shall deliver to CA, any time requested.

(11) The TSO shall develop the capacity at the point where some physical congestions are noticed.

NTS Balancing

Article 87 The (physical and commercial) NTS balancing defines a series of activities and procedures required to ensure the transmission of natural gas through NTS under safety conditions and to allocate the natural gas quantities to the network users.

Physical Balancing

Article 88 (1) The physical balancing means the management and balancing of the natural gas quantities transmitted through the NTS by means of monitoring and control of flow, pressure and high calorific power parameters at the entry and exit points, as well as at other points of control of the NTS.

(2) According to the effective legal provisions, the TSO may own natural gas only for balancing the system and for operating the NTS under safety conditions. In order to actually balance the NTS, each network user shall:

- a) reserve the required capacity at the entry and exit points of the NTS for the transmission of natural gas related to its customer portfolio;
- b) store in underground storage facilities natural gas needed for the seasonal balancing of the natural gas quantities related to its customer portfolio;
- c) ensure the balance between the nominated natural gas quantities, which are to be injected in the NTS at the entry points, and the nominated natural gas quantities, which are to be taken over from the NTS at the exit points for the customers portfolio of the network user.



(3) In order to balance the natural gas flow fluctuation and in order to maintain the pressure at values which enables the operation of the NTS under safety conditions, TSO shall have enough natural gas capacity to balance the system, as storage in the pipelines and as natural gas for balancing stored in underground storage facilities (in order to maintain the storage in the pipelines).

(4) The procedures adopted by the TSO for the physical balancing of the NTS mainly contain the balance of the differences occurred between the nomination and the actual takeovers or caused by some unexpected circumstances.

Article 89 (1) The TSO dispatching office receives the nominations for every natural gas day from the network users in every natural gas week.

(2) The calculations made by the TSO to improve the natural gas flow in the NTS contain for each natural gas day of the following week these data:

- a) forecast of the natural gas quantities stored in the pipelines at the beginning of the natural gas day;
- b) forecast of the natural gas quantities stored in the pipelines at the end of the day;
- c) identification of the restrains if it is forecast that the supplies will exceed the available capacity at the relevant location (e.g. through pipeline sections which are to be repaired);
- d) identification of the requirements on the usage of the underground storage facilities.

Commercial Balancing

Article 90 (1) The daily unbalance means the difference between the natural gas quantities actually supplied at the entry points and those actually taken over at the exit points from the NTS by each network user in a certain natural gas day.

(2) The accumulated unbalance means the difference between the natural gas quantities actually supplied at the entry points and those actually taken over at the exit points from NTS by each network user in a certain natural gas week and it is equal to the sum of the daily unbalances for each natural gas day of the relevant natural gas week.



- (3) The commercial balancing is made by the TSO with the equations and procedures specified in this section.
- (4) In order to calculate for each network user the daily and accumulated unbalance, the TSO uses the balancing equations and the allocation values.
- (5) The TSO uses the temporary allocations to calculate the temporary daily unbalance of each natural gas day and the temporary accumulated unbalance of each natural gas day, which it provides to the network users within the terms specified in Articles 91-93.
- (6) At the end of the month, based on the final allocations, the TSO recalculates the daily unbalances and the accumulated unbalance for each network user.
- (7) For every natural gas day when the daily unbalance exceeded the daily tolerance provided in Table 1, the network users shall be charged with the daily unbalance tariff provided in Table 6.
- (8) Within 48 hours from the receipt of the information on the final accumulated unbalance, the network users may carry out *ex-post* transfers by GTF, in accordance with the provisions of Article 68.
- (9) When the 48 hours term expires, for each natural gas week when the accumulated unbalance exceeded the balancing limits provided in Table 2, the network users shall be charged with the accumulated unbalance tariff provided in Table 7.
- (10) The values of the natural gas quantities and of the high calorific power, determined based on the procedures prepared by the TSO within 2 months from the publishing of The Network Code in the Official Journal of Romania and endorsed by CA, shall be used in the balancing equations provided hereunder.
- (11) The TSO shall suggest transparent procedures for the parameters provided hereunder, which shall be endorsed by the competent institutions:
 - a) energy of the natural gas for the technological consumption localised-determined;
 - b) energy of the natural gas for the technological loss not localised-estimated;
 - c) energy of the natural gas for the loss localised in the NTS;
 - d) energy variation of the natural gas stored in pipelines.

Balancing Equations

A. General Balancing Equation for the NTS

$$E_{PROD} + E_{IMP} + E_{S.FACILITY}^{EXTR} = E + E_{TCLd} + E_{TCNe} + E_{LL} + \Delta E_{STOR.inPIPE} + E_{S.FACILITY}^{INJ} \quad (1)$$

where:

- E_{PROD} - the energy of natural gas transferred in the NTS through the entry points from the productions fields by all network users and that introduced in the NTS by the TSO through the aforementioned points.

For a number $i = \overline{1, n}$ of network users, and a number $j = \overline{1, p_{prod}}$ of entry points from production fields, E_{PROD} may be expressed as follows:

$$E_{PROD} = \sum_{i=1}^n \sum_{j=1}^{p_{prod}} E_{PROD_j}^{NU_i} + \sum_{j=1}^{p_{prod}} E_{PROD_j}^{TSO} \quad (2)$$

- E_{IMP} - the energy of natural gas transferred in NTS through the import entry points by all network users and that introduced in NTS by TSO through the aforementioned points.

For a number $i = \overline{1, n}$ of network users, and a number $k = \overline{1, p_{imp}}$ of import entry points, E_{IMP} may be expressed as follows:

$$E_{IMP} = \sum_{i=1}^n \sum_{k=1}^{p_{imp}} E_{IMP_k}^{NU_i} + \sum_{k=1}^{p_{imp}} E_{IMP_k}^{TSO} \quad (3)$$

- $E_{S.FACILITY}^{EXTR}$ - the energy of natural gas transferred by all network users through all entry/exit points in/from the storage facilities which are in the extraction cycle, and that introduced in the NTS by the TSO through the aforementioned points.

The term has two components:

$$E_{S.FACILITY}^{EXTR} = E_{S.FACILITY}^{SOURCEEXTR} + E_{S.FACILITY}^{BALANCEEXTR} \quad (4)$$

where:

- $E_{S.FACILITY}^{SOURCEEXTR}$ - the energy of natural gas transferred in the NTS as source by all network users through all entry/exit points in/from the storage facilities which are in the extraction cycle, and that introduced in NTS by TSO through the aforementioned points.

For a number $i = \overline{1, n}$ of network users, and a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in/from storage facilities, $E_{S.FACILITY}^{SOURCE_{EXTR.}}$ may be expressed as follows:

$$E_{S.FACILITY}^{SOURCE_{EXTR.}} = \sum_{i=1}^n \sum_{l=1}^{P_{stor.}} E_{S.FACILITY_1}^{SOURCE_{EXTR.}} + \sum_{l=1}^{P_{stor.}} E_{S.FACILITY_1}^{SOURCE_{EXTR.-TSO}} \quad (4.1)$$

$E_{S.FACILITY}^{BALANCE_{EXTR.}}$ - the energy of natural gas transferred in the NTS for balancing by all network users through all entry/exit points in/from the storage facilities which are in the extraction cycle, and that introduced in the NTS by the TSO through the aforementioned points.

For a number $i = \overline{1, n}$ of network users, and a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in/from storage facilities, $E_{S.FACILITY}^{BALANCE_{EXTR.}}$ may be expressed as follows:

$$E_{S.FACILITY}^{BALANCE_{EXTR.}} = \sum_{i=1}^n \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_1}^{BALANCE_{EXTR.}} + \sum_{l=1}^{P_{stor.}} E_{S.FACILITY_1}^{SOURCE_{EXTR.-TSO}} \quad (4.2)$$

E - the energy of natural gas taken over from the NTS by all network users through all exit points, except for those related to the storage.

For a number $i = \overline{1, n}$ of network users, and a number $m = \overline{1, p}$ of exit points from NTS, E may be expressed as follows:

$$E = \sum_{i=1}^n \sum_{m=1}^p E_m^{NU_i} \quad (5)$$

- E_{TCLd} - the energy of natural gas for the technological consumption localised-determined – means the energy of natural gas consumed by the TSO to carry out the transmission of natural gas through the NTS.

The term E_{TCLd} is calculated as the sum of the following energies:

- the energy of gas used as fuel for the consumption of the compression stations;
- the energy of gas used as fuel for the heating of the technological gas and premises;
- the energy of gas exhausted from pipelines for ~~when~~ cleaning them of impurities;
- the energy of gas exhausted for purging the impurities from the liquids separators;
- the energy of gas exhausted for the periodic verification and regulation of the safety valves;



- the energy of gas used for repairs, rehabilitation and development of the NTS.

The aforementioned energies are calculated by using an average calorific value for the entire NTS.

- E_{TCNe} - the energy of natural gas for the technological consumption not localised-estimated – means the energy of natural gas accidentally exhausted from the NTS.

The term E_{TCNe} is calculated as the sum of the following energies:

- the energy of gas exhausted because the pipelines normal operative duration was exceeded;
- the energy of gas exhausted through leakages of the dismountable joints due to the operative wear;
- the energy of gas exhausted through the safety valves due to the accidental pressure increase;
- the energy of gas exhausted due to technical accidents (cracks, breaks).

The aforementioned energies are calculated by using an average calorific value for the entire NTS.

- E_{LL} - the energy of natural gas for the loss localised in the NTS – means the energy of natural gas quantities which should be taken over by one or several network users, but which was lost because of some failures localised in a section nearby one or several physical exit points from the NTS.

For a number $i = \overline{1, n}$ of network users, E_{LL} may be expressed as follows:

$$E_{LL} = \sum_{i=1}^n E_{LL}^{NU_n} \quad (7)$$

where: $E_{LL}^{NU_n}$ - the energy which was nominated but which was not taken over by the network users i at the exit points affected by a failure localised in NTS:

If the natural gas loss localised in the NTS affects only one network user r , the component $E_{LL}^{NU_n}$ is determined by this formula:

$$E_{LL}^{NU_i} = E_{nominated}^{NU_i-affected} - E_{taken\ over}^{NU_i-affected} \quad (8)$$

where: $E_{nominated}^{NU_i-affected}$ - the energy which was nominated by the network user i at the exit points affected by a failure localised in the the NTS;

$E_{taken\ over}^{NU_i-affected}$ - the energy which was taken over by the network user i at the exit points affected by a failure localised in NTS;

Observation: the component E in equation (1) includes the term $E_{taken\ over}^{NU_i-affected}$.

If the natural gas loss localised in NTS affects two or several network users, the component E_{LL} is assigned for each of them is using by this formula:

$$E_{LL}^{NU_i} = E_{LL} \times \frac{E_{nominated}^{NU_i-affected}}{\sum_{affected} E_{nominated}} \quad (9)$$

where: $\sum_{affected} E_{nominated}$ - the sum of energies nominated by all network users at the exit points affected by a failure localised in the NTS;

The term E_{LL} included in the equation is only for balancing.

The TSO shall recover, on its own expense, all losses localised in the NTS, except for the cases of force majeure.

Upon the presentation by the network user of the appropriate documents supporting the gas cost, the TSO shall ensure:

- financial compensation, within one (1) calendar month, or
 - the lost quantity of natural gas, on a date mutually agreed, according to the settlement procedure agreed by the parties.
- $\Delta E_{STOR.inPIPE}$ - the energy variation of the natural gas stored in the component pipelines of the NTS – means the difference between the energy contained in the NTS at the beginning of a natural gas day and the energy contained in the NTS at the end of the relevant natural gas day.

- $E_{S.FACILITY}^{INJ}$ - the energy of natural gas taken over from the NTS by all network users and that taken out from the NTS by the TSO through all entry/exit points in the storage facilities which are in the injection cycle.

The term has two components:

$$E_{S.FACILITY}^{INJ} = E_{S.FACILITY}^{SOURCE_{INJ}} + E_{S.FACILITY}^{BALANCE_{INJ}} \quad (10)$$

where:

$E_{S.FACILITY}^{SOURCE_{INJ}}$ - the energy of natural gas taken over from the NTS as source by all network users and that taken out from the NTS by the TSO through all entry/exit points in the storage facilities which are in the injection cycle.

For a number $i = \overline{1, n}$ of network users, and a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in storage facilities, $E_{S.FACILITY}^{SOURCE_{INJ}}$ may be expressed as follows:

$$E_{S.FACILITY}^{SOURCE_{INJ}} = \sum_{i=1}^n \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_1}^{SOURCE_{INJ}-NU_i} + \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_1}^{SOURCE_{INJ}-TSO} \quad (10.1)$$

$E_{S.FACILITY}^{BALANCE_{INJ}}$ - the energy of the natural gas taken over from the NTS for balancing by all network users and that taken out from the NTS by the TSO through all entry/exit points in the storage facilities which are in the injection cycle.

For a number $i = \overline{1, n}$ of network users, and a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in storage facilities, $E_{S.FACILITY}^{BALANCE_{INJ}}$ may be expressed as follows:

$$E_{S.FACILITY}^{BALANCE_{INJ}} = \sum_{i=1}^n \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_1}^{BALANCE_{INJ}-NU_i} + \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_1}^{BALANCE_{INJ}-TSO} \quad (10.2)$$

B. Balancing equation for the Network User

$$E_{PROD}^{NU_i} + E_{IMP}^{NU_i} + E_{S.FACILITY}^{EXTR-NU_i} + E_{GTF}^{g.received-NU_i} + E_{IC}^{NU_i} = E_{LL}^{NU_i} + E_{S.FACILITY}^{INJ-NU_i} + E_{GTF}^{g.transferred-NU_i} \quad (11)$$

where:



- $E_{PROD}^{NU_i}$ - the energy of natural gas transferred in NTS by the network user i , through all entry points from the production fields.

For a number $j = \overline{1, P_{PROD}}$ of entry points from the production fields, $E_{PROD}^{NU_i}$ is calculated by this formula:

$$E_{PROD}^{NU_i} = \sum_{j=1}^{P_{PROD}} E_{PROD_j}^{NU_i} = \sum_{j=1}^{P_{PROD}} (V_{PROD_j}^{NU_i} \times HCP_j) \quad (12)$$

where:

$V_{PROD_j}^{NU_i}$ - means the volume of natural gas from production fields transferred in the NTS by the network user 'i' through the entry point 'j';

HCP_j - means the determined high calorific power of the entry point 'j' from the production fields.

- $E_{IMP}^{NU_i}$ - the energy of import natural gas transferred in the NTS by the network user 'i' through all entry points.

For a number $k = \overline{1, P_{IMP}}$ of import entry points, $E_{IMP}^{NU_i}$ is calculated by this formula:

$$E_{IMP}^{NU_i} = \sum_{k=1}^{P_{IMP}} E_{IMP_k}^{NU_i} = \sum_{k=1}^{P_{IMP}} (V_{IMP_k}^{NU_i} \times HCP_k) \quad (13)$$

where:

$V_{IMP_k}^{NU_i}$ - means the volume of import natural gas transferred in the NTS by the network user 'i' through the import entry point 'k';

HCP_k - means the determined high calorific power of the import entry point 'k'.

- $E_{S.FACILITY}^{EXTR-NU_i}$ - the energy of natural gas transferred in the NTS by the network user 'i' through all entry/exit points in the storage facilities which are in the extraction cycle.

The term has two components:

$$E_{S.FACILITY}^{EXTR-NU_i} = E_{S.FACILITY}^{SOURCE_{EXTR.-NU_i}} + E_{S.FACILITY}^{BALANCE_{EXTR.-NU_i}} \quad (14)$$

where:

$E_{S.FACILITY}^{SOURCE_{EXTR.}-NU_i}$ - the energy of natural gas transferred in NTS as source by the network user 'i' through all entry/exit points in the storage facilities which are in the extraction cycle.

For a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in the storage facilities, $E_{S.FACILITY}^{SOURCE_{EXTR.}-NU_i}$ is calculated by this formula:

$$E_{S.FACILITY}^{SOURCE_{EXTR.}-NU_i} = \sum_{l=1}^{PIMP} E_{S.FACILITY_l}^{SOURCE_{EXTR.}-NU_i} = \sum_{l=1}^{PIMP} (V_{S.FACILITY_l}^{SOURCE_{EXTR.}-NU_i} \times HCP_l) \quad (14.1)$$

where:

$V_{S.FACILITY_l}^{SOURCE_{EXTR.}-NU_i}$ - means the volume of natural gas transferred in the NTS as source by the network user 'i' through entry/exit point 'l' in the storage facilities which are in the extraction cycle;

HCP_l - means the determined high calorific power of entry/exit point l in the storage facilities.

$E_{S.FACILITY}^{BALANCE_{EXTR.}-NU_i}$ - the energy of natural gas transferred in the NTS for balancing by the network user 'i', through all entry/exit points in the storage facilities which are in the extraction cycle.

For a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in the storage facilities, $E_{S.FACILITY}^{BALANCE_{EXTR.}-NU_i}$ is calculated by this formula:

$$E_{S.FACILITY}^{BALANCE_{EXTR.}-NU_i} = \sum_{l=1}^{PIMP} E_{S.FACILITY_l}^{BALANCE_{EXTR.}-NU_i} = \sum_{l=1}^{PIMP} (V_{S.FACILITY_l}^{BALANCE_{EXTR.}-NU_i} \times HCP_l) \quad (14.2)$$

where:

$V_{S.FACILITY_l}^{BALANCE_{EXTR.}-NU_i}$ - means the volume of natural gas transferred in the NTS for balancing by the network user 'i' through entry/exit point 'l' in the storage facilities which are in the extraction cycle;

HCP_l - means the determined high calorific power of entry/exit point l in the storage facilities.

- $E_{GTF}^{g.received-NU_i}$ - the energy of natural gas received by the network user i from one or several network users by gas transfer facility.

The term $E_{GTF}^{g.received-NU_i}$ is calculated as the algebraic sum of all quantities of gas – expressed in energy units – received by gas transfer facility by the network user 'i'.



- $E_{IC}^{NU_i}$ - the unbalance component of the network user 'i' – means the energy of natural gas required to maintain the balance of the network user 'i' customer portfolio.

The term $E_{IC}^{NU_i}$ is the actual result of the balancing equation for the network user 'i' (11).

$E_{IC}^{NU_i}$ may have as value:

- zero – meaning that the network user 'i' maintained the balance of its customer portfolio;
- positive – meaning that the network user 'i' gas takeovers from NTS are higher than the transfers;
- negative – meaning that the network user 'i' gas takeovers from NTS are lower than the transfers.

- E^{NU_i} - the energy of natural gas taken over from NTS by the network user i, through all exit points, except for those of the storage facilities,

For a number $m = \overline{1, p}$ of exit points from NTS, except for those of the storage facilities, E^{NU_i} is calculated by this formula:

$$E^{NU_i} = \sum_{m=1}^p E^{NU_i} = \sum_{m=1}^p (V_m^{NU_i} \times HCP_m) \quad (15)$$

where:

$V_m^{NU_i}$ - means the volume of natural gas taken over from NTS by the network user i through the exit point m;

HCP_m - means the determined high calorific power of the exit point m.

- $E_{LL}^{NU_i}$ - the energy of natural related to the loss localised in NTS, which should have been taken over by the network user i.

The term $E_{LL}^{NU_i}$ is calculated by formulas (8) and (9).

- $E_{S.FACILITY}^{INJ-NU_i}$ - the energy of natural taken over from NTS by the network user i through all entry/exit points in the storage facilities which are in the injection cycle.

The term has two components:

$$E_{S.FACILITY}^{INJ-NU_i} = E_{S.FACILITY}^{SOURCE_{INJ-NU_i}} + E_{S.FACILITY}^{BALANCE_{INJ-NU_i}} \quad (16)$$

where:

$E_{S.FACILITY}^{SOURCE_{INJ-NU_i}}$ - means the energy of natural gas taken over from the NTS as source by the network user i through all entry/exit points in the storage facilities which are in the injection cycle;

For a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in the storage facilities, $E_{S.FACILITY}^{SOURCE_{INJ-NU_i}}$ is calculated by this formula:

$$E_{S.FACILITY}^{SOURCE_{INJ-NU_i}} = \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_l}^{SOURCE_{INJ-NU_i}} = \sum_{l=1}^{P_{S.FACILITY}} (V_{S.FACILITY_l}^{SOURCE_{INJ-NU_i}} \times HCP_l) \quad (16.1)$$

where:

$V_{S.FACILITY_l}^{SOURCE_{INJ-NU_i}}$ - means the volume of natural gas taken over from the NTS as source by the network user i through the entry point l in the storage facilities which are in the injection cycle;

HCP_l - means the determined high calorific power related to the entry/exit point l in the storage facilities.

$E_{S.FACILITY}^{BALANCE_{INJ-NU_i}}$ - the energy of natural gas taken over from the NTS for balancing by the network user ' i ' through all entry/exit points in the storage facilities which are in the injection cycle.

For a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in the storage facilities, $E_{S.FACILITY}^{BALANCE_{INJ-NU_i}}$ is calculated by this formula:

$$E_{S.FACILITY}^{BALANCE_{INJ-NU_i}} = \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_l}^{BALANCE_{INJ-NU_i}} = \sum_{l=1}^{P_{S.FACILITY}} (V_{S.FACILITY_l}^{BALANCE_{INJ-NU_i}} \times HCP_l) \quad (16.2)$$

where:

$V_{S.FACILITY_l}^{BALANCE_{INJ-NU_i}}$ - means the volume of natural gas taken over from the NTS for balancing by the network user ' i ' through the entry/exit point ' l ' in the storage facilities which are in the injection cycle;

HCP_l - means the high calorific power related to the entry/exit point ' l ' in the storage facilities.

- $E_{GTF}^{g.transferrd-NU_i}$ - the energy of natural gas transferred by the network user 'i' to one or several network users by gas transfer facility.

The term $E_{GTF}^{g.transferrd-NU_i}$ is calculated as the algebraic sum of all quantities of gas – expressed in energy units – transferred by gas transfer facility by the network user i.

C. Balancing Equation for TSO

$$E_{PROD}^{TSO} + E_{IMP}^{TSO} + E_{S.FACILITY}^{EXTR-TSO} + E_{RBC}^{TSO} = E_{TCLd} + E_{TCNe} + \Delta E_{STOR.inPIPE} + E_{S.FACILITY}^{INJ-TSO} \quad (17)$$

where:

- E_{PROD}^{TSO} - the energy of natural gas introduced in the NTS by the TSO, through all entry points from the production fields.

For a number $j = \overline{1, P_{PROD}}$ of entry points from production fields, E_{PROD}^{TSO} is calculated by this formula:

$$E_{PROD}^{TSO} = \sum_{j=1}^{P_{PROD}} E_{PROD_j}^{TSO} = \sum_{j=1}^{P_{PROD}} (V_{PROD_j}^{TSO} \times HCP_j) \quad (18)$$

where:

$V_{PROD_j}^{TSO}$ - means the volume of natural gas introduced in the NTS by the TSO through the entry point 'j' from the production fields;

HCP_j - means the high calorific power of the entry point 'j' from the production fields.

- E_{IMP}^{TSO} - the energy of import natural gas introduced in the NTS by the TSO, through all entry points.

E_{IMP}^{TSO} does not contain the energy of natural gas which is the equivalent value of the transit service provide by the TSO, gas which is supplied to the customers of the TSO. This gas is in the import component of each network user that purchases natural gas from the TSO.

For a number $k = \overline{1, P_{IMP}}$ of import entry points, E_{IMP}^{TSO} is calculated by this formula:

$$E_{IMP}^{TSO} = \sum_{k=1}^{P_{IMP}} E_{PROD_k}^{TSO} = \sum_{k=1}^{P_{IMP}} (V_{IMP_k}^{TSO} \times HCP_k)$$



where:

$V_{IMP_k}^{TSO}$ - means the volume of import natural gas introduced in the NTS by the TSO through the entry point 'k';

HCP_k - means the high calorific power related to the import entry point 'k'.

- $E_{S.FACILITY}^{EXTR-TSO}$ - the energy of natural gas introduced in the NTS by the TSO, through all entry/exit points in the storage facilities which are in the extraction cycle.

The term has two components:

$$E_{S.FACILITY}^{EXTR-TSO} = E_{S.FACILITY}^{SOURCE_{EXTR.-TSO}} + E_{S.FACILITY}^{BALANCE_{EXTR.-TSO}} \quad (20)$$

where:

$E_{S.FACILITY}^{SOURCE_{EXTR.-TSO}}$ - the energy of natural gas introduced in the NTS as source by the TSO, through all the entry/exit points in the storage facilities which are in the extraction cycle;

For a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in the storage facilities, $E_{S.FACILITY}^{SOURCE_{EXTR.-TSO}}$ is calculated by this formula:

$$E_{S.FACILITY}^{SOURCE_{EXTR.-TSO}} = \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_l}^{SOURCE_{EXTR.-TSO}} = \sum_{l=1}^{P_{S.FACILITY}} (V_{S.FACILITY_l}^{SOURCE_{EXTR.-TSO}} \times HCP_l) \quad (20.1)$$

where:

$V_{S.FACILITY_l}^{SOURCE_{EXTR.-TSO}}$ - means the volume of natural gas introduced in the NTS as source by the TSO through the entry/exit point l in the storage facilities which are in the extraction cycle;

HCP_l - means the determined high calorific power related to the entry/exit point l in the storage facilities.

$E_{S.FACILITY}^{BALANCE_{EXTR.-TSO}}$ - the energy of natural gas introduced in the NTS for balancing by the TSO, through the all entry/exit points in the storage facilities which are in the extraction cycle;

For a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in the storage facilities, $E_{S.FACILITY}^{BALANCE_{EXTR.-TSO}}$ is calculated by this formula:

$$E_{S.FACILITY}^{BALANCE_{EXTR.-TSO}} = \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_l}^{BALANCE_{EXTR.-TSO}} = \sum_{l=1}^{P_{S.FACILITY}} (V_{S.FACILITY_l}^{BALANCE_{EXTR.-TSO}} \times HCP_l) \quad (20.2)$$



where:

$V_{S.FACILITY_i}^{BALANCE_{EXTR.}^{-TSO}}$ - means the volume of natural gas introduced in the NTS for balancing by the TSO through the entry/exit point i in the storage facilities which are in the extraction cycle;

HCP_i - means the determined high calorific power related to the entry/exit point i in the storage facilities.

- E_{RBC}^{TSO} - the residual balancing component of the NTS – is the algebraic sum but with changed sign of the unbalances caused by all network users, respectively the quantity of natural gas - expressed in energy units – which the TSO introduces in or takes out from the NTS in order to maintain its balance.

E_{RBC}^{TSO} is the actual result of the balancing equation for the TSO (17).

For a number $i = \overline{1, n}$ of network users, E_{RBC}^{TSO} is calculated by this formula:

$$E_{RBC}^{TSO} = \sum_{i=1}^n E_{IC}^{NU_i} \quad (21)$$

where: $E_{IC}^{NU_i}$ - means the unbalance component of the network user i ; this term was developed in the balancing equation for the network user i .

E_{RBC}^{TSO} may have as value:

- zero – meaning that all network users maintained the balance of their customer portfolio with results in maintaining the general balance of NTS; in this case the TSO does not need to carry out the residual balancing of the NTS;
- negative – meaning that there is a deficit of natural gas in the NTS, the TSO must compensate this deficit by introducing in the NTS the quantities resulted when applying the (21) formula;
- positive – meaning that there is a surplus of natural gas in the NTS, the TSO must remove this surplus by taking out from the NTS the quantities resulted when applying the (21) formula.



- E_{TCLd} - the energy of natural gas for the technological consumption localised-determined – this term was developed in the general balancing equation for the NTS.
- E_{TCNe} - the energy of natural gas for the technological consumption not localised-estimated – this term was developed in the general balancing equation for the NTS.
- $\Delta E_{STOR.inPIPE}$ - the energy variation of the natural gas stored in the component pipelines of the NTS – this term was developed in the general balancing equation for the NTS.
- $E_{S.FACILITY}^{SOURCE_{INJ}-TSO}$ - the energy of the natural gas taken out from the NTS as source by the TSO through all entry/exit points in the storage facilities which are in the injection cycle.

For a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in the storage facilities, $E_{S.FACILITY}^{SOURCE_{INJ}-TSO}$ is calculated by this formula:

$$E_{S.FACILITY}^{SOURCE_{INJ}-TSO} = \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_l}^{SOURCE_{INJ}-TSO} = \sum_{l=1}^{P_{S.FACILITY}} (V_{S.FACILITY_l}^{SOURCE_{INJ}-TSO} \times HCP_l) \quad (22)$$

where:

$V_{S.FACILITY_l}^{SOURCE_{INJ}-TSO}$ - means the volume of natural gas taken out from the NTS as source by the TSO through the entry/exit point l in the storage facilities which are in the injection cycle;

HCP_l - means the determined high calorific power related to the entry/exit point l in the storage facilities.

- $E_{S.FACILITY}^{BALANCE_{INJ}-TSO}$ - the energy of natural gas taken out from the NTS for balancing by the TSO through the entry/exit points in the storage facilities which are in the injection cycle.

For a number $l = \overline{1, P_{S.FACILITY}}$ of entry/exit points in the storage facilities, $E_{S.FACILITY}^{BALANCE_{INJ}-TSO}$ is calculated by this formula:

$$E_{S.FACILITY}^{BALANCE_{INJ}-TSO} = \sum_{l=1}^{P_{S.FACILITY}} E_{S.FACILITY_l}^{BALANCE_{INJ}-TSO} = \sum_{l=1}^{P_{S.FACILITY}} (V_{S.FACILITY_l}^{BALANCE_{INJ}-TSO} \times HCP_l) \quad (23)$$

where:



$V_{S.FACILITY_I}^{BALANCE_{INJ.}-TSO}$ - means the volume of natural gas taken out from the NTS for balancing by the TSO through the entry/exit point I in the storage facilities which are in the injection cycle;

HCP_I - means the determined high calorific power related to the entry/exit point I in the storage facilities.

Balancing Procedures

A. Daily

Article 91 (1) At the end of each n natural gas day, the TSO using the temporary allocations in the $n-1$ natural gas day calculates the daily unbalance for the $n-1$ natural gas day for each network user.

(2) By 02.00 P.M., in the n natural gas day, the latest, the TSO informs the network user about its temporary unbalance in the $n-1$ natural gas day.

(3) The daily temporary unbalance is only for information purposes.

(4) The economic operators specified in Article 2(1) take all necessary actions in order to be able to send the information requested in Paragraphs (1)-(3) for the weekend days and for the legal holidays.

B. Weekly

Article 92 (1) At the end of each natural gas week, the TSO calculates the temporary accumulated unbalance for each network user by summing up the daily temporary unbalances of the relevant natural gas week.

(2) By 04.00 P.M., in the first day of the n natural gas week, the latest, the TSO informs the network user about its temporary accumulated unbalance in the $n-1$ natural gas week.

(3) The temporary accumulated unbalance is only for information purposes.

(4) The economic operators specified in Article 2(1) take all necessary actions in order to be able to send the information requested in Paragraphs (1)-(3) for the weekend days and for the legal holidays.



B. Monthly

Article 93 (1) Within maximum 5 working days from the end of the month, the TSO informs the network user about its final accumulated unbalance in each whole natural gas week of the relevant month and about the final unbalance of each natural gas day of the relevant natural gas weeks.

(2) The final daily unbalance is calculated by the TSO using the balancing equations applied for each natural gas day based on the final allocations in the relevant natural gas day.

(3) The final accumulated unbalance is calculated for each natural gas week by summing up the daily final unbalances of each natural gas day of the relevant natural gas week.

(4) Within two (2) working days from the date when the network users receives the information sent by the TSO about their final accumulated unbalance, the network users may inform the TSO about the use of the *ex-post* gas transfer facility.

(5) Upon the receipt of the information sent by the network user on the use of the *ex-post* gas transfer facility, the TSO shall recalculate the final unbalance for each natural gas day and the final accumulated unbalance for each natural gas week, for each network user.

(6) The balancing procedures are specified in Table 3.

Daily Tolerance and Balancing Interval

Article 94 (1) The network users are responsible for ensuring the balance between the natural gas quantities supplied at the entry points in the NTS and the natural gas quantities taken over by their customers at the exit points from the NTS.

(2) If the daily tolerances provided in Table 1 are exceeded, the TSO charges daily unbalance tariffs, according to Article 109. The daily unbalance tariffs shall be charged for each natural gas day, based on the final allocation, even if the network user chooses to use the *ex-post* GTF or not.

(3) The network users shall be charged with the accumulated unbalance tariff, provided in Article 110, if they exceed the balancing interval provided in Table 2. The accumulated unbalance tariffs shall be charged for each natural gas week, based on the final allocations, after the network users had the chance to choose using the *ex-post* GTF or not.



Table 1 Daily Unbalance

Daily Unbalance
2.5% < Final daily unbalance ≤ 5% of the total nomination approved at the exit points
5% < Final daily unbalance ≤ 15% of the total nomination approved at the exit points
Final daily unbalance ≥ 15% of the total nomination approved at the exit points

Note: absolute values of the Final Daily Unbalance

Table 2 Accumulated Unbalance

Accumulated Unbalance
2.5% < Final accumulated unbalance < 5% of the total nomination approved at the exit points
5% < Final accumulated unbalance < 8% of the total nomination approved at the exit points
8% < Final accumulated unbalance < 12% of the total nomination approved at the exit points
12% < Final accumulated unbalance < 15% of the total nomination approved at the exit points
Final accumulated unbalance > 15% of the total nomination approved at the exit points

Table 3 Balancing Procedures

	Procedure	Response to the network users	Implications
Daily (end of natural gas day)	TSO calculates the daily temporary unbalance, based on the temporary allocations for the previous natural gas day	By 02.00 P.M., in the <i>n</i> natural gas day, the latest, the TSO informs the network user about its temporary unbalance for <i>n-1</i> natural gas day.	The temporary daily unbalance is only for information purposes.



<p>Weekly (end of natural gas week)</p>	<p>The TSO calculates the temporary accumulated unbalance, based on the temporary allocation for the previous natural gas week</p>	<p>By 04.00 P.M., in the first day of the n natural gas week, the latest, TSO informs the networks user about its temporary accumulated unbalance for $n-1$ natural gas week.</p>	<p>The temporary accumulated unbalance is only for information purposes.</p>
<p>Monthly (end of the calendar month)</p>	<p>The TSO calculates the final daily unbalance and the final accumulated unbalance, based on the final allocations for each whole natural gas week of the relevant month and for each natural gas day of the relevant weeks.</p>	<p>Within maximum 5 working days from the end of the month, TSO informs the network user about its final accumulated unbalance in each whole natural gas week of the relevant month and about the final unbalance of each natural gas day of the relevant natural gas weeks.</p>	<p>For each natural gas day when their daily unbalance exceeds the daily tolerance provided in Table 1, the network user shall be charged with the daily unbalance tariff provided in Table 6</p>
<p>In the following two working days</p>	<p>Possible use of GTF</p>	<p>Within two (2) working days from the receipt of the information from the</p>	<p>The TSO recalculates the final accumulated unbalance based on the final allocation for</p>



		TSO on the final accumulated unbalance.	each whole natural gas day of the relevant calendar month and for each natural gas day of the relevant natural gas day. The network users shall be charged with the accumulated unbalance tariff, provided in Table 7, for each natural gas week when their accumulated unbalance exceeds the balancing interval provided in Table 2.
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Emergency Supply Service

Article 95 The legal provisions on emergency situations shall apply.

Force Majeure

Article 96 The emergency supply service does not cover the cases of force majeure.

Article 97 The force majeure, the rights and responsibilities of the TSO and of the network users in case of force majeure are defined by the Romanian legislation in force.

Metering Natural Gas at the Entry/Exit Points in/from NTS



Article 98 (1) Natural gas metering shall be carried out in compliance with the effective regulations of CA.

(2) The gas metering systems at the entry/exit point in/from the NTS are operated in compliance with the provisions of the *Technical conditions for operating the natural gas metering points at the entry/exit in/from NTS*, provided in Annex 9.

(3) The complaints on natural gas metering are solved according to the regulations of CA and within the terms specified in the applicable performance standard in force.

Article 99 The minimum requirements on natural gas quality are provided in the technical regulations prepared by CA.

CHAPTER V – TRANSMISSION CONTRACTS MANAGEMENT

Article 100 Tariffs related to the NTS use shall be annually substantiated by the TSO and established by CA.

Article 101 (1) TSO shall permanently display on its own Internet page the tariffs related to NTS use.

(2) They shall be updated at least 30 days before the beginning of the period when the capacity is booked.

Tariff for Transmission in the NTS

Article 102 The Network User shall pay to the TSO an amount corresponding to the equivalent value of the transmission services, according to the contracting provisions.

~~*Tariff for informatics application installation necessary to develop the contracts and for occupational training in this view (HRT)*~~



~~Article 103 (1) TSO shall provide assistance for the installation of an informatics application compatible and for the related personnel occupational training, based on a tariff.~~

~~(2) The tariff shall not include the prices of the hardware and software necessary to the use of the informatics application³.~~

Tariff for the natural gas transfer facility

~~Art. 104(1) The network user shall pay to the TSO a tariff for each natural gas transfer accepted.~~

~~(2) The administration tariff of the GTF applies only to the ex-post GTF.⁴~~

Nomination Non-compliance Tariff

Article 105 For each gas day and for each NTS entry/exit point for which the allocation for the Network User differs from the nomination approved with a value higher than the limits of the range specified in Table 5, the Network User shall pay a Nomination Non-compliance Tariff.

Tariff for exceeding the booked capacity

Article 106 For each gas day and each NTS entry/exit point for which the Network User exceeds the maximum booked capacity with more than the limits of the range specified in Table 4, the Network User shall pay a tariff for exceeding the booked capacity.

Table 4 Tolerance limits for Booked Capacity Exceeding

Point	Tolerance limit (percentage of the booked capacity)
Import entry point	5%
Entry point from production fields	7%
Entry points from underground storage facilities	7%
Exit points	5%

³ Article 103 is abrogated.

⁴ Article 104 is abrogated.



Tariff for supply under approved nomination

Article 107 TSO shall pay to the Network User a tariff for supply under approved nomination, for the gas quantities non-compliant with the nomination according to the tolerance limits mentioned in Table 5.

Tariff for supply under booked capacity

Article 108 TSO shall pay to the Network User a tariff for the supply under *booked capacity*.

Table 5 Tolerance limits for the determination of the nomination tariff

Tolerance limits for the determination of the nomination tariff
3% < Difference between allocation and approved nomination ≤ 10% of the overall approved nomination at the entry/exit point
10% < Difference between the allocation and the approved nomination ≤ 20% of the overall approved nomination at the entry/exit point
Difference between allocation and approved nomination > 20% of the overall approved nomination at the entry/exit point

Note: absolute values

Table 5¹ Tolerance limits for the determination of the tariff for delivery under the approved nomination

Tolerance limits for the determination of the tariff for delivery under the approved nomination
3% < Difference between delivery and approved nomination ≤ 10% of the overall approved nomination at the exit points
10% < Difference between the delivery and the approved nomination ≤ 20% of the overall approved nomination at the exit points
Difference between delivery and approved nomination > 20% of the overall approved nomination at the exit points

Note: absolute values



Daily Unbalance Tariff

Article 109 For the periods of daily unbalance provided in Table 1, the Network Users shall pay a daily tariff. The daily unbalance tariff shall be charged for each gas day based on the final allocation, after the Network User opts or not for the use of ex-post GTF, according to the values in Table 6.

Table 6 – Daily Unbalance Tariff

Daily Unbalance (*)	Daily Unbalance Tariff
2.5% < final daily unbalance < 5% of the overall approved nomination at the exit points	A x daily final unbalance percentage exceeding the overall approved nomination at the exit points
5% < final daily unbalance < 15% of the overall approved nomination at the exit points	B x daily final unbalance percentage exceeding the overall approved nomination at the exit points
Daily final unbalance > 15% of the overall approved nomination to the exit points	C x daily final unbalance percentage exceeding the overall approved nomination at the exit points

(*) absolute values

The values of the indexers $A \div C$ shall be found in the Order of CA President regarding tariffs setting related to The Network Code.

Accumulated Unbalance Tariff

Article 110 (1) For the accumulated unbalance ranges provided in Table 2, the Network Users shall pay an Accumulated Unbalance Tariff. This tariff shall be applied for each gas week, based on the final allocation, after the Network Users had the opportunity to use the ex-post GTF, according to the values provided in Tables 7 and 8.

(2) The values from Table 7 shall include the equivalent value of the balancing gas quantities.



Table 7 – Accumulated Unbalance Tariff

Balancing Range (kWh)	Accumulated Unbalance Tariff (Lei/MWh)
2.5% < final accumulated unbalance < 5% of the overall approved nomination at the exit points	L x accumulated quantity exceeding the overall approved nomination at the exit points
5% < final accumulated unbalance < 8% of the overall approved nomination at the exit points	M x accumulated quantity exceeding the overall approved nomination at the exit points
8% < final accumulated unbalance < 12% of the overall approved nomination at the exit points	N x accumulated quantity exceeding the overall approved nomination at the exit points
12% < final accumulated unbalance < 15% final accumulated unbalance	O x accumulated quantity exceeding the overall approved nomination at the exit points
Final accumulated unbalance > 15% of the overall approved nomination to the exit points	P x accumulated quantity exceeding the overall approved nomination at the exit points

Table 8 – Accumulated Unbalance Tariff

Balancing Range	Accumulated Unbalance Tariff (Lei/MWh)
-2.5% < final accumulated unbalance < -5% of the overall approved nomination at the exit points	Q x accumulated quantity exceeding the overall approved nomination at the exit points
-5% < final accumulated unbalance < -8% of the overall approved nomination at the exit points	R x accumulated quantity exceeding the overall approved nomination at the exit points
-8% < final accumulated unbalance < -12% of the overall approved nomination at the exit points	S x accumulated quantity exceeding the overall approved nomination at the exit points
-12% < final accumulated unbalance < -15% final accumulated unbalance	T x accumulated quantity exceeding the overall approved nomination at the exit points
Final accumulated unbalance > -15% of the	U x accumulated quantity exceeding the overall



overall approved nomination to the exit points	approved nomination at the exit points
--	--

Values for indexes $L \div U$ shall be found in the Order of CA President regarding the setting of the tariffs related to The Network Code.

Invoicing and Payment

Article 111 (1) during the transmission contract management period, the TSO shall issue, in 10 (ten) working days from the end of the gas month, and shall communicate to the Network User, an invoice for the gas transmission services provided during the prior gas month.

(2) The invoice shall be drawn up based on the final allocation and shall include, as the case may be, the following:

- a) transmission tariff;
- ~~b) natural gas transfer management tariff;⁵~~
- c) tariff for exceeding the booked capacity;
- d) nomination non-compliance tariff;
- e) daily unbalance tariff;
- f) accumulated unbalance tariff;
- g) tariff for supply under nomination;
- h) tariff for supply under booked capacity.

(3) TSO shall be entitled to issue a pro forma invoice, taking into account the estimated value of the services provided in the relevant month to the Network User, until on the 15th of the current gas month, the latest.

~~(4) The scheme containing the invoicing procedures shall be found in Annex No 11⁶.~~

Invoice dispute

Article 112 (1) In case payment of the invoices is disputed, the procedure presented in this section shall be followed

⁵ Art. 111, par. (2) letter b is abrogated

⁶ Annex 11 'Invoicing Procedures' is abrogated



(2) In order to check the invoice, the Network User shall be entitled to access the data on which basis the invoice was drawn up, based on a notification for access addressed to the TSO.

(3) If following the analysis of these data errors are found in the invoice, this shall be immediately corrected and the related adjustments shall be made.

(4) All data from the invoices shall be kept for five (5) years. The disputed data or the misunderstandings presented in court shall be kept at least one year after the settlement of those disputes.

Payment

Article 113 (1) All payments made by the Network Users shall effected by bank transfer into the account specified by the TSO.

(2) All payments effected by the TSO shall be made by bank transfer into the account specified by the Network User.

(3) Each of the Parties may chose another bank if it notifies the other Party about their selection with at least 22 (twenty two) working days before the payment maturity.

(4) The payment shall be deemed as made if the amount is transferred until on the payment maturity date to the specified bank where it must arrived before 11.00 A.M. on the maturity date. All costs related to the bank transfer shall be paid by the Party making the relevant transfer.



Annex 1

(to The Network Code for the National Natural Gas Transmission System)

NATURAL GAS TRANSMISSION FRAMEWORK CONTRACT

No of (yy/mm/dd).....

S.C. TRANSGAZ S.A., headquartered
in(locality)...., ...(no)...St.,County/district,(postal code)...., phone no:.....,
fax:....., sole registration code, fiscal ID code....., registered with the Trade Register
under no....., with the account no....., opened with, duly
represented by, as natural gas transmission services provider, hereinafter called
'transmission system operator' or 'TSO', on one side

and

.....(fill in the identification data of the Network User), as User of the National
Transmission System (**NTS**) and beneficiary of the transmission services, hereinafter called
'Network User', on the other side,

each of them called individually **'Party'** and collectively **'Parties'**,

agreed upon the conclusion of this transmission contract, hereinafter called **'Contract'**.

I. Terminology and Governing Law

Article 1 (1) The terms used in this Contract are defined in the Gas Law No 351/2004, as further amended and completed, as well as in the Network Code, as approved by the Order of the ANRE President.

(2) The provisions of this Contract are completed by the provisions of the Commercial Code, Civil Code, Gas Law and ANRE regulations, including the provisions of The Network Code and the



provisions of the Technical Conditions for the operation of the natural gas quantity metering points at NTS entry or exit points, hereinafter called 'Technical Conditions'. All cases not explicitly set out in this Contract shall be governed by the provisions of The Network Code, which are integrally applicable to.

II. Scope of the contract

Article 2(1) The scope of this Contract shall be the supply of the firm/interruptible transmission services, meaning all the activities and operations performed by the Transmission System Operator or related to booking the transmission capacity at the entry and exit points in/from NTS as well as the transmission on NTS of the established natural gas quantities, expressed in energy units, according to The Network Code.

(2) The booked capacity at the entry and exit points to/from NTS shall be set out in Annex No 2 to this Contract, being expressed in kWh/day.

III. Contract Duration

Article 3 (1) The Contract hereby shall be concluded for one gas year or for more than one gas year, thus, for the interval starting with.....(day/month/year) and ending on(day/month/year).

(2) By way of derogation from the provisions of Paragraph (1), the Contract may be concluded also for a determined period ranging within the interval set out in Paragraph (1), according to the provisions of The Network Code.

IV. Metering Natural Gas at the NTS Entry or Exit Points

Article 4 Metering natural gas quantities shall be carried out continually, according to the provisions of the applicable law, the energy quantities entered into or exited from the NTS being determined according to the provisions of The Network Code.



V. Tariffs

Article 5 (1) The Network User shall pay to the TSO the equivalent value of the firm or interruptible natural gas transmission services provided, as calculated based on the transmission tariff (TT).

(2) The Network User shall pay in addition to the TSO, as the case may be, the tariffs provided for in The Network Code.

(3) The tariffs specified in Paragraphs (1) and (2) are set out in Annex 1 to the Contract hereby.

(4) The payment method and the banks agreed to operate the relevant banking transfer shall be established by mutual agreement, observing the law in force.

(5) The invoices issued according to the provisions of The Network Code shall be paid in term of 15 calendar days from the invoice issue date. In case the maturity date is a not working day, the term shall be deemed as reached on the working day next to the relevant non-working day.

(6) The payment obligation shall be considered as fulfilled on the date of the entry of the relevant overall amounts into the account of the TSO.

(7) The monthly invoicing of the value of the interruptible natural gas transmission services provided is performed based on the capacity booked in the NTS, on the number of hours every month the transmission services were not limited/interrupted and on the natural gas quantities delivered/taken over by the TSO, as well as, as appropriate, on the other payment obligations deriving from the performance of the contract hereby.

VI. Rights and Obligations of the TSO

Article 6 The TSO shall have the following rights:

- a) to collect the equivalent value of the services provided;
- b) to limit or interrupt the supply of transmission services by sending a notice of its intention, in advance, in case of non-fulfilment of the payment obligations according to the terms and conditions set out in this Contract;



- c) to suspend the supply of the transmission services, in case the NU does not observe the provisions of The Network Code;
- d) to refuse the takeover on the NTS of the natural gas not compliant with the minimum quality requirements set out in the Technical Conditions;
- e) in case of emergency supply, to assure the interruption of the interruptible customers, if the NU does not take this measure;
- f) to invoice to the NU the equivalent value of the natural gas transmission services provided, observing the tariffs set out in this Contract;
- g) to limit or to interrupt the supply of the natural gas transmission services in order to remedy the failures appeared in the NTS, informing the network user about such measure in maximum 6 hours;
- h) to limit or to interrupt the supply of the natural gas transmission services in case the overall daily takeover of energy records a variation bigger than or equal with 15% of the nomination, for 2 consecutive gas days;
- i) to answer and solve the claims of the network user concerning the supply of transmission services, according to the legislation in force;
- j) all the other rights, as they are provided for by The Network Code.

Article 7 The TSO shall have the following obligations:

- a) to notify the network user with regard to possible limitations/interruptions of the transmission services supply, in case the payment obligations are not fulfilled;
- b) to resume the transmission services supply within 24 hours from the date the payment obligations are fulfilled;
- c) to take over, to transmit and supply, to the network user, the energy quantities, provided that the pressure levels comply with those established in the contract, and according to the approved nominations/re-nominations;
- d) to supply the natural gas at the exit point from the NTS, complying with the natural gas quality requirements provided for by the Technical Conditions;



- e) to initiate the modification and/or completion of this contract, in case the circumstances, under which the contract was concluded, change;
- f) all the other obligations, as provided for by The Network Code.

VII. – The Rights and Obligations of the Network User

Article 8 The network user shall have the following rights:

- a) to, voluntarily, return or transfer the approved capacity, according to The Network Code provisions;
- b) to transfer the natural gas quantities, according to The Network Code provisions;
- c) to request and receive, from the TSO, the amounts related to non insuring the booked capacity and, respectively, to the supply below the approved nomination/re-nomination, according to The Network Code provisions;
- d) to refuse to take over, from NTS exit points, the natural gas non-compliant with the quality requirements established in the Technical Conditions;
- e) to request the TSO to modify this contract, if the circumstances, under which the contract was concluded, change;
- f) all the other rights, as provided for by The Network Code.

Article 9 The network user shall have the following obligations:

- a) to pay, fully and on term, the invoices issued by the TSO, representing the equivalent of the supplied transmission services;
- b) to accept the temporary reduction of the capacity and nomination/re-nomination, approved at the entry points, if the quality requirements regarding the natural gas and/or pressure, established in Annex 3 to this contract, are not complied with;
- c) to notify the TSO, through the nomination/re-nomination, with regard to the appointed partner and to its related energy quantities;



- d) through its suppliers and system operators, to take all the necessary measures for the purpose of ensuring the limitations/interruptions of energy supply for its customers, including interruptible customers, according to the legislation in force;
- e) to supply the natural gas at NTS entry points, according to the natural gas quality requirements provided for by the Technical Conditions;
- f) all the other obligations, as provided for by The Network Code.

VIII. – Guarantees

Article 10(1) The guarantees established for the fulfilment of the contractual obligations are provided for by The Network Code.

(2) In addition to the provisions of paragraph (1), the parties may present to each other, one or several guarantee instruments for the obligations established in the contract.

(3) The guarantee instruments, provided for by Paragraph (2), shall be established under equivalence conditions.

IX. –Transmission Schedule

Article 11 (1) The transmission schedule is provided for by Annex no. 3 to the contract hereby.

(2) The transmission schedule may be modified according to the procedure provided for by The Network Code.

(3) The parties must observe the maximum/minimum pressure at the entry/exit points, as it is provided for by this contract.

(4) TSO may allow an excess of pressure at the entry points, if operating under such conditions does not affect the transmission for other users of the network.

X. – Confidentiality Clause



Article 12(1) Parties shall keep the confidentiality of the data, documents and information obtained during the development of the contracts.

(2) The following data, documents and information shall be exempted from the provisions of paragraph (1):

- data, documents, information allowed to be disclosed according to the provisions of The Network Code;
- data, documents and information of which disclosure has been approved in writing by the other Party;
- data, documents and information requested by the competent State bodies based on the legal public information obligation.

(3) The provisions of this article shall remain in force for five years starting with the date the contractual relations cease.

XI. Contractual Liability

Article 13(1) Non-fulfilment of the obligation to pay the invoices as set out in Article 5(5) shall lead to:

- a) collection of the delay penalty calculated by applying the penalty rate, equal with the delay increments owed for not paying the obligations to the State budget on time, to the amount not paid for each delay day, starting with the 16th calendar day from the date of the invoice issue date, until on the date of the payment of the entire amount invoiced, including the payment day, if the obligation is not paid in 15 calendar days from the maturity date;
- b) limitation of the supply of the natural gas transmission service starting with the 26th day from the invoice issue date, with a warning notice of 5 calendar days, if the obligation is not paid;
- c) interruption in the supply of the natural gas transmission service, with a warning notice of 3 calendar days, starting with the day next to the 15-calendar days term expiry date set out in letter a), if the obligation is not paid.



(2) If the maturity date or the day next to the grace period expiry date is a not working day, the terms set out in paragraph (1) shall be correspondingly shifted.

Article 14 (1) In case the network user does not assure, during the natural gas supply month, the natural gas quality conditions at least according to the standard set out in the Technical Conditions, at NTS entry points, the TSO shall be entitled to request and receive an amount equal with 0.5% of the equivalent value of the natural gas, expressed in energy units, transferred at NTS entry point under the quality provided in the Technical Conditions, calculated by multiplying the natural gas quantities expressed in energy units as recorded in the minutes concluded upon entry in the NTS during the period when they did not observe the necessary quality standard with the fixed unit cost amounts for the natural gas purchases expressed in RON/Energy Units as valued by ANRE during the relevant period.

(2) If the amount set out in paragraph (1) does not cover the entire damage caused, the TSO shall be entitled to request and receive supplementary compensations until the entire amount of the damage suffered because of the non-fulfilment by the NU of its obligations by its fault, as well as of other obligations set out in the contract hereby, shall be covered;

Article 15 If the NU does not assign voluntary/does not use the booked capacity transfer facility not used, upon TSO request, performing a compulsory capacity transfer, NU shall pay 5% of the transferred capacity for the period between the compulsory capacity transfer date and the contract termination date.

Article 16 (1) The NU shall be entitled to request and receive:

- a) an amount determined according to the supply tariff under nomination, according to the provisions of The Network Code, in case of supply in the exit points of the NTS under the approved nomination/re-nomination.



- b) an amount determined according to the supply tariff under booked capacity, according to the provisions of The Network Code, in case TSO does not keep the entire transmission capacity booked for a NU available for the relevant NU;
- c) an amount equal with 0.5% of the equivalent value of the natural gas, expressed in energy units, transferred at the exit from the NTS under the quality standard set out in the Technical Conditions, calculated by multiplying the natural gas quantities under the requested quality, expressed in energy unit, as recorded in the minutes concluded for the period of supplying natural gas under the established quality, at NTS exit, with the fixed unit costs covering the purchase of natural gas, expressed in RON/Energy Units, as valued by ANRE for the same period;

(2) If the amount set out in paragraph (1) does not cover the entire damage caused, the NU shall be entitled to request and receive supplementary compensations until the entire amount of the damage suffered because of the non-fulfilment by TSO of its obligations by its guilt, as well as of other obligations set out in this contract, shall be covered.

XII. – Force Majeure

Article 17 (1) The Force Majeure is the future unpredictable and beyond control event that can lead to the exoneration of each guilty Party of its contractual liability.

(2) The Party invoking the Force Majeure event shall notify the other Party, in 48 hours from the occurrence of the event, about the relevant event and shall send to the other Party, in 10 calendar days subsequent to the event cessation date, the related supporting documents. Also, the Party envisaged shall undertake any reasonable measure to limit the effects of such an event.

(3) The Force Majeure events shall be certified by the Romanian Chamber of Commerce and Industry.

(4) If the Force Majeure event does not cease in 30 calendar days from its occurrence, the Parties shall be entitled to rightfully request the contract termination, without being entitled to claim any indemnities.



XIII. – Contract Termination

Article 18 (1) This contract shall terminate:

- a) upon the expiry of the Contract Term validity;
- b) following the Parties' agreement;
- c) in case one of the obligations concerning the transmission in NTS access services set out in The Network Code is not fulfilled;
- d) in case of voluntary return of the overall capacity, approved according to The Network Code;
- e) in case of compulsory transfer of the overall capacity approved under the conditions and terms of The Network Code;
- f) by unilateral denunciation, if the NU/TSO does not fulfil its obligation to pay the services provided, respectively, its obligation to provide the services assumed by contract;
- g) by denunciation, in case of bankruptcy, winding up, liquidation or licence withdrawal proceedings, as the case may be, are initiated by the contracting partner;
- h) following the occurrence of a Force Majeure event, according to the contract.

(2) This contract termination shall have no effect on the contracting obligations deriving from the execution of the contract, until on its termination.

XIV – Notifications

Article 19 (1) The parties shall notify each-other of any change in the circumstances taken into consideration at the conclusion of this Contract, during the development period of this contract, at the correspondence office set in the Preamble to this Contract.

(2) The Notification Term shall be of maximum 5 calendar days from the date of the occurrence of the relevant circumstance change, unless otherwise expressly specified in the Contract.

(3) The notice dispatch shall be set by mutual agreement, observing meanwhile the provisions of The Network Code.

XV. – Governing Law and Litigation Settlement



Article 20 (1) The provisions of this Contract shall be governed by and construed according to the Romanian law in force.

(2) The Parties agree to settle any disputes concerning the validity, interpretation, execution and termination of this Contract in friendly manner. If such a settlement is not possible, the litigations shall be settled by the competent judicial bodies.

XVI. – Contract Assignment

Article 21 (1) None of the Parties shall assign, all or part of this Contract and its contracting rights and obligations, to a third party, without the prior written approval of the other Party, which must not be unreasonably refused.

(2) Contract assignment shall be notified to the other Party in maximum 10 working days before the date of the intended assignment.

(3) The notified Party shall answer to the notice received, in a grounded manner, in term of maximum 5 working days from the notice registration date.

(4) If the notified Party does not answer or does not offer its grounds of the relevant answer, as the case may be, in the term set out in Paragraph (3), the assignment intention shall be deemed as accepted.

XVII. – Miscellaneous

Article 22 This Contract may be amended or completed following the Parties' agreement, under the applicable law in force.

Article 23 The following Annexes are integral part of this Contract:

- Annex 1: Tariffs
- Annex 2: Booked Capacity;
- Annex 3: Transmission Schedule

Concluded today, the date of....., in two original counterparts with equal legal power of the original counterpart each of them, each Party stating having received such a copy.



Note: The clauses of the Contract hereby, applicable to the interruptible customers of natural gas shall be undertaken exclusively in the contracts concluded between the TSO and the NUs having in their customer portfolios the interruptible customers.

Transmission System Operator

Legal Representative,

Network User

Legal Representative,

Annex 1

to the Natural Gas Transmission Framework Contract

TARIFFS

Annex 2

to the Natural Gas Transmission Framework Contract

BOOKED CAPACITY*

NOTE:

***the Form in Annex 4 to The Network Code shall be used**

Annex 3

to the Natural Gas Transmission Framework Contract

TRANSMISSION SCHEDULE*

NOTE:

- the Form in Annex 5 to The Network Code shall be used**



ANNEX 2

to The Network Code for the National Natural Gas Transmission System

Network User's Statement

According to the provisions of The Network Code, I declare hereby that the application for capacity booking for each of the entries in the NTS is compliant with:

- a) the contracts concluded with the customers from its own customer portfolio;
- b) the gas storage contracts;
- c) its own necessary consumption.

Network User,
Legal Representative

Date:
Signature:



ANNEX 3

to The Network Code for the National Natural Gas Transmission System

Application for Capacity Booking

I. Applicant:

Network User: [Network User name and identification data];

Contact for the relevant Application:

II. Capacity Booking Period

The capacity is requested for the period of:

1. [natural gas day]; [month]; [year], 6.00 A.M. – [natural gas day]; [month]; [year], 6.00 A.M.

III. Capacity Information

The capacity is requested for the following NTS entry(s)/exit(s):

Entry Point

No	VMP Code*	VMP Name*	MP Code**	MP Name**	NU Partner (producer/ importer/ supplier/ storage facility operator (SFO)	Parameters			
						Capacity			Minimum pressure (Bar)
						Thousand m ³ /day	MWh/day	PCS	
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]

*Virtual Entry Point

**Physical Entry Point

Exit Point



No	VSM Code*	VSM Name*	RMS Code**	RMS Name**	NU Partner (DSO/ customer/ SFO)	Parameters			
						Capacity			Minimum pressure (Bar)
						Thousand m ³ /day	MWh/day	PCS	
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]

*Virtual Exit Point

**Physical Exit Point

The High Calorific Power taken into consideration to convert the capacity in MWh/day shall be determined as an average weighed by the natural gas volumes of high calorific powers measured, during the previous calendar year, for each of the points considered.

Of the capacity requested at the exit points, the following shall be for the interruptible emergency supply:

No	VSM Code*	VSM Name*	RMS Code**	RMS Name**	NU Partner (DSO/ customer/ SFO)	Parameters			
						Capacity			Minimum pressure (Bar)
						Thousand m ³ /day	MWh/day	PCS	
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]

*Virtual Exit Point

**Physical Exit Point

IV. Supplementary Information

For the capacity at the entry points:

1. NU Partner/Customers shall be specified.
2. Statements according to the Form of Annex 2 to The Network Code shall be attached.

Network Use

Date:



SOCIETATEA NAȚIONALĂ DE TRANSPORT
GAZE NATURALE "TRANSGAZ" SA MEDIAȘ
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ORC: J32/301/2000; C.I.F.: RO13068733
P-ța C. I. Motaș nr. 1, cod: 551130, Mediaș, Jud. Sibiu
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The Network Code Of The National Gas
Transmission System - updated on 28
December 2011
(This version shall enter into force as of 1 April
2012.)

Legal Representative

Signature:



ANNEX 4

to The Network Code for the National Natural Gas Transmission System

NOTICE

of approval/ of refusal

Following your Application No, registered under No.....

- Hereby we inform you about the approval of the following capacity booking:
- Based on Article 43, Paragraph (2) of The Network Code, hereby we inform you the refusal related to the following capacity booking:

No	VMP Code*	VMP Name*	MP Code**	MP Name**	NU Partner (producer/ importer/ supplier/ storage facility operator (SFO)	Parameters			
						Capacity			Minimum pressure (Bar)
						Thousand m ³ /day	MWh/day	PCS	
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]

*Virtual Entry Point

**Physical Entry Point

Exit Point

No	VSM	VSM	RMS	RMS	NU	Parameters
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	Code*	Name*	Code**	Name**	Partner (DSO/ customer/ SFO)	Capacity			Minimum pressure (Bar)
						Thousand m ³ /day	MWh/day	PCS	
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]

*Virtual Exit Point

**Physical Exit Point

TSO

Legal Representative

Date:

Signature:



ANNEX 5

to The Network Code for the National Natural Gas Transmission System

TRANSMISSION SCHEDULE

We would like to inform you hereby about our Annual Transmission Schedule according to the provisions of The Network Code,. To this purpose, we communicate you, in the table below, the monthly quantities subject of the Natural Gas Transmission Contract agreed with the producers, suppliers, storage facility operators, DSO, for the period of.....:

Entry Point

No	VMP Code *	VMP Name*	MP Code **	MP Name**	NU Partner (producer/ importer / supplier/ storage	Quantity (MWh)											
						July	Aug ust	Septe mber	Octo ber	Novem ber	Dece mber	Jan uar y	Febr uary	Mar ch	Apri l	May	Ju ne



					facility operator (SFO)												
1	[code]	[name]	[code]	[name]	[name]	[val ue]	[val ue]	[value]	[valu e]	[value]	[valu e]	[val ue]	[valu e]	[val ue]	valu e	valu e	val ue

*Virtual Entry Point

**Physical Entry Point

Exit Point

No	VSM Code *	VSM Name	RMS Code **	RMS Name**	NU Partner (DSO/ customer / SFO)	Quantity (MWh)											
						July	Aug ust	Septe mber	Octo ber	Novem ber	Dece mber	Jan uar y	Febr uary	Mar ch	Apri l	May	Jun e
1	[code]	[name]	[code]	[name]	[name]	[val]	[val]	[value]	[valu]	[value]	[valu]	[val]	[valu]	[val]	[val]	[val]	[val]



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]]			ue]	ue]	out of	e]	out of	e]	ue]	e]	ue]	ue]	ue]	ue]
						out	out	which:	out of	which:	out of	out	out of	out	out	out	out
						of	of		which		which	of	which	of	of	of	of
						whi	whi	:	:	:	whi	:	whi	whi	whi	whi	whi
						ch:	ch:				ch:		ch:	ch:	ch:	ch:	ch:

*Virtual Exit Point

**Physical Exit Point

The High Calorific Power taken into consideration to convert the capacity in MWh/day shall be determined as an average weighted by the natural gas volumes of high calorific powers measured, during the previous calendar year, for each of the points considered.

Please note that this Transmission Schedule is compulsory for the gas year [], unless otherwise amended by us, in writing, according to the terms and conditions of The Network Code.

Network User

Date:

Legal Representative

Signature:



ANNEX 6

to The Network Code for the National Natural Gas Transmission System

NOTICE ON THE CHANGE OF THE TRANSMISSION SCHEDULE NO..... OF

We inform you hereby about our change in the Annual Transmission Schedule, according to the provisions of The Network Code. To this purpose, we communicate you, in the table below, the new quantities taken into consideration:

Entry Point

No	VMP Code *	VMP Name*	MP Code **	MP Name**	NU Partner (producer/ importer / supplier/ SFO)	Quantity (MWh)							
						July	August	September	October	November	December	January	February
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]	[value]	[value]	[value]	[value]

*Virtual Entry Point

**Physical Entry Point

No	VSM Code *	VSM Name*	RMS Code **	RMS Name**	NU Partner (DSO/ customer/ SFO)	Quantity (MWh)							
						July	August	September	October	November	December	January	February



1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]	[value]	[value]	[value]	[value]
						out of which:	out of which:	out of which:	out of which:	out of which:	out of which:	out of which:	out of which:

*Virtual Exit Point

**Physical Exit Point

Network User

Date:

Legal Representative

Signature:



ANNEX 7

to The Network Code

for the National Natural Gas Transmission System

NOMINATION/RE-NOMINATION

The undersigned [*name and identification data of NU*], Party to the Transmission Contract No [] concluded between [*NU name*] and [*TSO name*] of [*date of conclusion*]

According to the provisions of The Network Code, we inform you hereby about our following nomination/re-nomination for the [] gas week/day:

No	VMP Code*	VMP Name*	MP Code*	MP Name**	NU Partner (producer / importer/ supplier/ SFO)	Quantity (MWh)						
						WEDNESD AY dd/mm/yy	THURSD AY dd/mm/yy	FRIDA Y dd/mm /yy	SATURD AY dd/mm/yy	SUNDAY dd/mm/yy	Monday dd/mm/yy	Tuesda y dd/mm/ yy
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]	[value]	[value]	[value]

* - Virtual Entry Point

** - Physical Entry Point

No	VSM Code*	VSM Name*	RMS Code**	RMS Name**	NU Partner (DSO/ custome r/ SFO)	Quantity (MWh)					
						WEDNE SDAY dd/mm/yy	THURSD AY dd/mm/yy	FRIDAY dd/mm/y y	SATURD AY dd/mm/yy	SUNDAY dd/mm/yy	MONDA Y dd/mm/yy



1	[code]	[name]	[code]	[name]	[name]	[value] out of which % domestic consum ption	[value] out of which % domestic consump tion	[value] out of which % domestic consump tion	[value] out of which % domestic consump tion	[value] out of which % domestic consump tion	[value] out of which % domestic consumpt ion
---	------------	--------	------------	--------	--------	---	---	---	---	---	---

*Virtual Exit Point

**Physical Exit Point

The High Calorific Power taken into consideration to prepare the nomination/re-nomination are those available on the TSO Internet page on the date of preparation of the relevant application, as calculated and published according to the provisions of the Measuring Regulation for the natural gas quantities traded in Romania.

We certify hereby that this is the only nomination/re-nomination for the gas week/day [*] and we reserve meanwhile the right to make re-nomination according to the provisions of The Network Code.

We certify hereby that this is the only re-nomination for the gas week/day [*].

We state hereby that the nomination/re-nomination is compliant with the contractual obligations, according to its own customers portfolio.

We are waiting for your approval for the above mentioned quantities.

Network User

Date:

Legal Representative

Signature:

ANNEX 8

To The Network Code for the National Natural Gas Transmission System

Capacity Transfer Application

The undersigned, [name and identification data of the Network User], Party to the Transmission Contract No [] of [fill in the conclusion date], concluded between [TSO name] and [NU name], as Network User transferring natural gas, and

The undersigned, [name and identification data of the Network User], Party to the Transmission Contract No [] of [fill in the conclusion date], concluded between [TSO name] and [NU name], as Network User benefiting of the natural gas transfer,

We request hereby the transfer from the transferring Network User to the transfer beneficiary Network User, starting with the date of [fill in the date], of the following capacity:

Entry Point

No	VMP Code *	VMP Name *	MP Code* *	MP Name* *	NU Partner (producer/ importer/ supplier/ SFO)	Parameters			
						Capacity			Minimu m pressur e (Bar)
						Thousan d m ³ /day	MWh/ day	PCS	
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]

*Virtual Entry Point

**Physical Entry Point

Exit Point

No	VSM Code	VSM Name	RMS Code* *	RMS Name* *	NU Partner	Parameters	
						Capacity	Minimu

	*	*	*	*	(DSO/ customer / SFO)	Thousan d m ³ /day	MWh/da y	PCS	m pressur e (Bar)
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]

*Virtual Exit Point

**Physical Exit Point

Of which, the following is interruptible emergency supply capacity:

No	VSM Code *	VSM Name *	RMS Code*	RMS Name*	NU Partner (DSO/ customer / SFO)	Parameters			
						Capacity			Minimu m pressur e (Bar)
						Thousan d m ³ /day	MWh/da y	PCS	
1	[code]	[name]	[code]	[name]	[name]	[value]	[value]	[value]	[value]

*Virtual Exit Point

**Physical Exit Point

Taking into consideration the above mentioned, please note that the booked capacity of the transferring Network User, which transfers according to The Network Code is of [], following the Approval No [] given by TSO attached as Annex 1 to this document, shall be correspondingly changed.

This Capacity Transfer Application is grounded on the following argument: *[hereinafter arguments are filled in]*.

Transferring Network User

Date:



SOCIETATEA NAȚIONALĂ DE TRANSPORT
GAZE NATURALE "TRANSGAZ" SA MEDIAȘ
Capital social: 117 738 440,00 LEI
ORC: J32/301/2000; C.I.F.: RO13068733
P-ta C. I. Motaș nr. 1, cod: 551130, Mediaș, Jud. Sibiu
Tel.: 0040 269 803333, 803334; Fax: 0040 269 839029
<http://www.transgaz.ro>; E-mail: cabinet@transgaz.ro



The Network Code Of The National Gas
Transmission System - updated on 28
December 2011
(This version shall enter into force as of 1 April
2012.)

Authorized Representative

Signature:

Transfer Beneficiary Network User

Date:

Authorized Representative

Signature:

ANNEX 9

(to The Network Code for the National Natural Gas Transmission System)

TECHNICAL CONDITIONS

FOR OPERATING THE NATURAL GAS METERING POINTS AT THE ENTRY/EXIT IN/FROM THE NTS

Chapter 1 General Conditions

- 1.1. *The Technical conditions for operating the natural gas metering points at the entry/exit in from the NTS, hereinafter called **Technical Conditions**, are integrant part of The Network Code and establish:*
 - a) the rights and obligations of the TSO, NU and NU Partners concerning the operation of the NTS entry/exit points;
 - b) the data exchange between the TSO, NU and NU Partners, data necessary for the safe and efficient operation and use of the NTS;
 - c) the metering methods and equipment (meters/metering systems) for metering the natural gas quantities traded;
 - d) the calculation formulas used to determine the natural gas quantities;
 - e) the methods and equipment necessary to determine the quality parameters for the natural gas.
- 1.2. The **Technical Conditions** shall apply in the relations between the TSO and the NU or NU Partners, being integral part of the Natural Gas Transmission Contract No....of.....
- 1.3. The terms used in these **Technical Conditions** are those defined in the Natural Gas Law No 351/2004, as further amended and completed, and in The Network Code.

Chapter 2 Operation of NTS entry/exit points

- 2.1. NTS entry/exit points belonging to the TSO shall be operated by the TSO with the observance of the working procedures prepared according to the *Quality*



Assurance Handbook and the applicable laws in force, consisting mainly of the following activities:

- a) Operation and maintenance of the entire technological facility and related equipment by a qualified and authorized personnel able to assure the safe, secure and continuous operation of the supply of the relevant facility and related equipment;
- b) Operation of the technological facility in a manner able to ensure the observation of the pressure, flow and odorization parameters;
- c) Metering and determination of the natural gas quantities at NTS entry/exit points by using the metering systems;
- d) Adjustment of the structure and configuration of the metering system to the natural gas pressure and flow requirements, as set out in the provisions of the Transmission Contract regarding the approved capacity;
- e) Regular metrological review of the metering systems according to the provisions of the applicable laws in force and the specifications from Chapter 4 of these **Technical Conditions**;
- f) Keeping and updating the Technical Book of the technological facility from NTS entry/exit point, which must contain at least the following:

- (1) general description of the technological facility, specifying its technical features and the commissioning year;
- (2) the technological scheme of the technological facility;
- (3) the geometrical configuration of the metering board, specifying the related dimensions;
- (4) description of the metering system used, specifying the technical and metrological characteristics of all its elements;
- (5) delimitation of the operation areas, pointing out the areas classified as being hazardous areas;
- (6) documents attesting the metering system conformity with the requirements of the metrological laws in force;

- g) Assuring the safety of the measurements by:



- (1) sealing the metering systems according to the sealing scheme from the model approval;
 - (2) leak proof insulation of the spare metering lines, if any, by closing and sealing the valves;
 - (3) observance of the operation conditions set out in the Technical Book of the facility and metering systems, by sealing all valves in the full 'closed' or 'opened' position, as the case may be;
 - (4) protection of the data recorded by the flow computers by using software passwords;
 - (5) protection and sealing all the subassemblies of the devices and measuring heads which may be out of order during the operation, affecting adversely in this manner the result of the natural gas metering;
- h) Ensuring the guard, integrity and security of the technological facility at the NTS entry/exit point;
 - i) Ensuring the application of the work safety and health protection measures, emergency intervention measures and environmental protection measures compliant with the applicable laws in force;
 - j) Keeping the integrity of the Calibration Log Book and filling in this Log Book according to the principle 'As found - as left';
 - k) Keeping the integrity and filling in the *Configuration Log Book* and the *Damage Log Book*.
- 2.2. TSO and NU rights and obligations shall be those established in the Natural Gas Transmission Contract and in The Network Code.
- 2.3. To perform the natural gas transmission contracts, the NU shall be liable to provide in the contracts concluded with its partners, obligations concerning the operation of the metering points designated to the natural gas quantities and the data exchange between partners;
- 2.4. To operate the natural gas quantity metering points at the entry in NTS, TSO, NU and NU Partners shall have the following special obligations:



- A.** NU Partners (producers, importers, storage facility operators) shall have the following obligations in their relation with the TSO:
- (1) To allow the access of the representatives appointed by the TSO within the technological facility to control the metering systems and to carry out metrological reviews of their elements, upon the written request of TSO and in the presence of the NU and/or its Partners;
 - (2) To inform the TSO about the planned change of the technological regimes of natural gas supply with at least 24 hours before;
 - (3) To communicate, as soon as possible, to the TSO, the appearance of damages affecting adversely NTS technological regime, as well as the measures taken to remedy the relevant damages;
- B.** The TSO shall have the following obligations to the NU and to NU Partners:
- (1) To inform the NU and NU Partners (producers, importers, storage facility operators), with at least 24 hours in advance, about the change in the technological regime of the natural gas taken over in view of their transmission;
 - (2) To communicate, as soon as possible, to the producer, importer, storage facility operator, as the case may be, the appearance of special NTS operation events able to affect adversely the technological regime, as well as the measures taken to remedy the relevant special events;
 - (3) To allow the access of the NU and/or NU Partners within the technological facility to control the metering systems and to carry out the metrological reviews of their elements, upon NU or NU Partners' written request and in the presence of TSO Representatives;
 - (4) To mount one-way flush valves downstream to the metering systems anytime a bi directional flow of natural gas is possible, that may affect the metering.

- 2.5. To operate the metering points for the natural gas quantities at the exit from the NTS, the TSO, the NU and NU Partners shall have the following special obligations:
- A. TSO shall have the following obligations to NU and NU Partners (DSO, SFO, customers directly branched to NTS):
 - (1) To allow the access of the representatives appointed by the NU and/or NU Partners within the technological facility to control the metering systems and to carry out metrological reviews of their elements, upon the written request of the NU or NU Partners and in the presence of TSO Representatives;
 - (2) To inform the NU and its Partners about the planned change of the technological regimes of natural gas supply, with at least 24 hours before;
 - (3) To communicate, as soon as possible, to the NU and to its Partners, the appearance of damages affecting adversely the NTS technological regime, as well as the measures taken to remedy the relevant damages;
 - B. The NU and its Partners shall have the following obligations to the TSO: to communicate, as soon as possible, to TSO, the appearance of special events in the operation of the auxiliary systems connected to NTS, able to affect adversely NTS technological regime, as well as the measures taken to remedy the relevant special events.
- 2.6. The technical equipment of the entry/exit points in the NTS shall be assured by the owner/operator of the relevant point, on its charge, being observed the conditions set out in the [Metering Regulation for the natural gas quantities traded in Romania](#) and in Chapter 3 of these **Technical Conditions**.
- 2.7. NTS exit points shall be operated only by the TSO, regardless of the owners of the relevant points, according to the natural gas transmission licence and related operation authorization.

Chapter 3 Metering and determination of the natural gas quantities

- 3.1. (1)** Natural gas quantities shall be commercially metered by the owner/operator of NTS entry/exit points by using the metering systems hereinafter called basic metering systems.
- (2) The basic metering systems used shall observe the conditions specified in the [Metering Regulation for the natural gas quantities traded in Romania](#).
- 3.2. (1)** The owner/operator of the basic metering systems shall accept, upon the request of the other party, the mounting, by the latter, of its own metering systems hereinafter called control systems, having the accuracy class similar with that of the basic metering systems, if mounted in a manner preventing the interference between the control systems and the basic metering systems.
- (2) The control systems shall be mounted according to the provisions of the [Metering Regulation for the natural gas quantities traded in Romania](#).
- (3) Metering by using the control systems shall not be opposable to metering by using basic metering systems.
- 3.3.** The data, on which basis the natural gas quantities entering into/exiting NTS, shall be collected for all the supply/takeover entry points and exit points and for all the metering systems, at 6.00 A.M. of the natural gas day.
- 3.4. (1)** The quantities determined by the basic metering systems shall be recorded in the Minutes according to the forms presented in Annexes from 2.1 to 2.7 and shall be communicated daily to the Parties (TSO, respectively, NU and NU Partners).
- (2) At NTS entry/exit points where there are no control systems, the basic metering system operator shall give to the other party, upon its request, the data and/or diagrams recorded until the moment of the conclusion of the Weekly Natural Gas Transfer/Takeover Minutes maximum, as presented in the Annexes 2.1 – 2.6.
- 3.5.** If the Parties do not agree upon the values obtained due to objective and supported reasons, the metering systems shall be reviewed according to the Chapter 4 of these **Technical Conditions**.



- 3.6.(1) The owner/operator of the metering systems from the entry points in the NTS shall compare daily the quantities measured by the basic metering systems with those measured by the control systems (where there are such systems).
- (2) Temporary, if there are differences between the quantities measured by the basic metering systems and those measured by the control systems, parties shall agree to report the quantity indicated by the basic metering system.
- (3) After the determination of the causes generating the difference, if error is due to the basic metering system, the value reported according to the paragraph (2) shall be corrected based on amiable understanding between the parties, in 3 working days. The corrections brought in such a case shall be applied starting with the date of difference recording.
- (4) If the moment of the appearance of the difference can not be determined or if parties do not agree upon the correction, this correction shall be made for a period equal with half of the period elapsed from the date of the last review, which must not exceed 30 days.
- 3.7.(1) For the entry points in the NTS, the natural gas producers or storage facility operators, as the case may be, shall communicate to the TSO the following information:
- a) the natural gas quantity read, daily until 8.00 A.M.;
 - b) a copy of the *Monthly Record Log Book* of the electronic flow metering device, monthly, maximum up to the third working day of the month next to the supply month.
- (2) The *Monthly Record Log Book* of the electronic flow metering device shall be the basic document for the determination of the natural gas quantity transferred in NTS.
- (3) Together with the *Monthly Record Log Book* of the natural gas flow, a copy of the *Configuration Log Book* of the electronic flow metering device shall be communicated to the TSO.
- (4) The configuration data of the electronic flow metering device shall be input in the presence of the Parties' representatives.

3.8. (1) The gas turbine meters or the rotary piston gas meters used at NTS exit points shall be equipped with gas volume correctors type PTZ, according to the technical conditions set in the [Metering Regulation for the natural gas quantities traded in Romania](#).

(2) PTZ corrector setting specified in paragraph (1) shall be performed in the presence of the Parties.

(3) When mounting the gas turbine meters or the rotary piston gas meters, the lengths of the upstream and downstream sections set in the [Metering Regulation for the natural gas quantities traded in Romania](#) shall be observed.

3.9. If the basic metering systems do not meet the conditions for metering the natural gas quantities due to objective causes, the Parties shall mutually agree to carry out the natural gas quantity commercial metering by using the control systems (where they exist), until the relevant causes are eliminated, observing meanwhile the conditions concerning the access to the metering information set out in Article 3.4.

3.10.(1) The changes in the configuration of the basic metering system shall be made in the presence of the Parties, on a date mutually agreed with at least one day in advance.

(2) The changes specified in paragraph (1) shall be certified by the signature of the Minutes for change of the basic metering system configuration as described in Annexes 4.1, respectively, 4.2, by the Parties. According to the changes made in the basic metering system configuration, the natural gas quantity values determined shall be also adjusted.

(3) The changes in the basic metering system configuration shall be updated in the Technical Book of the technological installation specified in Article 2.1(f).

3.11.(1) The use of the mechanic recording devices in the commercial transactions at NTS entry/exit points shall be forbidden.

(2) NTS entry/exit point operators shall replace the existing mechanic recording devices used in commercial transactions in term of maximum 18 months from the date The Network Code comes into force.

(3) By way of derogation from the provisions of paragraph (1), during the period specified in paragraph (2), the use of the existing mechanic recording devices shall be accepted in the commercial transactions.

(4) Until on the date of decommissioning of the mechanic recording devices, the natural gas quantities shall be determined, using such devices, by applying the provisions of Annex 6 'Calculation Methodology for the mechanic system'.

Chapter 4 Natural Gas Metering System Review

- 4.1.** Metrological monitoring of the use and the regular metrological review of the natural gas metering systems shall be performed according to the applicable metrological rules, the presentation in view of carrying out the regular metrological review being the responsibility of the owner.
- 4.2.(1)** In case of misunderstandings concerning the natural gas quantities measured, the Parties may request a metrological review of the metering systems used in addition to the regular metrological review.
- (2) If it is found that the metering systems operate within the accuracy class range of the accepted deviations, the review costs shall be born by the claimant, otherwise being born by the metering system owner.
- 4.3.** The results of the reviews carried out according to the provisions of point 4.2 shall be recorded in the Minutes of the Review as presented in Annexes 5.1 – 5.4, signed by both Parties.
- 4.4.** Before re-commissioning the metering system, the compliance with the mounting conditions related to all metering elements reviewed and the re-making of the sealing to all mechanical joints shall be verified.
- 4.5.(1)** If an error, exceeding the accepted value or the value specified in the Model Approval Certificate, is found to one of the devices, following the review of the metering systems (basic or control systems), the relevant device shall be immediately recalibrated or replaced.
- (2) The basic metering systems or control systems shall be repaired according to the legal metrological rules applicable, this repair being the responsibility of their owner.

Chapter 5 Natural Gas Quality

- 5.1.(1) The natural gas traded through the NTS entry/exit points shall be compliant with the minimum quality requirements specified in these **Technical Conditions**⁷.
- (2) TSO shall charge penalties for not meeting the quality requirements in case of natural gas supplied in NTS, according to Annex 7.
- 5.2.(1) The natural gas quality shall be assessed based on its chemical composition and on the following physical properties:
- a) high calorific power and low calorific power;
 - b) Wobbe index;
 - c) density;
 - d) relative density;
 - d) compressibility factor;
 - e) water dew-point;
 - d) liquid hydrocarbon dew-point;
- (2) The natural gas contents of mechanic impurities and minimum quality requirements accepted in case of traded natural gas shall be as specified in Annex 3.
- 5.3.(1) The sampling points necessary to determine the natural gas quality shall be located on the metering system.
- (2) Samples for the analysis shall be collected according to SR ISO 10715 – Natural Gas – Sampling Method.
- (3) If samples are collected to settle some conflicts, then sampling shall be performed in the presence of the Parties' representatives, and the NU shall be also notified.
- 5.4.(1) The chemical composition and the physical properties listed in Article 5.2 of the natural gas shall be determined using a laboratory gas chromatograph and/or line gas chromatographs, according to the specifications of the *Metering Regulation for the natural gas quantities traded in Romania* and applicable legal regulations in force.

⁷ NOTE: Annex 3 'Minimum quality requirements for natural gas' is abrogated; this paragraph should be also abrogated.

- (2) The gas chromatographs shall be calibrated using standard gas mixtures, according to the calibration specifications or procedures of the chromatograph producers.
- (3) The time intervals between calibrations shall be those specified in the [Metering Regulation for the natural gas quantities traded in Romania](#), unless otherwise agreed by the Parties.
- 5.5.** The liquid hydrocarbon dew-point, hydrogen sulfide dew-point, mercaptan sulphur dew-point, and implicitly overall sulphur dew-point, shall be determined by the gas chromatographs or by the special analyzers.
- 5.6. (1)** The water dew-point and the liquid hydrocarbon dew-point shall be determined for the pressure and temperature of the entry point in the NTS.
- (2) The NU and/or its Partners (natural gas producer, importer, storage facility operator) shall ensure at the entry points in the NTS:
- a water dew-point of at least $-15\text{ }^{\circ}\text{C}$ at the supply pressure from the entry points in the NTS;
 - a liquid hydrocarbon dew-point of at least $0\text{ }^{\circ}\text{C}$ at the supply pressure from the entry points in the NTS;
- (3) The determinations specified in Paragraph (1) shall be carried out monthly or quarterly, unless otherwise agreed by Parties.
- 5.7. (1)** The quality parameters regularly determined shall be considered valid until their next determination.
- (2) In case of automatic determination of the quality parameters, the daily average values shall represent the base for the determination of the deviations from the accepted limits.
- 5.8. (1)** The claims of the Parties concerning the energy quantities traded shall be settled according to the provisions of the [Metering Regulation for the natural gas quantities traded in Romania](#).
- (2) If there are conflicts concerning the natural gas quality, samples designated to arbitration shall be collected and kept until the conflict settlement.
- (3) If no settlement in amiable manner is reached, the litigation shall be settled according to the applicable legal provisions.

- 5.9** TSO shall provide data concerning the value of the quality parameters within the term agreed upon with the NU, for all exit points.

Chapter 6 Providing data necessary for the operation and use of the NTS

- 6.1.** The informatics application created by the TSO shall ensure the data exchange between the TSO, the NU and NU Partners, necessary to safely and efficiently operate and use the NTS.

- 6.2.**(1) TSO shall record in weekly minutes (for gas week) and in monthly minutes (for calendar month), with the forms set out in the **Technical Conditions**, concluded with the natural gas producers, storage facility operators, distribution system operators and importers, the natural gas quantities metered at the physical entry or exit points of the NTS.

(2) After the implementation of the SCADA Program, TSO shall allow, upon request, the access to its own data: flows, pressures, temperatures.

- 6.3.** The natural gas producer shall provide the TSO, for each of the NTS physical entry points, the following data:

- a) the natural gas quantities metered, related PCS and energy as recorded in the weekly minutes (for gas week) and the monthly minutes (for calendar month) concluded between the Parties, in the form presented in Annex 2.1;
- b) hourly pressures, communicated by phone or e-mail;
- c) the flow impulses in the metering systems, upon TSO request, in view of a proper odorization;
- d) TSO's access to its own SCADA data, as flows, pressures, temperatures, after SCADA implementation.

- 6.4.** The natural gas storage facility operator shall provide the TSO the following data:

- a) injection schedule for April – September, until March 15;
- b) extraction schedule for October – March, until September 15;
- c) monthly injection/extraction schedule, until on the 20th day of the prior month;

- d) nominations (re-nominations) per important points for each NU, according to the provisions of The Network Code;
- e) daily until 08.00 A.M., send the volumes and PCS per each of the important points together with the allocation per each of NUs for the prior gas day;
- f) send the final volumes and PCS for all important points with the allocation per each NU, after the end of the calendar month;
- g) communicate to the TSO for each entry/exit point to/from the natural gas storage facility the following data:
 - the natural gas quantities metered, related PCS and energy as recorded in the weekly minutes (for gas week) and the monthly minutes (for calendar month) concluded between Parties, communicated according to the form presented in Annex 2.3;
 - the hourly flows and pressures – by phone or e-mail.
 - h) Send to the TSO the flow impulses in the metering systems, upon TSO request, in view of gas odorization;
 - i) after SCADA implementation allow access of the TSO to its own SCADA data, as flows, pressures, temperatures,

6.5. The distribution system operator shall provide the following data to the TSO:

- a) the distribution schedule for all NTS exit points:
 - per gas year, broken down by months (until May 15);
 - per calendar year, broken down by months (until October 15);
 - per month (until the 20th day of the prior month).
- b) the volumes allocated per each NU in NTS exit points for the prior gas day, to be communicated daily until to 12.00 P.M. according to the provisions of The Network Code;
- c) the final volumes allocated per each NU in all NTS exit points, to be communicated after the end of the calendar month;
- d) the natural gas quantities in NTS physical exit points, as recorded in term of 2 days, in the weekly minutes (for gas week) and monthly minutes (for calendar month) concluded with TSO in a form described in Annexes 2.4 and 2.5;

6.6. The importer shall provide the following data to the TSO:

- a) the import schedule for all NTS entry points:
 - per gas year, broken down by months (until May 15);
 - per calendar year, broken down by months (until October 15);
 - per month (until on the 20th day of the prior month).
- b) nominations (re-nominations) for each NU, according to the provisions of The Network Code;
- c) the volumes allocated per each NU for the prior gas day, daily until 08.00 A.M., according to the provisions of The Network Code;
- d) the final volumes allocated per NUs in all NTS entry/exit points, after the end of the calendar month;
- e) the natural gas quantities metered in all NTS physical entry points, as recorded by it in the weekly minutes (for gas week) and monthly minutes (for the calendar month) concluded with the TSO, according to the form described in Annex 2.2.

Annex 1

(to the Technical Conditions)

Conversion formulas Equivalence with other measurement units used frequently

For the application of these **Technical Conditions**, also other units are tolerated, as follows:

1) For pressure:

In the IS, the unit for the pressure is Pascal (*Pa*) $1 Pa = 1 N/m^2$

The conversion formulas in case other units than the standard ones are used, are presented in the table below:

Pressure Unit	Pa (N/m ²)	Bar	Mm Hg (1 Torr)	mm H ₂ O	Technical atmosphere (at), Kg/cm ²	Physical atmosphere (atm)
---------------	------------------------	-----	----------------	---------------------	---	---------------------------

Pa (N/m ²)	1	10 ⁻⁵	7.50064 x 10 ⁻³	0.101972	0.101972 x 10 ⁻⁵	0.98692 x 10 ⁻⁵
bar	10 ⁵	1	750.064	1.01972 x 10 ⁴	1.01972	0.98692
mm Hg (1 Torr)	133.322	1.33322 x 10 ⁻³	1	13.5951	13.5951 x 10 ⁻⁴	1.31579 x 10 ⁻³
mm H ₂ O	9.80665	9.80665 x 10 ⁻⁵	0.073556	1	10 ⁻⁴	9.67837 x 10 ⁻⁵
Technical atmosphere (at), Kgf/cm	9.80665 x 10 ⁴	0.98066	735.559	10 ⁴	1	0.967841
Physical atmosphere (atm)	10.1325 x 10 ⁴	1.01325	760	1.03323 x 10 ⁴	1.03323	1

2) For temperature:

In the IS, the unit for the temperature is *Kelvin* (K).

The conversion formulas, in case units tolerated other than the standard ones are used, are the following:

- a) if *Celsius* degree (°C) are used: $T(K) = t(^{\circ}C) + 273.15$
- b) if *Fahrenheit* degree (°F) are used: $T(K) = [t(^{\circ}F) + 459.67]/1.8$

3) For volume:

In the IS, the unit for volume is the cube meter (m³).

In these **Technical Conditions**, cube meter (m³) means the natural gas quantity occupying a volume of a cube with the side of 1 m, under the basic conditions specified in the ANRE regulations.

High Calorific Power

The High Calorific Power shall be expressed in kWh/m³ or in GJ/m³.

The combusting temperature is specified in the ANRE regulations.

The calorific power units shall be converted according to SR ISO 13443.

Reference condition

The gas condition under working conditions is characterized by the P and T and by compressibility factor (Z).

The universal actual gas law is: $PV = \nu RTZ$

where P - is the absolute pressure of the gas expressed in N/m²

V - is the gas volume expressed in m³

ν - is the substance quantity expressed in kmol

R - is the universal gas constant expressed in J/kmol K

T - is the absolute temperature of the gas expressed in K

Z - is the compressibility factor (not dimensional)

To convert a natural gas volume V under certain pressure and temperature at the condition characteristic to the cube meter as defined in these **Technical Conditions**, the following formula shall be used:

$$V_r = V \times P/P_r \times T_r/T \times Z_r/Z$$

Annex 2.1

(to the Technical Conditions)

Natural Gas Transfer/Takeover Minutes (GTTM) No
 (for natural gas quantities transferred in the NTS)

Concluded today, (dd/mm/yy), between:

.....as **PRODUCER**

and

SNTGN TRANSGAZ SA MEDIAȘ, as LICENSED NATURAL GAS NATIONAL TRANSMISSION SYSTEM OPERATOR (TSO).

We certify hereby that during the period....., the overall natural gas quantity ofm³, respectively, of.....kWh, has been transferred, respectively, taken over through the gas metering systems, according to the specifications set at page in the Annex.

Parties are recording, by mutual agreement, the following:

- the transfer/takeover of the natural gas quantities in/from NTS, has been performed according to the provisions of the Technical Conditions;
- the natural gas quantities specified in the Annex are those recognized by the Network Users.

REMARKS:

.....

TRANSFERRED BY,

TAKEN OVER BY,

.....

.....

PRODUCER REPRESENTATIVE

TSO REPRESENTATIVE

Name.....

Name.....

First name.....

First name.....

Signature.....

Signature.....

The Minutes hereby were drafted in 2 counterparts with same legal power of the original, one for each Party.

ANNEX TO THE GTTM NO....

No	MP Name	OVERALL QUANTITY			OVERALL QUANTITY BROKEN DOWN PER GAS BENEFICIARIES		
		Volume (m ³)	PCS (kWh/m ³)	Energy (kWh)	Gas Beneficiary Name	QUANTITY	
						Volume (m ³)	Energy (kWh)
1					1.1.....		
					1.2.....		
					1.n.....		
2					2.1.....		
					2.2.....		
					2.n.....		
.....						
n					n.1.....		
					n.2.....		
					n.3.....		

Transferred by,

Taken over by,

Sub-Unit

Sub-Unit

PRODUCER REPRESENTATIVE

TSO REPRESENTATIVE

Signature

Signature

.....

.....

Annex 2.2

(to the Technical Conditions)

Natural Gas Transfer/Takeover Minutes (GTTM) No.....

Concluded today,(dd/mm/yy), between
, as **IMPORTER⁸**

and

**SNTGN TRANSGAZ SA MEDIAS, as LICENSED NATURAL GAS NATIONAL
 TRANSMISSION SYSTEM OPERATOR (TSO).**

We certify hereby that during the period, the natural gas overall
 quantity of m³, namely kWh, was transferred, respectively,
 taken-over, through the gas metering station (GMS), according to the Annex (page...)
 specifications.

The Parties are recording, by mutual agreement, the following:

- the natural gas quantities have been transferred – taken-over in NTS by
 complying with the provisions of the Technical Conditions.
- the natural gas quantities, mentioned in the Annex, are those acknowledged by
 the Network Users.

REMARKS

.....

TRANSFERRED BY
IMPORTER REPRESENTATIVE

TAKEN OVER BY
TSO REPRESENTATIVE

⁸ If there are several importers:
 - GTTM shall be signed by the importer authorised by the other importers, or
 - GTTM, executed in two (2) counterparts, shall be signed by each importer.

First Name First Name
 Name Name
 Signature Signature

The Minutes hereby were drawn up in 2 counterparts, one for each Party.
 Pcs is at reference measurement $t = 15^{\circ}\text{C}$ and reference burning $t = 15^{\circ}\text{C}$
 The volume is at 15°C and the pressure is of 1.01325 bar

ANNEX TO GTTM No

No.	GMS Name	OVERALL QUANTITY			OVERALL QUANTITY BROKEN DOWN ON GAS BENEFICIARIES		
		VOLUME [m ³]	PCS [kWh/ m ³]	ENERGY [kWh]	GAS BENEFICIARY NAME	QUANTITY	
						VOLUME [m ³]	ENERGY [kWh]
1					1.1.		
					1.2.		
					1.n.		

TRANSFERRED BY
 IMPORTER REPRESENTATIVE
 Signature

TAKEN OVER BY
 TSO REPRESENTATIVE
 Signature

Annex 2.3

(to the Technical Conditions)

STORED NATURAL GAS TRANSFER/TAKEOVER MINUTES (SGTTM) NO.....

(for the natural gas quantities entered/exited to/from the NTS)

Concluded today,(dd/mm/yy), between:

**SNTGN TRANSGAZ SA MEDIAS, as LICENSED NATURAL GAS NATIONAL
TRANSMISSION SYSTEM OPERATOR (TSO)**

and

....., as **LICENSED STORAGE FACILITY OPERATOR (SFO).**

We certify hereby that between, the natural gas overall quantity of m³, namely kWh, was transferred, respectively, was taken-over, through the gas metering panel (MP)....., for the purpose of injecting in/extracting from the storage, according to the Annex specifications (page).

The parties are recording, by mutual agreement, the following:

- the natural gas quantities have been transferred – taken-over in NTS by complying with the provisions of the Technical Agreement.
- the natural gas quantities, mentioned in the Annex, are those acknowledged by the network users.

REMARKS

.....

**TRANSFERRED BY
SUBUNIT**

**TAKEN-OVER BY
SUBUNIT**

.....

.....

**TSO REPRESENTATIVE⁶/SFO
REPRESENTATIVE⁷**

**TSO REPRESENTATIVE⁸/SFO
REPRESENTATIVE⁹**

First Name

First Name

Name

Name

Signature

Signature

The Minutes hereby were drawn up in 2 counterparts, one for each party.

Pcs is at reference measurement $t = 15^{\circ}\text{C}$ and reference burning $t = 15^{\circ}\text{C}$

The volume is at 15°C and the pressure is of 1.01325 bar

ANNEX TO SGTMM No.

No.	MP/STORAGE FACILITY NAME	OVERALL QUANTITY			OVERALL QUANTITY BROKEN DOWN ON NETWORK USERS		
		VOLUME [m ³]	PCS [kWh/ m ³]	ENERGY [kWh]	NETWORK USER NAME	QUANTITY	
						VOLUME [m ³]	ENERGY [kWh]
1					1.1.		
					1.2.		
					1.n.		

**TRANSFERRED
SUBUNIT**

**TAKEN OVER
SUBUNIT**

.....

.....

⁷ For the injection cycle.

⁶ For the injection cycle.

⁷ For the extraction cycle

⁸ For the injection cycle.



**TSO REPRESENTATIVE¹⁰/ SFO
REPRESENTATIVE¹¹**

Signature

**TSO REPRESENTATIVE¹²/SFO
REPRESENTATIVE¹³**

Signature

⁹ For the extraction cycle.

¹⁰ For the injection cycle.

¹¹ For the extraction cycle.

¹² For the injection cycle.

Annex 2.4
(to the Technical Conditions)

GAS TRANSFER – TAKEOVER MINUTES ON MRS (GTTM_1) NO.....
 (total)

(only for the natural gas quantities transferred on the distribution systems)

Concluded today,(dd/mm/yy), between:

**SNTGN TRANSGAZ SA MEDIAS, as LICENSED NATURAL GAS NATIONAL
TRANSMISSION SYSTEM OPERATOR (TSO)**

and

....., as **LICENSED DISTRIBUTION SYSTEM OPERATOR
(DSO).**

We certify hereby that between, the natural gas overall quantity of m³, namely kWh, was transferred, respectively, was taken-over, through the gas regulating/metering station (GR/MS), according to the Annex specifications (page).

The parties agree and register the following:

- the natural gas quantities have been transferred – taken-over in NTS by complying with the provisions of the Technical Agreement.
- the supplied natural gas have been odorized according to the regulations in force, and had a perceivable smell, which allowed easy detection of emissions.

REMARKS

.....

TRANSFERRED BY

TAKEN OVER BY

SUBUNIT

.....

SUBUNIT

.....

TSO REPRESENTATIVE

First Name

Name

Signature

DSO REPRESENTATIVE

First Name

Name

Signature

The Minutes hereby were drawn up in 2 counterparts, one for each party.

Pcs is at measurement reference $t = 15^{\circ}\text{C}$ and reference burning $t = 15^{\circ}\text{C}$

The volume is at 15°C and the pressure is of 1.01325 bar.

ANNEX TO GTTM No

No.	RMS NAME	GAS		OVERALL QUANTITY		
		METER/RECTIFIER	INDEX VALUE	VOLUME	PCS	ENERGY
		NEW	OLD	[m ³]	[kWh/ m ³]	[kWh]
		INDEX	INDEX			
1						
2						
...						
n						

TRANSFERRED

SUBUNIT

.....

TAKEN-OVER

SUBUNIT

.....



SOCIETATEA NAȚIONALĂ DE TRANSPORT
GAZE NATURALE "TRANSGAZ" SA MEDIAȘ
Capital social: 117 738 440,00 LEI
ORC: J32/301/2000; C.I.F.: RO13068733
P-ta C. I. Motaș nr. 1, cod: 551130, Mediaș, Jud. Sibiu
Tel.: 0040 269 803333, 803334; Fax: 0040 269 839029
http://www.transgaz.ro; E-mail: cabinet@transgaz.ro



The Network Code Of The National Gas
Transmission System - updated on 28
December 2011
(This version shall enter into force as of 1 April
2012.)

TSO REPRESENTATIVE

Signature

.....

DSO REPRESENTATIVE

Signature

.....

Annex 2.5

(to the Technical Conditions)

GAS TRANSFER – TAKEOVER MINUTES ON RMS (GTTM_2) NO.....

(broken down on supplier)

(only for the natural gas quantities transferred in the distribution systems)

Concluded today,(dd/mm/yy), between:

**SNTGN TRANSGAZ SA MEDIAS, as LICENSED NATURAL GAS NATIONAL
TRANSMISSION SYSTEM OPERATOR (TSO)**

and

....., as **LICENSED DISTRIBUTION SYSTEM OPERATOR
(DSO).**

We certify hereby that between, the natural gas overall quantity of m³, namely kWh, was transferred, respectively, was taken-over, through the gas regulating/metering stations, according to the natural gas transfer/takeover minutes (GTTM_1) and to the Annex specifications (page).

The parties agree and register the following:

- the natural gas quantities have been transferred – taken-over in the NTS by complying with the provisions of the Technical Agreement.
- the natural gas quantities, mentioned in the Annex, are those acknowledged by the suppliers.
- the supplied natural gas have been odorized according to the regulations in force, and had a perceivable smell, which allowed easy detection of emissions.

REMARKS

.....

TRANSFERRED,

TAKEN OVER,

TSO

Manager ...

.....

DSO

Manager ...

.....

The Minutes hereby were drawn up in 2 counterparts, one for each party.

No.	MRS NAME	OVERALL QUANTITY			OVERALL QUANTITY BROKEN DOWN ON SUPPLIERS		
		VOLUME [m ³]	PCS [kWh/ m ³]	ENERGY [kWh]	SUPPLIER NAME	QUANTITY	
						VOLUME [m ³]	ENERGY [kWh]
1					1.1.		
					1.2.		
					1.n.		
2					2.1.		
					2.2.		
					2.n.		
...							
n					n.1.		
					n.2.		
					n.3.		

TRANSFERRED,

TSO

Manager ...

.....

TAKEN OVER,

DSO

Manager ...

.....

Annex 2.6

(to the Technical Conditions)

GAS TRANSFER – TAKEOVER MINUTES ON MRS (ECGTTM) NO.....

(only for the natural gas quantities transferred to the end customers, branched directly to the NTS)

Concluded today,(dd/mm/yy), between:

SNTGN TRANSGAZ SA MEDIAS, as LICENSED NATURAL GAS NATIONAL TRANSMISSION SYSTEM OPERATOR (TSO)

and

....., as **LICENSED SUPPLIER (SUPPLIERS)**.

We certify hereby that between, the overall natural gas quantity of m³, namely kWh, was transferred, respectively, was taken-over, through the RMS, according to the Annex specifications (page).

The parties agree and register the following:

- the natural gas quantities have been transferred – taken-over in the NTS by complying with the provisions of the Technical Agreement.

REMARKS

.....

**TRANSFERRED,
 SUBUNIT.....**

TAKEN OVER,

.....

TSO REPRESENTATIVE

SUPPLIER(S) REPRESENTATIVE (S)

First Name

First Name

Name

Name

Signature

Signature

The Minutes hereby were drawn up in ... counterparts, one for each party.

Pcs is at reference measurement $t = 15^{\circ}\text{C}$ and reference burning $t = 15^{\circ}\text{C}$

The volume is at 15°C and the pressure is of 1.01325 bar

ANNEX TO ECGTTM No

No.	RMS NAME	OVERALL QUANTITY			OVERALL QUANTITY BROKEN DOWN ON SUPPLIERS		
		VOLUME [m ³]	PCS [kWh/ m ³]	ENERGY [kWh]	SUPPLIER NAME	QUANTITY	
						VOLUME [m ³]	ENERGY [kWh]
1					1.1.		
					1.2.		
					1.n.		

TRANSFERRED,

SUBUNIT

TSO REPRESENTATIVE

Signature

.....

TAKEN OVER,

SUBUNIT

SUPPLIER (S) REPRESENTATIVE (S)

Signature

.....

Annex 2.7

(to the Technical Conditions)

GAS TRANSFER – TAKEOVER MINUTES (NUGTTM) NO...
(for the overall transmitted natural gas quantity)

Concluded today,(dd/mm/yy) between:

**SNTGN TRANSGAZ SA MEDIAȘ, as LICENSED NATURAL GAS NATIONAL
TRANSMISSION SYSTEM OPERATOR (TSO)**

and

....., as **NETWORK USER.**

We certify hereby that between, the natural gas overall quantity of m³, namely kWh, was transferred, respectively, was taken-over, through the gas regulating/metering stations, according to the natural gas transfer/takeover minutes (GTTM_1, GTTM_2, ECGTTM) and to the Annex specifications (page).

The parties agree and register the following:

- the natural gas quantities have been transferred – taken-over in the NTS by complying with the provisions of the Technical Agreement.
- the supplied natural gas have been odorized according to the regulations in force, and had a perceivable smell, which allowed easy detection of emissions.

REMARKS

.....

For
SNTGN TRANSGAZ SA MEDIAȘ
 Manager ...

For
S.C.....
 Manager ...

.....

.....

The Minutes hereby were drawn up in ... counterparts, one for each party.

No.	RMS NAME	OVERALL QUANTITY		
		VOLUME [m ³]	PCS [kWh/ m ³]	ENERGY [kWh]
1				
2				
...				
n.				

SNTGN TRANSGAZ SA MEDIAS

S.C.....

Manager ...

Manager ...

.....

.....

Annex 3

(to the Technical Conditions)

Minimum quality requirements for the natural gas¹⁴

1. The chemical composition of the natural gas

<i>Name and chemical formula of the components</i>	<i>Content in molar %</i>
Methane (C1)	min. 70
Ethane (C2)	max. 10
Propane (C3)	max. 3.5
Butane (C4)	max. 1.5
Pentane (C5)	max. 0.5
Hexane (C6)	max. 0.1
Heptanes (C7)	max. 0.05
Sum: octane (C8) and high hydrocarbons (C9)	max. 0.05
Nitrogen (N ₂)	max. 10
Carbon dioxide (CO ₂)	max. 8
Oxygen (O ₂)	max. 0.02
Hydrogen Sulphide (H ₂ S)	max. 6.8 mg/m ³
Ethyl mercaptan (C ₂ H ₅ SH) ¹⁵	min. 8 mg/m ³
Total sulphur on a short period	max. 100 mg/m ³

2. The water dew point (°C): max. -15°C, at the pressure in the commercial transfer/takeover point.

3. The liquid hydrocarbons dew point (°C): max. 0°C, at the pressure in the commercial transfer/takeover point.

¹³ For the extraction cycle.

¹⁴ Annex 3 is abrogated.

¹⁵ except the gas supplied for chemicalization, where the odorization degree is established by mutual agreement.

- ~~4. The minimum value allowed for the superior caloric power distributed per volume, is 7840 Kcal/m³.~~
- ~~5. The maximum temperature allowed for the natural gas: 50°C.~~
- ~~6. The mechanical impurities content (g/m³): max. 0.05.~~

”

Annex 4.1.
 to the *Technical Conditions*

Minutes for change of the mechanic metering installation of(date).

Name of the metering point
 Modification of the metering orifice (**Yes/No**)

Type **Series**.....**d20 inner diameter** **mm**
Material.....**Linear dilatation coefficient λd**.....**K⁻¹**

Other remarks:

Persons attending on behalf of

on behalf of the TSO

Signature **TSO**

Annex 4.2.
 to the *Technical Conditions*

Minutes for the change of the electronic metering installation of.....(date)

Name of the metering point

Modification of the metering orifice (**Yes/No**)

Type **Series**.....d20 inner diameter mm

Material.....**Linear dilatation coefficient λd** K⁻¹

Modification of the electronic monitoring computer (**Yes/No**)

Modification of absolute pressure transducer (**Yes/No**)

Type**Series**..... **Test report no.**

Work domain.....bar, **Allowed error**

- Modification of 1 differential pressure transducer (**Yes/No**)

Type **Series**..... **Test report no.**

Work domain.....mmH2O, **Allowed error**

- Modification of 2 differential pressure transducer (**Yes/No**)

Type **Series**..... **Test report no.**

Work domain.....mmH2O, **Allowed error**

- Modification of temperature transducer (**Yes/No**)

Type **Series**..... **Test report no.**



Work domain.....°C, Allowed error

Other remarks:

Persons attending on behalf of

on behalf of the TSO:

Annex no. 5.1
to the *Technical Conditions*

Minutes for testing the natural gas electronic metering system

Concluded today at the metering pointupon testing the electronic system, having the following components:

- The absolute pressure transducer error**
- The 1 differential pressure transducer error**
- The 2 differential pressure transducer error**
- The temperature transducer error**

The components of the installation are/are not included in the accuracy class.

Other remarks:

Persons attending on behalf of

on behalf of the TSO

.....

TSO

Annex 5.2
to the *Technical Conditions*

**CHART
Absolute Pressure Transducer Testing Results**

The location of the transducer

TypeSeries Accuracy classAllowed error

Calibrator TYPE..... Series ...Accuracy classCalibration certificate no

Testing metrologist Test date

Values obtained

Simulated value		Exit signal, I _c calculated	Exit signal, I _e measured		Error		Observations
			U	C	U	C	
%	KPaA	mA	mA	mA			
0							
10							
20							
30							
40							
50							
60							
70							
80							
90							
100							

Annex 5.3
to the *Technical Conditions*

CHART

Differential Pressure Transducer Testing Results

The location of the transducer

Type Series Accuracy class Allowed error

Calibrator type..... Series Accuracy class Calibration certificate no

Testing metrologist Test date

Values Obtained

Simulated value		Exit signal, Ic calculated	Exit signal, Ie measured		Error		Observations
			U	C	U	C	
%	MmH2O	mA	mA	mA			
0							
10							
20							
30							
40							
50							
60							
70							
80							
90							
100							

Annex 5.4
 to the *Technical Conditions*

CHART
Temperature Transducer Testing Results

The transducer location

TypeSeriesAccuracy classAllowed error

Calibrator type..... SeriesAccuracy classCalibration certificate no

Testing metrologist Test date

Values Obtained

Simulated value		Maximum allowed deviations		Exit signal, R _{tm} (Ω) measured		Error		Observations
						U	C	
T (°C)	R _t (Ω)	(Ω)	(°C)	U	C			

Annex 6

to the *Technical Conditions*

Metering natural gas using the mechanical recording systems

If the natural gas quantities are determined by using, daily, a mechanic metering system, each graph shall contain the values obtained by planimetry, namely the planimeted or average temperature of the gas, the barometrical pressure, the characteristics of the relief valve and of the measuring device, as well as the resulted gas quantity. These values shall be certified by the signature of the person performing the calculations. The used graphs shall be previously controlled and accepted by both parties, and shall be kept for a 5 years period.

If the differential pressure is recorded on the graph as band, depending on the bandwidth the following actions shall be undertaken:

- if the width is of 1 – 3 mm, the planimetry shall be executed on the middle of the band;
- if the width is of 3 – 5 mm, the planimetry shall be executed on the lower side of the band (lh1) and on the upper side (lh2), and the calculation shall include the $lh = lh1 + 1/3 (lh2 - lh1)$ value;
- if the width is of 5 mm or bigger, the planimetry shall be executed on the lower side of the band.

The calculation methodology for the mechanic system

Subsequent to the measurement execution with a mechanic recorder for differential pressure, to determine the natural gas quantities transmitted through that flowing section, it is necessary to apply the calculation algorithm compliant with the standard provisions, on which the measurement was based, namely ISO 5167. This calculation algorithm, implemented on the electronic computer, is presented below.

1. Entering the initial data

- the characteristics of the metering point (point definition, technical characteristics of the metering devices and lines);
- the daily values of the parameters and physical values, included in the calculation and resulted from the measurement (planimentering)

2. Storing the initial data, used for the flow calculation

3. Calculation of natural gas daily flow

3.1 Values initially established for Q1 and RE

With regard to the gas flow calculation, within the first approximation the following initial values are established for Q1 and RE:

$$Q1 = 0$$

$$RE = 10^6$$

3.2 Values initially calculated based on the daily metering and on the fixed data

3.2.1 The average temperature of the gas t:

if the temperature is measured with the thermometer from the panel

t = the arithmetic average of the gas temperature during the day [1]

if the temperature is recorded on the circular graph

$$t = I_t^2 \cdot \frac{(t_{\max} - t_{\min})}{25} + t_{\min} \quad [2]$$

3.2.2 diameters ratio β is:

$$\beta = \frac{d_e}{D} \quad [3]$$

3.2.3 Pressure Correction Factor f_p :

$$f_p = \frac{1,5647}{1,608 - 0,0722 \cdot \text{dens} + 0,01 \cdot \text{co}_2 - 0,00392 \cdot \text{n}_2} \quad [4]$$

where co_2 and n_2 are the molar percentages of the carbon dioxide and nitrogen.

3.2.4. Partial formula for f_{px} is:

$$f_{px} = 0.01450376 \cdot f_p \quad [5]$$

3.2.5. The Temperature Correction Factor f_t is:

$$f_t = \frac{2,2629}{0,9915 + 2,119 \cdot \text{dens} - 0,01 \cdot \text{co}_2 - 0,01681 \cdot \text{n}_2} \quad [6]$$

3.2.6. Gas Density ρ_s at 15°C

$$\rho_s [\text{kg/m}^3] = \text{dens} \cdot 1,225442 \quad [7]$$

where:

$$1.225442 = \rho_{\text{air}} \text{ at } 15^\circ\text{C}$$

3.2.7. Pseudo-critical temperature T_{pc} , expressed in °K:

$$T_{pc} [\text{°K}] = 88,25 \cdot [1,7591 \cdot (0,56364 + \rho_s) - 0,01 \cdot (\text{co}_2 + 1,681 \cdot \text{n}_2)] \quad [8]$$

3.2.8. Pseudo-critical pressure P_{pc} , expressed in bar:

$$P_{pc} [\text{bar}] = 30,168 \cdot 0,980665 \cdot [0,05993 \cdot (26,831 - \rho_s) + 0,01 \cdot (\text{co}_2 - 0,392 \cdot \text{n}_2)] \quad [9]$$

3.2.9. Determination of the coefficients α_{ij} of the formula for the calculation of the flow coefficient α (where i = type of primary element).

The calculation formula for α_{ij} is different according to the type of the primary element used.

Therefore,

If $te = 1$:

$$\alpha_{11} = (0,99 - 0,2262 \cdot \beta^{4,1}) \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [10]$$

$$\alpha_{12} = (0,00175 \cdot \beta^2 - 0,0033 \cdot \beta^{4,15}) \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [11]$$

If $te = 2$:

$$\alpha_{21} = 0,9965 \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [12]$$

$$\alpha_{22} = 0,00653 \cdot \beta^{0,5} \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [13]$$

If $te = 3$:

$$\alpha_{31} = (0,5959 + 0,0312 \cdot \beta^{2,1} - 0,184 \cdot \beta^8) \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [14]$$

$$\alpha_{32} = 0,0029 \cdot \beta^{2,5} \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [15]$$

The coefficient α_{33} is calculated differently, according to the value of the diameter D , using the following formula:

a) if $D \leq 58.62$ mm:

$$\alpha_{33} = 0,9906 \cdot \frac{\beta^4}{D \cdot (1-\beta^4)} \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [16]$$

b) if $D > 58.62$ mm:

$$\alpha_{33} = 2,286 \cdot \frac{\beta^4}{D \cdot (1-\beta^4)} \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [17]$$

$$\alpha_{34} = 0,85598 \cdot \frac{\beta^3}{D} \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [18]$$

If $t_e = 4$:

$$\alpha_{41} = (0,5959 + 0,0312 \cdot \beta^{2,1} - 0,184 \cdot \beta^8) \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [19]$$

$$\alpha_{42} = 0,0029 \cdot \beta^{2,5} \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [20]$$

If $t_e = 5$:

$$\alpha_{51} = (0,5959 + 0,0312 \cdot \beta^{2,1} - 0,184 \cdot \beta^8) \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [21]$$

$$\alpha_{52} = 0,0029 \cdot \beta^{2,5} \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [22]$$

$$\alpha_{53} = \left(0,039 \cdot \frac{\beta^4}{(1-\beta^4)} - 0,01584 \cdot \beta^3\right) \cdot \frac{1}{(1-\beta^4)^{0,5}} \quad [23]$$

3.2.10. The relative static pressure E is:

$$E[\text{bar}] = I_p^2 \cdot \frac{P_{\max}[\text{bar}]}{25} \quad [24]$$

3.2.11. The absolute static pressure P:

Is determined in two ways based on the type of the metering unit of the barometric pressure:

a) if $t_{\text{umb}} = 1$, then

$$P[\text{bar}] = E[\text{bar}] + \frac{B[\text{mmHg}]}{750,062} \quad [25]$$

b) if $t_{\text{umb}} = 2$, then

$$P[\text{bar}] = E[\text{bar}] + B[\text{bar}] \quad [26]$$

3.2.12. The differential pressure H is:

$$H[\text{mmH}_2\text{O}] = I_h^2 \cdot \frac{H_{\max}[\text{mmH}_2\text{O}]}{25} \quad [27]$$

3.2.13. The relative temperature compared to T_{pc} is

$$T_r = \frac{t+273,155}{T_{pc}} \quad [28]$$



3.2.14. The relative pressure compared to P_{pc} is

$$P_r = \frac{P}{P_{pc}} \quad [29]$$

3.2.15. The dynamic viscosity μ of the gas expressed in [cP] is:

$$\mu[\text{cP}] = 3,24 \cdot 0,001 \cdot \left[\frac{(t+273,155)^{0,5} + 1,37 - 9,09 \cdot \rho_s^{0,125}}{\rho_s^{0,5} + 2,08 - 1,5 \cdot 0,01 \cdot (co2+n2)} \right] \cdot \left[1 + \frac{P_r^2}{30 \cdot (T_r - 1)} \right] \quad [30]$$

3.2.16. The expression RE_{fixed} :

Starting from the expression of the Reynolds figure:

$$RE = \frac{4 \cdot q_m}{\pi \cdot \mu \cdot D} \quad [31]$$

where:

q_m is the gas mass flow expressed in kg/sec

μ is the gas dynamic viscosity, expressed in Pa x sec

D is the diameter of the gas metering panel expressed in linear meter

and taking into account the following relation between the mass flow and the volume flow:

$$q_m = q_v \cdot \rho_s \quad [32]$$

where:

q_v = the volume flow expressed in m³/sec

ρ_s = gas density expressed in kg/m³,

then, RE expression become:

$$RE = \frac{4 \cdot q_v \cdot \rho_s}{\pi \cdot \mu \cdot D} \quad [33]$$

where

q_v = the volume flow expressed in m³/sec

ρ = gas density expressed in kg/m³

μ = the gas dynamic viscosity, expressed in Pa x sec

D = the diameter of the gas metering panel expressed in linear meter

Because

$$1 \text{ m}^3/\text{h} = 3600 \text{ m}^3/\text{sec}$$



$$1 \text{ m} = 1000 \text{ mm}$$

$$1 \text{ Pa} \cdot \text{sec} = 1000 \text{ cP}$$

Results that:

$$q_v [\text{m}^3/\text{s}] = \frac{q_{vh} [\text{m}^3/\text{h}]}{3600} \quad [34]$$

$$D [\text{m}] = \frac{D [\text{mm}]}{1000} \quad [35]$$

$$\mu [\text{Pa} \cdot \text{s}] = \frac{\mu [\text{cP}]}{1000} \quad [36]$$

If q_{vh} [m^3/h], D [m], μ [cP] are replaced by the above mentioned equivalent expressions, then RE becomes:

$$RE = \frac{4 \cdot q_{vh} [\text{m}^3/\text{h}] \cdot \rho_s [\text{kg}/\text{m}^3]}{\pi \cdot 3600 \cdot \mu [\text{cP}] \cdot D [\text{m}] \cdot 10^{-3}} \cdot 1000 \quad [37]$$

If the hourly volumetric flow is noted with Q_h and the calculations from the above mentioned formula are made, RE becomes:

$$RE = 0,353677 \cdot 1000 \cdot \frac{\rho_s [\text{kg}/\text{m}^3]}{\mu [\text{cP}] \cdot D [\text{m}]} \cdot Q_h \quad [38]$$

If the expression by which the hourly flow rate Q_h is multiplied is noted with RE_{fix}

$$RE_{\text{fix}} = 0,353677 \cdot 1000 \cdot \frac{\rho_s [\text{kg}/\text{m}^3]}{\mu [\text{cP}] \cdot D [\text{mm}]} \quad [39]$$

and the formula for RE becomes:

$$RE = RE_{\text{fix}} \cdot Q_h \quad [40]$$

3.2.17. The adiabatic coefficient K:

$$K = 1,29 + 0,704 \cdot 10^{-6} \cdot [2575 + (73,045 - t)^2] \cdot P \cdot 1,01972 \quad [41]$$

3.2.18. The ratio between static pressure downstream the primary element and the static pressure upstream the primary element:

$$\tau = (P - \Delta P)/P:$$

meaning

$$\tau = \frac{P - H \cdot 9,80665 \cdot 10^{-5}}{P} \quad [42]$$

3.2.19. The ratio $X = \Delta P/(P \times K)$:

$$X = \frac{H \cdot 9,80665 \cdot 10^{-5}}{P \cdot K} \quad [43]$$

3.2.20. Q_{fix} expression:

$$Q_{fix} = 0,21116526 \cdot d e^2 \cdot \frac{1}{\sqrt{\rho_s}} \cdot \sqrt{\frac{P \cdot H}{t + 273,155}} \quad [44]$$

3.2.21. The detent coefficient ε :

$$\varepsilon = \left[\left(\frac{\kappa \cdot \tau^{\frac{2}{\kappa}}}{\kappa - 1} \right) \cdot \left(\frac{1 - \beta^4}{1 - \beta^4 \cdot \tau^{\frac{2}{\kappa}}} \right) \cdot \left(\frac{1 - \tau^{\frac{\kappa - 1}{\kappa}}}{1 - \tau} \right) \right]^{0,5} \quad [45]$$

a) if $t_e = 1$ or 2 :

b) if $t_e = 3$ or 4 or 5 :

$$\varepsilon = 1 - (0,41 + 0,35 \cdot \beta^4) \cdot X \quad [46]$$

3.2.22. The flow coefficient α :

If $t_e = 1$:

$$\alpha = \alpha_{11} - \alpha_{12} \cdot \left(\frac{10^6}{RE} \right)^{1,15} \quad [47]$$

If $t_e = 2$:

$$\alpha = \alpha_{21} - \alpha_{22} \cdot \left(\frac{10^6}{RE} \right)^{0,5} \quad [48]$$

If $t_e = 3$:

$$\alpha = \alpha_{31} + \alpha_{32} \cdot \left(\frac{10^6}{RE}\right)^{0,75} + \alpha_{33} - \alpha_{34} \quad [49]$$

If $te = 4$:

$$\alpha = \alpha_{41} + \alpha_{42} \cdot \left(\frac{10^6}{RE}\right)^{0,75} \quad [50]$$

If $te = 5$:

$$\alpha = \alpha_{51} + \alpha_{52} \cdot \left(\frac{10^6}{RE}\right)^{0,75} + \alpha_{53} \quad [51]$$

3.3 Determination of the compressibility factor Z for the metered condition and the standard reference condition

To calculate the relative compressibility factor Z_r used to calculate the flow, it is necessary to successively calculate the compressibility factor for the two following conditions:

- Z = compressibility factor for the measured condition (under working conditions P , t)
- Z_{aga} = compressibility factor for standard reference condition (under p_{st} , t_{st})

where $p_{st} = p_N = 1.01325[\text{bar}]$ and $t_{st} = 15^\circ\text{C}$

To determine the compressibility factors Z and Z_{aga} , the same formulas and notations as those used for the partial valuation expressions shall be used, being necessary to solve twice the expressions, each time for different values of the parameters P and t .

Change of the values of the parameters P and t shall be made by using a program flag with two possible values:

- flag = 0 for the measured condition
- flag = 1 for the standard reference condition

Initially shall be taken into account flag = 0. Using the values of the parameters P and t for the measured condition obtained at points 3.2.1 and 3.2.11, the following values and expressions shall be calculated:

3.3.1. Modified pressure f_{p1} :

$$f_{p1} = f_{px} \cdot P + 0,0147 \quad [52]$$

3.3.2. Modified temperature f_{ti} :

$$f_{t1} = (0,0036 \cdot t + 0,984) \cdot f_t \quad [53]$$

3.3.3. The expression of f_{tx} :

$$f_{tx} = |1,09 - f_{t1}| \quad [54]$$

3.3.4. The expression of f_{t2} :

$$f_{t2} = f_{t1}^2 \quad [55]$$

3.3.5. The expression of f_{p2} :

$$f_{p2} = f_{p1}^2 \quad [56]$$

3.3.6. The correction coefficient w :

The correction coefficient w shall be calculated differently, according to the limits within which range the values for f_{pi} and f_{ti} , as follows:

a) if $0 < f_{pi} \leq 2$ and $1.09 \leq f_{ti} \leq 1.4$, then

$$w = 1 - 0,00075 \cdot f_{p1}^{2,3} \cdot e^{-20 \cdot f_{tx}} - 0,0011 \cdot w_h \cdot f_{p1}^2 \cdot (2,17 + 1,4 \cdot w_h - f_{p1})^2 \quad [57]$$

where w_h is

$$w_h = \sqrt{f_{tx}} \quad [58]$$

b) if $0 < f_{pi} \leq 1.3$ and $0.84 \leq f_{ti} \leq 1.09$, then

$$w = 1 - 0,00075 \cdot f_{p1}^{2,3} \cdot (2 - e^{-20 \cdot f_{tx}}) - 1,317 \cdot f_{tx}^4 \cdot f_{p1} \cdot (1,69 - f_{p2}) \quad [59]$$

c) if $1.3 < f_{pi} \leq 2$ and $0.88 \leq f_{ti} \leq 1.09$, then

$$\begin{aligned}
 w = & 1 - 0,00075 \cdot f_{p1}^{2,3} \cdot (2 - e^{-20 \cdot f_{tx}}) + 0,455 \cdot (200 \cdot f_{tx}^6 - 0,03249 \cdot f_{tx} + \\
 & 2,0167 \cdot f_{tx}^2 - 18,028 \cdot f_{tx}^3 + 42,844 \cdot f_{tx}^4) \cdot (f_{p1} - 1,3) \cdot (1,692 \cdot 2^{1,25} - f_{p2})
 \end{aligned}
 \tag{60}$$

3.3.7. The expression of m:

$$m = \frac{1}{f_{t2}} \cdot \left[0,0330378 - \frac{1}{f_{t1}} \cdot \left(0,0221323 - \frac{0,0161353}{f_{t2}} \right) \right]
 \tag{61}$$

3.3.8. The expression of f_{pm2} :

$$f_{pm2} = m \cdot f_{p2}
 \tag{62}$$

3.3.9. The expression of n:

$$n = \frac{1}{m} \cdot \left[\frac{1}{f_{t2}} \cdot \left(0,265827 + \frac{0,0457697}{f_{t2}} \right) - \frac{0,133185}{f_{t1}} \right]
 \tag{63}$$

3.3.10. The expression of b_w :

$$b_w = \frac{9 \cdot n - 2 \cdot m \cdot n^3}{54 \cdot f_{pm2} \cdot f_{p1}} - \frac{w}{2 \cdot f_{pm2}}
 \tag{64}$$

3.3.11. The expression of c:

$$c = \frac{3 - m \cdot n^2}{9 \cdot f_{pm2}}
 \tag{65}$$

3.3.12. The expression of d_w :

$$d_w = \left(b_w + \sqrt{b_w^2 + c^3} \right)^{\frac{1}{3}}
 \tag{66}$$

3.3.13. The expression of z_{rt} :

$$z_{rt} = \frac{0,00132}{f_{t1}^{3,25}} + 1
 \tag{67}$$

3.3.14. The compressibility factor Z_{aga} :

$$Z_{aga} = \frac{z_{rt}^2}{\frac{c}{d_w} - d_w + \frac{n}{3 \cdot f_{p1}}} \quad [68]$$

After solving the series of operations described in point 3.3.1 up to point 3.3.14, the flag value shall be tested and depending on this value, the following operations shall be performed:

- a) if flag = 0, after the calculation of the compressibility factor Z_{aga} for the measured condition:
 - its value shall be stored in a memory variable $Z:Z = Z_{aga}$
 - the values for the reference condition shall be assigned to the parameters P and t as follows: $P = 1.01325[\text{bar}]$ and $t = 15^\circ\text{C}$
 - the value 1 shall be assigned to flag :flag =1
 - the operations shall be resumed from 3.3.1 up to 3.3.14 to determine the compressibility factor Z_{aga} corresponding to the standard reference condition.
- b) If flag = 1, after the calculation of the compressibility factor Z_{aga} for the measured condition:
 - the operations from point 3.4 shall be made to calculate the relative compressibility factor.

3.4 Calculation of the relative compressibility factor Z_r

3.4.1. The relative compressibility factor Z_r is:

$$Z_r = \frac{1}{\sqrt{\frac{z}{z_{aga}}}} = \sqrt{\frac{z_{aga}}{z}} \quad [69]$$

where:

Z = compressibility factor for the measured condition

Z_{aga} = compressibility factor for the standard reference condition

3.5 Calculation of the hourly flow Q_h

3.5.1. Hourly Flow Calculation Method

To calculate the hourly flow is used the following formula:

$$Q_h = 0,21116526 \cdot \alpha \cdot \varepsilon \cdot de^2 \cdot \frac{1}{\sqrt{\rho_s}} \cdot z_r \cdot \sqrt{\frac{P \cdot H}{t+273,155}} \quad [70]$$

If the partial formula [44], noted with Q_{fixed} , already solved in point 3.2.20, is taken into account, it appears that the calculation formula [70] for the hourly flow becomes:

$$Q_h = Q_{\text{fix}} \cdot \varepsilon \cdot z_r \cdot \alpha \quad [71]$$

If we use the following notation:

$$Q_{\text{fx}} = Q_{\text{fix}} \cdot \varepsilon \cdot z_r \quad [72]$$

then, the hourly flow becomes

$$Q_h = Q_{\text{fx}} \cdot \alpha \quad [73]$$

Because the hourly flow Q_h is calculated depending on α , which depends on RE which, on its turn is a function depending on Q_h , the hourly flow can not be determined directly, being the result of successive approximations only. By an iterative calculation carried out in more than one steps ($i = 1, 2, \dots, n$), a series of values of the hourly flow Q_h shall be valuated by carrying out the necessary successive approximations by calculating the related errors, until the value of Q_h shall range within the limits pre-set at the beginning of the iterative calculation.

In order to obtain an as higher as possible accuracy, an initial very small value shall be initially established for the maximum accepted error, according to the following formula:

$$\delta Q_{\text{prest.}} = 10^{-5} [\text{Sm}^3] = 0,00001 [\text{Sm}^3] \quad [74]$$

3.5.2. Determination of the hourly flow by successive approximations

In the first approximation (step 1), Q_{fixed} is evaluated and Q_h is calculated by using the formula [70] where α has the value calculated in point 3.2.22 corresponding to $RE = 10^6$ as established initially, when beginning the calculations from point 3.1, to Q_1 and RE being assigned the initial values ($Q_1 = 0$ and $RE = 10^6$).

3.5.2.1 Q_{fx} be evaluated using the formula:

$$Q_{\text{fx}} = Q_{\text{fix}} \cdot \varepsilon \cdot z_r \quad [75]$$

3.5.2.2. Q_h shall be calculated using the formula:

$$Q_h = Q_{fx} \cdot \alpha \quad [76]$$

3.5.2.3. Determination of ΔQ , the calculated flow error:

The error ΔQ represents the absolute difference between the two successive values of the hourly flow obtained by iterative calculation, compared to the prior approximation step:

$$\Delta Q = |Q_h - Q_1| \quad [77]$$

3.5.2.4. Check the range within the pre-set accuracy range:

The error ΔQ shall be compared with the maximum accepted error δQ_{preset} . According to the result of this comparison, the following operations shall be carried out:

- a) if $\Delta Q < \delta Q_{\text{preset}}$, the approximation operation ends, the last Q_h calculated value remaining final and ranging within the calculation accuracy range pre-set. In this moment, the operation from point 3.6 shall be made, to calculate the daily flow.
- b) if $\Delta Q > \delta Q_{\text{preset}}$, the approximation procedure continues, passing to the next step and carrying out the operations

3.5.2.5. Q_1 shall be replaced by the value of Q_h , thus,

$$Q_1 = Q_h \quad [78]$$

3.5.2.6. The value of RE shall be recalculated as:

$$RE = Q_1 \cdot RE_{fx} \quad [79]$$

3.5.2.7. Correction of the flow coefficient α according to the new recalculated value of RE:

The flow coefficient α shall be recalculated according to the type of the primary element (t_e), using the formulas described in point 3.2.22.

3.5.2.8. Resuming the operations starting with point 3.5.2.2., using this time the new recalculated value of the flow coefficient α

3.6 Daily Flow Calculation

The daily flow shall be determined in the last phase of the calculation procedure, according to the type of the daily metering, on the basis of the hourly flow calculated separately for each set of devices used and of the duration of the metering made with the relevant set of devices.

If the most complex case ($timz = 3$), where daily metering has been carried out with two different sets of devices (Devices Set 1 and Devices Set 2), during two different moments of the day ($oref_1$ and $oref_2$), is taken into consideration, then based on the two hourly flows (Q_{h1} and Q_{h2}), separately calculated for each of the two sets of devices used, shall be determined the daily partial flows (Q_{z1} and Q_{z2}) for the relevant moments of the day, following then to calculate the daily overall flow Q_{ztot} by summing the two daily partial flows.

3.6.1. The daily partial flow calculated for the metering carried out during $hourf_1$, by using the Devices Set 1 is:

$$Q_{z1} = Q_{h1} \cdot oref_1 \quad [80]$$

3.6.2. The daily partial flow calculated for the metering carried out during $hourf_2$, by using the Devices Set 2 is:

$$Q_{z2} = Q_{h2} \cdot oref_2 \quad [81]$$

3.6.3. The daily overall flow shall represent the sum of these two daily partial flows:

$$Q_{ztot} = Q_{z1} + Q_{z2} \quad [82]$$

4. Storage of the Calculated Daily Flows

The calculated daily flows are stored separately in 12 monthly files: DGAS01 – DGAS12. A record is provided for each metering point within each monthly file which, by its field structure, ensures the separate storing of the calculated daily flows for each day of the relevant month, as



well as of the corresponding cumulated flows. The record has 31 distinct fields to store the daily flows in a month and 31 distinct fields to store the corresponding cumulated flows in the month. In this manner the necessary space to store the daily and cumulated flows in one year is ensured.



Annex 10

(to The Network Code for the National Natural Gas Transmission System)

No	Tariff	Unit
Tariff for Transmission in the NTS (TT)		
1	a. for transmission services through the NTS with capacity booking (TFT):	
	- fixed component for booking the necessary capacity for firm services - volumetric component	MWh and booking hour MWh transmitted
	b. for interruptible transmission services through the NTS (ITT):	
	- fixed component for the reservation of the capacity for interruptible services - volumetric component	MWh and booking hour MWh transmitted
Nomination Non-compliance Tariff (NNT)		
2	3% < Difference between the allocation and the approved nomination ≤10%	for each MWh/day within the interval
	10% < Difference between the allocation and the approved nomination ≤20%	for each MWh/day within the interval
	Difference between the allocation and the approved nomination > 20%	for each MWh/day within the interval
Tariff for exceeding the booked capacity (RCET)		
3		for each MWh/day exceeded
Tariff for supply under nomination (SNT)		
4	3% < Difference between the supply and the approved nomination ≤10%	for each MWh/day not supplied within the interval
	10% < Difference between the supply and the approved nomination ≤20%	for each MWh/day not supplied within the interval

	Difference between the supply and the approved nomination > 20%	for each MWh/day not supplied within the interval
5	Tariff for supply under booked capacity (RCST)	
		for each MWh/day not supplied
6	Tariff for daily unbalance (DIT)	
	A	Lei
	B	Lei
	C	Lei
7	Tariff for accumulated unbalance (AIT)	
	L	Lei/MWh
	M	Lei/MWh
	N	Lei/MWh
	O	Lei/MWh
	P	Lei/MWh
	Q	Lei/MWh
	R	Lei/MWh
	S	Lei/MWh
	T	Lei/MWh
	U	Lei/MWh

The values of the above mentioned tariffs are approved by the Order of CA President and are published in the Romanian Official Journal, Part I.



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The Network Code Of The National Gas
Transmission System - updated on 28
December 2011
(This version shall enter into force as of 1 April
2012.)

Annex 11 — Invoicing Procedures¹⁶

¹⁶Annex 11 is abrogated.

Traducere:
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