

BALANCING

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9.1 PREMISE

This Chapter describes the management procedures for balancing operations, whose approach reflects current Transmission Network characteristics and is aimed at ensuring the safe and orderly system operation, as well as the correct allocation of costs to Shippers.

Balancing is a key concept for the operation of the Gas system, and has a two-fold meaning:

- **"physical balancing"** of the system denotes all operations performed by the Transmission System Operator to control flow parameters (gas flow rate and pressure) in real time via its Dispatching, in order to ensure the safe and efficient transmission of Gas from Entry to Redelivery Points at any time;
- **"commercial balancing"** means all activities necessary to correctly account for and allocate the transmitted Gas, as well as the fee structure that motivates Shippers to maintain the balance between the quantities of gas input into and taken off from the Network, and, thus, to assist the Transmission System Operator in its physical balancing activity.

9.2 PHYSICAL BALANCING

Article 8.6 of the Legislative Decree defines the Transmission System Operator's responsibilities with respect to the physical balancing of the Network it manages. The Transmission System Operator is obliged to operate the Network in a technically compliant manner, but it does not own the Gas it transmits and neither does it control the quantities made available or taken off by Shippers at Entry or Exit Points. In short, the Transmission System Operator may remedy (only within certain limits) unbalanced gas conditions generated by Shippers, who are thus motivated to comply with balancing thanks to an appropriate fee structure.

Moreover, within the framework of a daily balancing regime, the Transmission System Operator provides Shippers with a time-based adjustment service - concurrently and as an integral part of the transmission service - that is necessary handle hourly variations of Network Gas off-takes that normally occur

during the Gas-day. In order to manage network line-pack variations, provide the time-based adjustment service and optimise the management of network assets both as far as planning and during the Gas-day, the Transmission System Operator purchases adequate storage capacity from Storage Companies (both in terms of space/volume and daily peak deliverability).

With respect to the above, in order to ensure the physical balancing of the Network and pursuant to the Network Code, the Transmission System Operator accesses the allocated storage capacities and, where needed, by liaising with the Leading Company, also the available capability purchased by Shippers at storage facilities.

In light of the above, the Transmission System Operator, notwithstanding the provisions of Paragraph 18.2.1 "Parties' Liabilities", shall not be held liable for any possible technical and/or economic consequences borne by the Shippers and resulting from the physical balancing activities performed by the Transmission System Operator within the scope of aforementioned the general and specific guidelines.

9.3 COMMERCIAL BALANCING

9.3.1 *Premise*

Since the National Network transmission service is mainly carried out on the Leading Company's Network, the Shipper's overall balance equation is calculated by the Leading Company, as set out in its Network Code, by using information provided by the Transmission System Operator to the Leading Company and in line with the provisions of the Chapter on "Operational coordination".

Thus, it is important to refer to the provisions of the Leading Company's Network Code for temporary and final daily allocations, balances and variations.

In line with this document, the Gas quantities that may be input into or taken off from the Transmission Network shall be expressed in energy units - GJ, equivalent to 10^9 joules - obtained from the product of the volume measured (for its definition, see the "Gas Measurement" Chapter) and the Gross Calorific Value (PCS, as defined at Sub-paragraph 11.2.1 of the "Gas Quality" Chapter).

9.3.2 Transmission Network balance equation

As already described in the "Network and Network management description" Chapter, since the Transmission System Operator manages the part of the National Network it owns from an operational, but not from a contractual viewpoint, and given that such part is interconnected with the system managed by the Leading Company, the balance equation for the entire network is used to provide the Leading Company with the information needed to determine the balances for each Shipper, other than acting as the reference point for physical balancing.

The Network equation is:

$$I = IN + C + PE + \Delta LP_C + GNC$$

Network inputs (I)

The energy input into the Transmission Network of the Transmission System Operator is the sum of the quantities input by Shippers and the Transmission System Operator at the RN Entry Points.

The overall energy input at the RN Entry Points is determined through the facilities that supply MG measurements, for which provisional data are available on a daily basis, to be subsequently validated at month end.

Gas flow through the Redelivery/Delivery Point to/from the Leading Company (IN)

The energy taken off the Transmission Network is the sum of the quantities that have flown through the interconnections with the Leading Company's system (positive for an exit flow and negative for an entry flow).

The overall energy input/taken off at these interconnection Points is determined by the facilities that supply MG measurements, for which provisional data is available on a daily basis, to be subsequently validated at month end.

Consumption (C)

The energy taken off by the Transmission System Operator with respect to the consumption of its own compression stations is calculated as the sum of products of daily measured volumes and relevant PCS for all compression stations on the Transmission System Operator's Gas pipeline.

Line-pack (ΔLP_C)

The line-pack is the difference between the energy available in the Network at the beginning of the Gas-day and the amount present at the same time on the following Gas-day.

The line-pack delta of the Network on the Gas-day is determined by measuring the pressure for the Network's most important tranches.

The volume determined according to the following procedure is multiplied by the PCS of the RN Entry Point, in order to also express the ΔLP in energy units.

The calculation shall determine:

- the Network's geometric volume;
- pressure measurements at key system points;
- the product of pressure variation and the associated geometric volume.

Losses (PE)

The term PE represents Gas losses, such as:

- leakage from control valves (calculated using a statistical certified method);
- preheating Gas from reduction devices;
- compression stations' vents;
- Gas losses due to maintenance works on the Network;
- localised losses;

Calculation procedures adopted by Transmission System Operator to estimate:

- Gas losses due to pipeline breaks;
- Gas losses due to works, such as commissioning of a new pipeline tranche

are summarised below.

In the first case, the volume of the Gas leak shall be determined on the basis of the pipeline's cross-section, the operating pressure of the portion of the pipeline involved in the leakage, the size of the leakage (break cross-section) and the duration of the Gas leak.

This volume is linked to the PCS of the RN Entry Point, in order to express the Gas leak in energy units.

In the event of works-related Gas leaks on complete line-packs of a pipeline tranche, the volume shall be determined by measuring the pressure at which the line-pack has been performed and the physical volume of the pipeline involved. In the event of partial line-packs on the affected pipeline, the residual pressure at the end of the works shall also be taken into account.

Unaccounted-for-gas (GNC)

The term "Unaccounted-for gas ("GNC")" is the result of the Network balance equation: it represents non-determinable energy due to measurement uncertainties and, therefore, may have a positive or negative value.

The Transmission System Operator calculates the GNC rate pertaining to the Transmission Network. The Leading Company calculates the total GNC for the national through the balancing equation defined in the Network Code. The GNC, as calculated and allocated to Shippers by the Leading Company, includes the Transmission System Operator's GNC.

The Transmission System Operator shall notify the values of the terms of the balance equation detailed in this Paragraph, which the Leading Company needs to calculate the RN balance equation.

9.3.3 Shipper's delivery and redelivery balance on the Transmission Network

With respect to the Shipper's balance equation, this is limited to the equivalence between the energy delivered to the Entry Points on RN and the energy redelivered to the Leading Company at Redelivery Points.

9.4 MEASUREMENT BALANCING

Any measurement error (both under- and over measurements), shall result in the balancing of the incorrectly determined energy quantities.

In the event of verified errors, the Transmission System Operator shall substitute the wrong value with the correct one.

Every month M, the Transmission System Operator shall define the values for the month M-1 and, and at the same time, the review of the data pertaining to month M-3.

Once the aforementioned review procedure has been implemented, the measurement values shall be notified and considered as final.