

PRESSURE CONTROL AND PRESSURE SAFETY

1. General description

Exhibit C describes the pressure safeguarding in relation to the technical integrity of the connection of the facilities of <NNO> at ... to the gas transmission grid of GTS.

<NNO> and GTS will operate their Facilities as an open grid for bi-directional flow. The delivery from the gas transmission grid of GTS to the facilities of <NNO> is "Forward Flow" (Exit) and the delivery in opposite direction is "Reverse Flow" (Entry).

<NNO> is responsible for the pressure control and pressure safeguarding at the <NNO> location ... in the reverse flow direction. <NNO> will operate their pipeline at a pressure lower than or equal to the Maximum Operating Pressure (MOP_{<NNO>}) of ... bar(e).

GTS is responsible for the (passively acting) pressure control at the GTS location ... in the forward flow direction. GTS will operate their system at a pressure lower than or equal to the Maximum Operating Pressure (MOP_{GTS}) of ... bar(e).

GTS reserves the right to increase the MOP of the system up to 79.9 bar(e) at the interconnection point upon a written notice of at least 12 months in advance of the date of increase of the MOP of the system.

The actual pressure safeguarding devices and settings are stored in the Pressure Safeguarding Diagram (PSD-drawing ... ; see section 7).

Both Parties have to install and maintain pressure control and pressure safeguarding facilities at their own location.

2. Design standards

The pressure control and pressure safety systems shall be in compliance with the following European and governing national standards:

- a) EN 12186, Gas supply systems – Gas pressure regulating stations for transmission and distribution – Functional requirements (Edition February 2000);
- b) EN 1594, Gas supply systems - Pipeline for Maximum Operating Pressure over 16 bar - Functional requirements (Edition March 2009);
- c) NEN-EN-IEC 61508-5, Functional safety of electrical/electronic/programmable electronic safety related systems, Part 5: examples of methods for determination of Safety Integrity Levels (SIL) (Edition 2010);
- d) NEN-3650-1 (Dutch part), Requirements for pipeline systems – Part 1: General. Quire 1: Chapter 1 up to and including 7 (Edition July 2003);
- e) Arbeitsblatt G 463 (Edition December 2001);
- f) VdTÜV 1063, Berechnung der Wanddicke von Stahlrohren gegen Innendruck.

3. Gas transmission grid/pipeline

Design specification:

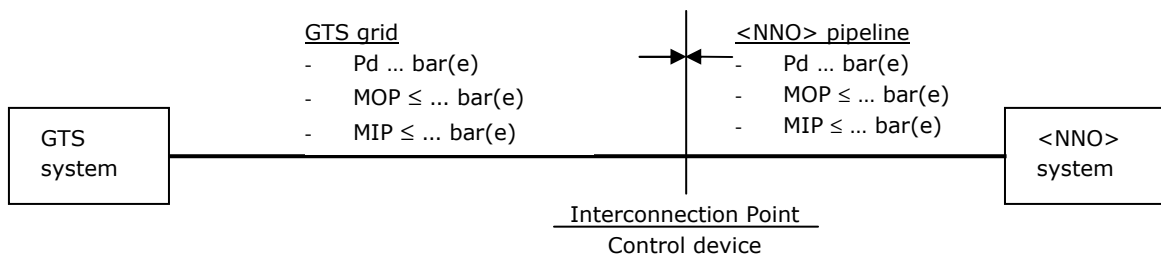
- <NNO>:
The Gas Transmission pipeline (number ...) of <NNO> at ... is designed for a pressure of ... bar(e) (system temperature between -20°C and +50°C). The <NNO> pipeline will be operated at a Maximum Operating Pressure ($MOP_{<NNO>}$) lower than or equal to ... bar(e). Taking into account this MOP, the operating pressure of the gas at the interconnection point shall in case of reverse flow be sufficient to allow the gas to enter the GTS system.
- GTS:
The gas transmission grid of GTS at ... is designed for a pressure of ... bar(e) (system temperature between -20°C and +50°C). The gas transmission grid of GTS will be operated at a Maximum Operating Pressure (MOP_{GTS}) lower than or equal to ... bar(e).

The maximum delivery pressure at the Interconnection Point is agreed at ... bar(e). Conform the deterministic approach of the Dutch Design Standard NEN-3650-1 no safety device is necessary at the Interconnection Point when the Maximum Operating Pressure upstream is lower than or equal the maximum incidental pressure downstream. To accommodate this the Maximum Operating Pressure of the gas transmission grid of <NNO> is agreed on lower than or equal to ... bar(e) ($115\% \times MOP_{GTS} = \dots \text{bar}(e)$).

Pressure devices and their settings:

The design of the pressure control and pressure safety systems is conform the deterministic approach of the Dutch Design Standard NEN-3650-1. The level of settings of the pressure control and pressure safety systems is based on the lowest Maximum Operating Pressure in the gas transmission grid in the system. In this case the GTS gas transmission grid with a MOP of ... bar(e).

- <NNO>
 - a) The pressure (override) control shall be lower than or equal to MOP of ... bar(e).
 - b) The pressure safety device shall have a set point lower than $115\% \times MOP = \dots \text{bar}(e)$, taking into account the inaccuracy and the dynamics of the pressure safety system. The setpoint of the Safety Shutdown Valve shall be lower than $113\% \times MOP = \dots \text{bar}(e)$.
- GTS
 - a) The pressure (override) control shall be lower than or equal to MOP of ... bar(e).



The actual pressure safeguarding devices and settings are stored in the Pressure Safeguarding Diagram (PSD-drawing, see section 7).

Both Parties are responsible for preventing a higher pressure than the Maximal Incidental Pressure (MIP) of the gas transmission grid. The pressure in the gas transmission grid of both Parties may never exceed the Maximum Incidental Pressure (MIP).

4. Reliability and Maintenance of the pressure safety systems

The safety-performance shall be checked by periodic functional testing. The results of which must be documented and be available for each party on request. The extent and frequency of maintenance and testing shall be in accordance with the above-mentioned standard NEN-3650-1 and the applicable procedures valid in the country of installation.

5. Exchange of information

- a) Before starting operation of the transmission of Gas, <NNO> and GTS shall exchange P&ID's (Process & Instrumentation Diagrams) showing all relevant control loops and safety systems with the actual settings,
- b) <NNO> shall hand over to GTS the test results of the initial test and the yearly tests of the safety systems on the <NNO> facilities at ...,
- c) Both Parties agree with exchanging pressure safeguarding information on request of one of the Parties,
- d) Both Parties are allowed to witness inspections of any part of the pressure safeguarding system,
- e) GTS will perform a yearly audit of the performed maintenance on the pressure safeguarding system,
- f) <NNO> shall issue an invitation to GTS to witness the yearly test of the pressure safeguarding system,
- g) Prior to putting out of service by either <NNO> or GTS of the pressure control and/or pressure safety system both Parties have the obligation to inform the other Party.

6. Modifications

Prior to any intended modification by either <NNO> or GTS of the pressure control and/or pressure safety system, both Parties have to agree upon the proposed modification, including an exchange of all relevant updated drawings.

7. Pressure Safeguarding Diagram

The actual pressure settings at the <NNO> facilities and at the GTS location ... are stored in the Pressure Safeguarding diagram (PSD- drawing: ...). The Pressure Safeguarding Diagram is part of the contract between <NNO> and GTS. Both Parties shall hold a copy, signed as agreed by both Parties.

GTS is responsible for drawing and updating the Pressure Safeguarding Diagram.

(PSD to be inserted here)