

# **GUIDELINES**

**of Gasunie Deutschland  
Transport Services GmbH**

**for planning, setting up  
and operating  
a grid connection**

**(valid from 01.07.2008)**

**gasunie**

## 1. General

**1.1** These guidelines replace the "Richtlinien für den Bau und Betrieb von Erdgasübernahmestationen mit einem Eingangsdruck von mehr als 16 bar" of GUD, and shall now be used instead.

**1.2** These guidelines are applicable to the technical facilities in a grid access point (as defined by the DVGW worksheet G 2000) for handling tasks relating to transport.

**1.3** In accordance with these guidelines,

- the grid access point partner is responsible for
  - planning, setting up and operating the measurement and control system (M&C system)
- GUD is responsible for
  - planning, setting up and operating the supply-side connection pipe.

**1.4** The M&C system and the connection pipe shall be planned, set up and operated according to the relevant applicable statutory provisions and the generally recognised rules of technology, in particular in accordance with DVGW worksheets and the DIN standards as well as the technical memoranda of the DVGW (see Appendix); the manufacturer's instructions shall be observed.

If compliance with certain national technical rules is demanded in these guidelines, this does not mean that the technical rules of other EU member states are thereby excluded, providing these offer a technical solution that is at least of an equivalent level of safety.

Furthermore, these guidelines shall be observed.

**1.5** The grid access point partner shall consult with GUD regarding the planning and setup of the M&C system.

GUD shall define the take off of the connection pipe on the GUD transport pipe system for the planned M&C system.

In good time before placement of the order, the grid access point partner shall present GUD with triplicate copies of the planning documents relating to the set up of the M&C system and other technical documentation – referred to under the general terms of "documents" below – showing the details, in particular the location, configuration, function and technical layout. Modifications and additions to the documents shall also require approval.

The approval is to be granted if the documents are in accordance with these guidelines as well as additional relevant conditions and other agreements with GUD, e.g. conclusion of a grid coupling or grid connection contract.

Approval by GUD of the documents as well as of modifications and additions to the documents shall be given in writing in order to be effective.

**1.6** The grid access point partner and GUD may employ third parties in order to undertake tests that are required as part of these guidelines, providing these parties can demonstrate they possess the required qualifications.

**1.7** The grid access point partner shall ensure that delegates of GUD are granted access to all systems and facilities of the grid access point partner to which these guidelines apply, as well as to the additional facilities in accordance with section 4.10.

**1.8** These guidelines also apply to expansions or modifications to the M&C system. The grid access point partner shall consult with GUD regarding the planning and implementation of expansions or modifications in good time before the work is performed, in accordance with section 1.5.

## 2. Ownership and costs

**2.1** The grid access point partner is the owner of the M&C system.

GUD is the owner of the connection pipe to the extent described in section 3 as well as the additional facilities in accordance with section 4.10.

**2.2** The grid access point partner shall plan, set up and operate the M&C system at its own expense, and shall be responsible for the manufacturing costs of the connection pipe to the extent described in section 3.

GUD is entitled to install and operate additional facilities at its own expense. To this extent, GUD is also responsible for the costs of installing the additional facilities in accordance with section 4.10.2.

**2.3** The line of ownership between the connection pipe and the M&C system is the station-side weld of the insulating piece or the weld directly after the last shut-off device of GUD prior to the M&C system, unless agreed otherwise in the grid coupling or grid connection contract.

**2.4** The transition point for the natural gas to be transported is the line of ownership stated in section 2.3.

**2.5** Operation including maintenance of the M&C system is to be performed by the grid access point partner at its own expense and under its own responsibility.

Maintenance of the connection pipe to the extent described in section 3 up to the line of ownership, as well as the additional facilities in accordance with section 4.10, is performed by GUD at its own cost and under its own responsibility.

## 3. Connection pipe

**3.1** The connection pipe connects the transport pipe system of GUD to the M&C system of the grid access point partner. The connection pipe is always a high-pressure pipe in accordance with the

regulations governing high-pressure gas pipes (GasHL-VO).

The outgoing pipe from the transport pipe system and the connection pipe are planned according to the GUD standard and shall always have a diameter of at least DN 100.

A telecommunications cable is laid with the connection pipe.

**3.2** A shut-off valve in the connection pipe is always equipped with an actuator to be operated by GUD under remote control and a bypass pipe. The installation location of this shut-off valve is defined by GUD.

The minimum distance between this shut-off valve and the M&C system is 15 m. The grid access point partner shall enable GUD to install the shut-off valve including the bypass pipe, as well as the associated facilities, on the property where the M&C system is located.

**3.3** The connection pipe is included in the cathodic corrosion protection of the transport pipe system of GUD, and is electrically isolated from the systems of the grid access point partner. A measurement station is set up on the property where the M&C system is located, in order to test the insulation piece and the pipe/earth potential.

**3.4** The telecommunications cable laid together with the connection pipe during its construction is routed to a protective enclosure of GUD in the area of the shut-off valve in accordance with section 3.2. A linking telecommunications cable is routed to the M&C system from here onwards.

Furthermore, the protective enclosure is also used for installing the remote control and switching system for the remotely operated actuator and the connection of the power utility for the electrical facilities operated by GUD on the property where the M&C system is located.

Erection of a protective enclosure by GUD can be dispensed with if the grid access point partner provides another suitable accommodation option on the property where the M&C system is located, taking account of the requirements in section 3.4 and subject to the requirement that it is located at a safe distance from the installation site of the gas pressure control and measurement system.

#### **4. Structure of M&C systems**

All M&C systems consist of:

- 4.1 Station building
- 4.2 Dust and liquid separator
- 4.3 Natural gas pre-heating system
- 4.4 Safety facilities
- 4.5 Gas pressure control system
- 4.6 Acoustic protection measures / flow rectifier
- 4.7 Measurement system
- 4.8 Odourisation system

#### 4.9 Electrical power supply system

##### 4.10 Additional facilities

The individual sub-systems or equipment groups of the pipe system shall be separated from one another by shut-off devices.

All components, system parts and equipment installed in the M&C system shall be designed for the corresponding operating conditions – including with regard to their materials – offer a high level of serviceability and function reliably under the given environmental influences. The dimensions of these components shall be selected with regard to the general technical conditions, e.g. minimum and maximum gas flow rates, minimum and maximum supply pressure, gas composition, etc. as agreed in the grid connection contract.

The gas speed in the pipelines of the M&C system should not exceed the value  $v = 20$  m/s.

#### **4.1 Station building**

The technical facilities of the M&C system, in particular the measurement system, shall be housed in a building or, under exceptional circumstances, in a suitable enclosure, the size of which is sufficient for the maintenance and inspection measures that have to be performed.

#### **4.2 Dust and liquid separator**

The gas shall be passed through suitable filters and separators in order to protect the downstream technical systems against dust and moisture. The differential pressure of a dust and moisture separator that is dictated by the design is not allowed to exceed the manufacturer's specifications. The dust and moisture separators shall be equipped with a differential pressure gauge in order to allow the level of contamination to be checked regularly.

The dust and moisture separator shall be monitored for a build-up of fluid. If there is an automatic discharge feature, a separate container with sufficient collection volume shall be provided.

#### **4.3 Natural gas pre-heating system**

A sufficiently sized natural gas preheating system shall be provided on the supply pressure side if hydrate formation, hydrocarbon condensation or icing is to be expected when the pressure is reduced.

The gas temperature on the gas meter should not fall below the value  $t = + 5$  °C. The temperature fluctuation that is a feature of the control system is not allowed to deviate from the set nominal value by more than  $\Delta t = 2$  °C.

The natural gas preheating system shall be set up in accordance with DVGW code of practice G 499. Furthermore, the heat exchangers shall be in accordance with the requirements of DVGW worksheet G 498.

#### 4.4 Safety facilities

The M&C system shall be equipped with safety facilities in accordance with DVGW worksheet G 491 in order to prevent the maximum permitted pressure in the pipe system connected after the grid access point from being exceeded.

**4.4.1** The requirements of DVGW worksheet G 491, specifically section 6.1.3, shall be adhered to when selecting and setting the safety facilities.

**4.4.2** The requirements of DVGW worksheet G 491, specifically sections 5.5.2 to 5.5.8 and 6.4, shall be adhered to in the planning and implementation of the function pipes associated with the safety facilities. The requirement of DVGW worksheet G 496 section 2.12.1 does not apply to M&C systems.

**4.4.3** If no transports take place in downstream pipe systems from time to time, additional safety blow-off facilities in accordance with DVGW worksheet G 491 section 7.1.8 shall be provided in order to remove any leakage gas build-ups.

#### 4.5 Gas pressure control system

In the gas pressure control system, the operating pressure present in the transport pipe system of GUD before the M&C system is reduced to the necessary operating pressure of the pipe system connected after the grid access point.

Multi-train gas pressure control systems are recommended in order to increase the operating safety of the gas pressure control system, and to simplify test and maintenance work.

#### 4.6 Noise protection measures/flow rectifier

Additional measures may be required in order to comply with acoustic limit values and to avoid disruptive noise emissions.

Vibration and pulsation can be reduced by installing technical facilities that are optimised to the particular application.

#### 4.7 Measurement system

##### 4.7.1 General

The measurement system is used for ascertaining the quantities of heat (thermal energy) transferred in the grid access point from the transport pipe system of the upstream grid operator into the transport pipe system of the downstream grid operator or into the pipe system of the grid connection consumer. The measurement instruments used shall be calibrated and sealed by a calibration authority.

The grid access point partner and GUD shall define the equipment of the measurement system according to the expected gas flow rate and on the basis of the grid coupling or grid connection contract. The measurement system shall be equipped at least to the following extent:

#### Installation of a measurement system

	Gas flow rate ( $V_n$ )		
	$\leq 5,000$ $m^3/h$	$> 5,000 - 100,000$ $m^3/h$	$> 100,000$ $m^3/h$
<b>1. Gas volume measurement system</b>			
1.1 One measurement train with one gas meter	X		
1.2 Main and reserve measurement train with one gas meter and series connection possibility each *)		X	
1.3 Main and reserve measurement train, each with two gas meters of different design in continuous series connection			X
<b>2. Gas composition measurement system **)</b>	X	X	X
<b>3. Measurement data registration unit</b>	X	X	X

\*) see section 4.7.2.4

\*\*\*) see section 4.7.3.2

#### 4.7.2 Gas volume measurement system

**4.7.2.1** The gas volume measurement system shall feature calibrated gas volume measurement instruments, calibrated quantity converters for converting to the normal status and calibrated measurement data registration equipment that continuously meter and register the transported gas quantities in  $m^3 (V_n)$ .

**4.7.2.2** The design of the gas volume measurement system shall ensure that the minimum and maximum gas flow rate expected for the M&C system, including the inherent consumption of the M&C system, does not deviate from the permitted measurement range of the gas volume measurement system. The measurement instruments shall be installed so that the greatest possible measurement accuracy and a high level of serviceability are assured. Influences specific to the system, e.g. disrupted flow profile, pulsation, vibration, etc. shall be eliminated as far as possible by suitable technical measures.

Gas meters with a restricted calibration limit are to be used in accordance with DIN 33800.

**4.7.2.3** Each gas meter in a gas volume measurement system shall be equipped with a quantity converter to take account of the real gas behaviour so that a quantity calculation can be made without a correction procedure in accordance with DVGW worksheet G486 section 5.

The selection of the conversion procedure shall be agreed with GUD, in which case the possible fluctuations of the measurement pressure, the measurement temperature and the gas composition are to be taken into account.

If the measurement system continuously measures the gas composition, calorific value quantity

converters shall be used for the quantity conversion.

The calculation of the compressibility number  $K$  shall be performed for the status quantity converter in accordance with the procedure described in DVGW worksheet G 486 with regard to the requirements of PTB technical directive G 9. In the case of gas composition ranges not regulated in the above document, the compressibility number shall be determined in accordance with other procedures approved by the PTB.

The gas composition input parameters for the quantity converter shall be calculated and defined by GUD in accordance with DVGW worksheet G 486 sections 5.1 and 5.2.

**4.7.2.4** The gas volume measurement system for an expected gas flow rate of  $V_n > 5,000$  to  $100,000 \text{ m}^3/\text{h}$  shall consist of at least one main and one reserve measurement train. The reserve measurement train shall start operation if the main measurement train fails or is recalibrated, and shall undertake its function.

The trains shall be constructed so that both measurement trains can be connected in series for monitoring purposes without impairing measurement accuracy to an impermissible extent.

If gas meters working according to different measurement procedures are integrated in the main and reserve measurement trains, the reserve measurement train may also undertake the function of a monitoring measurement train subject to agreement between the grid access point partner and GUD. Both gas meters shall then be continuously operated in series.

The gas volume measurement system for an expected gas flow rate of  $V_n > 100,000 \text{ m}^3/\text{h}$  shall consist of several measurement trains, each with a main and monitoring measurement facility. The gas meters installed in each measurement train operate using different physical measurement processes. They are to be arranged with the necessary fault-free inflow and outflow trains on the same plane and without deflections, and operated continuously connected in series.

The grid access point partner and GUD shall define which measurement train is used as the main measurement train and which as the reserve measurement train. Furthermore, they shall define which gas meter in measurement trains with two gas meters shall be used as the main meter and which as the monitoring gas meter.

If a gas volume measurement system is provided with a bypass pipe/Z-circuit, it shall be equipped with a shut-off valve that is gas-tight and not susceptible to dirt. It shall be possible to seal this in the closed position. Two shut-off valves are to be provided if it is not possible to check the gas-tightness of this shut-off facility once it has been installed, and a pressure gauge shall be provided

in between the two shut-off valves in order to check for leaks.

Facilities are to be provided for filling and emptying the measurement trains in order to prevent damage to the gas meters due to overload.

**4.7.2.5** Additional connections for recording the measurement temperature and measurement pressure as well as another connection for taking samples in order to check the gas composition shall be provided for checking the gas volume measurement system.

#### **4.7.3 Gas composition measurement system**

**4.7.3.1** The grid access point partner shall install a calibrated gas composition measurement system in accordance with DVGW worksheet G 488 in the M&C system.

**4.7.3.2** At the request of the grid access point partner, GUD shall check whether and for what period a reference gas composition can be provided. On the basis of an agreement to be concluded between the grid access point partner and GUD, GUD may not insist on the installation of a calibrated gas composition measurement system by the grid access point partner, in such a case.

**4.7.3.3** Prior to commissioning of a new gas composition measurement system, the manufacturer shall perform a works function test in the presence of GUD, as part of which the specified measurement requirements are checked using certified calibration gases and an analysed natural gas (test gas) that is similar to the subsequent measurement conditions.

A permanent supply of this test gas shall be maintained by the grid access point partner for subsequent regular measurement instrument inspections at the location where the gas composition measurement system is installed.

**4.7.3.4** The gas composition measurement system shall be set up and operated in a room that is exclusively used for measurement and gas analysis purposes, as well as complying with the requirements of the PTB and DVGW worksheet G 488.

**4.7.3.5** Measures shall be taken to ensure that the electrical measurement value outputs approved by the PTB for transport subject to calibration are available to GUD for further processing of the measurement signal.

#### **4.7.4 Measurement data registration**

The measurement data registration device is used for recording the significant measurement data in order to calculate the quantities of heat.

The grid access point partner shall install a measurement data registration device that can be calibrated and shall provide the necessary measurement data in a format that is suitable for GUD to download it directly.

For this purpose, the grid access point partner shall install and maintain a telecommunications connection with an outside train or a remote data transmission facility of equivalent quality.

#### **4.8 Odourisation system**

If an odourisation system is provided in accordance with DVGW worksheet G 280, this shall be installed separately from the other facilities of the M&C system. The odourising agent shall be administered at the output of the pressure control and measurement system in accordance with the flow rate. Odourisation is recommended for industrial applications.

#### **4.9 Electrical power supply system**

All electrically operated equipment required for measurement, recording and registration for the purposes of settlement as well as all such equipment necessary for trouble-free operation of the M&C system shall be connected to an uninterruptible power supply (UPS) system.

The grid access point partner shall enable GUD to connect GUD's own additional facilities installed in the M&C system in accordance with section 4.10 to the UPS system and operate them on this system free of charge.

#### **4.10 Additional facilities**

**4.10.1** GUD is entitled to install and operate additional facilities, in particular measurement, registration and transmission facilities. The grid access point partner shall provide suitable rooms for this free of charge.

**4.10.2** GUD is entitled to install and operate additional gas volume and gas composition measurement systems on the property where the M&C system is located, for control purposes.

**4.10.3** GUD is entitled to modify or dismantle the additional facilities at any time subject to prior notification being given to the grid access point partner.

#### **5. Commissioning/start-up of gas transports**

**5.1** In good time before commissioning of the M&C system, GUD shall be given the opportunity to test whether the M&C system has been erected as agreed. In the event that deviations are detected, GUD reserves the right to test whether and under what conditions gas transports are allowed to be undertaken.

**5.2** Prior to commissioning, the technical pipe section of the M&C system shall be cleaned of impurities and, if necessary, temporary measures taken to catch remaining impurities in order to prevent damage to and malfunctions of the measurement, safety and control facilities.

**5.3** It is a precondition for commissioning that all statutory and official requirements shall be met; this includes the certified test performed by an expert in accordance with § 6 of the regulations

governing high-pressure gas pipes (GasHL-VO). Furthermore, the grid access point partner shall have an expert determine the functional capacity of the installed safety facilities and document the same by presentation of the inspection report.

A copy of the preliminary certificate in accordance with § 6 para. 1 GasHL-VO shall be given to GUD prior to commissioning.

**5.4** GUD shall be informed of the planned commissioning date in good time. The grid access point partner shall ensure that experts are on hand during commissioning in order to adjust and check the function of the installed equipment.

**5.5** Providing the conditions in sections 5.1 to 5.4 are met, GUD shall order to the opening of the shut-off fixture in accordance with section 3.2, checking of the measurement equipment and sealing of the valves in the bypass pipe of the gas volume measurement system.

**5.6** A copy of the concluding certificate according to § 6 para. 2 GasHL-VO shall be issued to GUD within 12 months after commissioning of the M&C system.

**5.7** If a reserve measurement train is installed in accordance with section 4.7.2.4, the measurement trains shall be connected in series under varying loads at the request of GUD following commissioning of the M&C system. The measurement results shall be logged.

#### **6. Operation and maintenance**

**6.1** The grid access point partner is obliged to operate the M&C system in accordance with statutory provisions in conjunction with the generally recognised rules of technology.

**6.2** The grid access point partner shall maintain the M&C system in accordance with the requirements of DVGW worksheet G 495. The grid access point partner shall present the documentation of maintenance activities demanded by this worksheet to GUD on request.

**6.3** Damage, defects and malfunctions to the M&C system that impair or could impair the functional capability of the measurement system as well as measures taken to rectify the same shall be notified to GUD immediately by the grid access point partner by telephone and in writing.

**6.4** Lead seals on measurement instruments used for measuring the quantity of heat are only allowed to be removed with the prior approval of GUD, whilst lead seals affixed by a calibration authority are only allowed to be removed with the prior approval of the calibration authority and GUD.

In the event that the immediate removal of lead seals is required due to malfunctions, if delay would represent a risk or in order to avoid significant disadvantages, the grid access point partner

shall inform GUD of this immediately by telephone and in writing.

In the event that the associated, sealed bypass train has to be used in order to maintain supply in the event of malfunctions of the gas volume measurement system, GUD shall be informed of this immediately by telephone and in writing. The grid access point partner shall immediately inform GUD of the time of opening and time of closing of the bypass pipe by telephone and in writing. Furthermore, the grid access point partner shall document this procedure. The lead seals on measurement instruments used for ascertaining the heat quantity shall be reapplied by the calibration authority in the presence of GUD. GUD shall reapply the lead seal to the bypass pipe.

**6.5** No objects other than those required for operation shall be present in the M&C system.

## **7. Recording, processing and evaluation of the measurement results**

**7.1** The grid access point partner is responsible for recording, processing and evaluating the measurement results. The data are processed in accordance with statutory provisions and the DVGW rules.

**7.2** The quantity of heat transferred / consumed by the grid access point partner shall be based on the volumes measured in the gas volume measurement system, converted to standard temperature and pressure ( $T = 273.15 \text{ K}$ ;  $p = 1.01325 \text{ bar}$ ) with consideration for compressibility and any corrections as well as the gas composition of the transported gas.

The amount by which the gas meter has incremented shall be the basis for ascertaining the transferred/consumed gas quantity. The counter reading of the quantity converter shall be used if the gas meter does not have an independent counter.

**7.3** The following evaluation periods are defined:

- Hour (h):  
The hour time applies
- Day (d):  
The period from 06:00 hours on one day to 06:00 hours on the next day applies
- Month (m):  
The period from the first calendar day of a month at 06:00 hours to the first calendar day of the following month at 06:00 hours applies
- Year (a):  
The period from 1 October, 06:00 hours in one year to 1 October, 06:00 hours of the next year applies

All time information relates to the legally applicable time in Germany.

Settlement shall take place monthly for the elapsed month. The smallest settlement period is one hour of time.

**7.4** In order to calculate/check the transferred/consumed quantity of heat during the settlement period, the grid access point partner shall always provide GUD with the following data and technical recordings by the date agreed in the grid coupling or grid connection contract, however no later than the third working day of the following month:

- Meter readings at the start and finish of the settlement period, generally on the 1st calendar day of the month at 06:00 hours.  
Whenever the contract is changed in the middle of the month, for example a change of supplier, a reading shall be taken on the changeover date.  
If, under exceptional circumstances, the meter readings cannot be read at 06:00 hours, the transferred/consumed quantity of gas shall be calculated back to 06:00 hours.
- Measurement pressure and measurement temperature
- Hour values relevant to settlement
- Gas composition parameters relevant to settlement
- The recordings required in the approvals of the gas composition measurement systems. These shall be returned to the grid access point partner following inspection.

The details concerning the extent of the data and technical recordings as well as the form of evaluation and transfer shall be mutually agreed.

If the aforementioned data and technical recordings are not available on the agreed date, are incomplete or cannot be evaluated, GUD shall be entitled to base the settlement on values estimated by GUD. The correction shall be made as part of the next settlement.

Every time the data is read, a check shall be performed to ensure that the registration and data recording devices are in accordance with one another and that they match the statutory time in Germany. Deviations or corrections shall be notified to GUD.

**7.5** The grid access point partner and GUD shall define according to which of the following processes the quantity of heat transferred/consumed by the grid access point partner shall be calculated during the particular settlement period and on what basis the settlement shall be made, unless the transferred/consumed quantity of heat is continuously measured by equipment and in accordance with the technical equipment of the measurement system and the provisions of the grid coupling or grid connection contract.

**7.5.1** The total calculated standard volume (total quantity in  $\text{m}^3(V_n)$ ) during the particular settlement period is multiplied by the allocated arithmetical mean calorific value during the particular settlement period in  $\text{kWh}/\text{m}^3$ . The calorific value is constantly measured by a gas composition measurement system or calculated by a gas composition reconstruction system. The result is the total quantity of heat to be paid for in kWh.

**7.5.2** If the calorific value used in the settlement is measured in the same M&C system or if a settlement calorific value is calculated by a gas composition reconstruction system for the particular M&C system then the quantity-weighted calorific value can be used as an alternative for determining the total quantity of heat to be paid for. The quantity weighting of the calorific value is performed using the standard volumes on the basis of hourly or daily values.

**7.5.3** Alternatively, the grid access point partner can calculate the quantity of heat transferred/consumed during the particular settlement period by adding together all hourly heat quantities during the particular settlement period. To do this, the hourly measured standard volume (hourly quantity in  $\text{m}^3(V_n)$ ) is multiplied by the arithmetic mean calorific value in  $\text{kWh}/\text{m}^3$  that is made up of all continuously measured calorific values during

- either this hour
- or during the day in question
- or during the settlement period in question.

The cumulative value is the total quantity of heat in kWh to be paid for.

**7.6** The calculation of hourly quantities of heat is performed using the process in section 7.5 in order to calculate the quantity of heat consumed during the particular settlement period.

**7.7** In the event of malfunctions of the measurement system, replacement values required for the settlement shall be obtained in accordance with DVGW worksheet G 685, 3rd supplement.

## **8. Calibration, recalibration and inspection of the measurement instruments**

**8.1** GUD shall be informed in good time prior to planned calibration, recalibration and inspection work on the measurement system in order to give GUD the opportunity to participate. The grid access point partner shall provide GUD with the results of calibration, recalibration and inspection work on the measurement instruments as a copy.

**8.2** Gas meters operating with an operating excess pressure of  $p_e > 4$  bar shall be subjected to a high-pressure test or high-pressure calibration in accordance with the PTB inspection rules, volume 30. GUD shall be notified of the inspection dates in good time to allow GUD to take part in the high-pressure tests or high-pressure calibrations.

The arrangements apply accordingly to recalibrations.

**8.3** The grid access point partner shall operate the measurement instruments within the particular applicable calibration error limits and shall have the necessary statutory calibration work performed immediately.

**8.4** GUD reserves the right to check all measurement instruments used as the basis for settlement at appropriate intervals.

In the case of gas volume measurement systems in accordance with section 4.7.2.4, the main and reserve measurement trains shall be connected in series for monitoring purposes in order to make this possible.

The individual dates shall be agreed between the grid access point partner and GUD.

**8.5** If calorimeters are used for measuring the gas composition, the grid access point partner shall continuously ascertain the calibration values in accordance with the process described in PTB directive G 12 and shall use these for correcting the measurement values. The measured calibration values shall be documented in the prescribed form.

The calibration and correction process in accordance with PTB directive G 12 shall also be applied to the measurement values of standard density measurement instruments if these have PTB approval as independent measurement instruments and are not directly used for quantity conversion.

**8.6** The grid access point partner shall maintain a supply of the testing and calibration gases required for testing and calibrating the gas composition measurement instruments at its own expense. Only officially approved and certified testing and calibration gases shall be used.

Furthermore, a supply of an analysed natural gas (test gas) similar to the measurement conditions shall be maintained for the test in the operating point in accordance with section 4.7.3.3.

The grid access point partner shall be responsible for the costs of calibration, recalibration and testing work on its measurement systems. GUD shall be responsible for its own expenses.

**8.7** If there is any doubt as to whether the operating method of the calibrated measuring instruments is correct, the grid access point partner or GUD is entitled to demand an inspection on a nationally recognised test rig.

This inspection is to be performed without delay by the grid access point partner.

The grid access point partner shall inform GUD in good time about the date of the test, in order to give it the opportunity to attend.

If this test establishes that the measurement error is outside the calibration error limit, the grid access point partner shall ensure that the measurement instrument is immediately repaired and recalibrated at its own expense. The grid access point partner shall be responsible for the costs of the inspection.

If the measurement error is established as being within the calibration error limit in this inspection, the party which demanded the inspection shall be responsible for the costs. At the same time, the grid access point partner or GUD is entitled to demand a new calibration of the measurement instruments in question with the objective of optimising them in order to bring the measurement error or error curves down towards zero. The partner who demands the optimisation shall be responsible for the costs of the calibration.

#### **9. Subsequent correction of the settlement**

**9.1** If the error established during an inspection is outside the transport error limit or if both parties accept that the measurement system is suffering from a malfunction with consequent effects on the accuracy of the instruments for measuring the quantity of heat, the settlement for the duration of the incorrect operating method shall be corrected. The error correction shall be in accordance with the magnitude of the established error.

The correction shall apply at most to the period of the month during which the error was established and the 6 previous months.

**9.2** Interventions made by the grid access point partner into the measurement system that demonstrably lead to incorrect measurements shall require the correction of the measurement data relevant to the settlement to the extent of the inaccuracy. Section 9.1 shall not apply in this case.

#### **10. Confidentiality**

The grid access point partner and GUD undertake to treat in confidence information and/or data exchanged between themselves in accordance with these guidelines. Clause 1 does not apply if this information and/or data has to be communicated to third parties in order for the grid access point partner or GUD to discharge its contractual obligations correctly, or if the grid access point partner or GUD is subject to a statutory or official obligation to provide information. Communication of information and/or data in cases other than those in clause 2 shall require the prior written permission of the other partner. The other party shall only be entitled to refuse this in justified cases.

#### **11. Separability clause**

Should any individual provision or any part of any provision be or become void or illegal, the validity of the remaining provisions hereof shall in their way be affected. In such case, the grid access point partner and GUD undertake to replace the void and/or illegal provision or provisions by relative provisions coming as close as possible to the technical/economic sense and spirit and purpose of this agreement as if these provisions had been agreed from the beginning, in other words starting from the moment of when they become ineffective. The corresponding applies if any provisions are revealed to be unenforceable or if a gap in the provisions is subsequently identified which, in the opinion of both parties to the contract, requires correction.

#### **12. Validity**

These guidelines are part of the terms and conditions of business of Gasunie Deutschland Transport Services GmbH as well as the grid coupling or grid connection contracts, the provisions of which are used — in particular with regard to liability and loyalty.

## APPENDIX

### to the guidelines of Gasunie Deutschland Transport Services GmbH for planning, setting up and operating a grid connection

Overview of the provisions to be applied (status: 01.07.2008)

<b>EnWG</b>	- Gesetz über die Elektrizitäts- und Gasversorgung (Energiewirtschaftsgesetz EnWG)
<b>Eichgesetz</b>	- Gesetz über das Eich- und Messwesen
<b>GasHL-VO</b>	- Verordnung über Gashochdruckleitungen
<b>Eichordnung</b>	- Verordnung zum Gesetz über das Eich- und Messwesen
<b>GasNZV</b>	- Verordnung über den Zugang zu Gasversorgungsnetzen
<b>Elex V*</b>	- Verordnung über elektrische Anlagen in explosionsgefährdeten Räumen
<b>VbF*</b>	- Verordnung über die Errichtung und den Betrieb von Anlagen zur Lagerung, Abfüllung und Beförderung brennbarer Flüssigkeiten zu Lande (Verordnung über brennbare Flüssigkeiten)
<b>UVV</b>	- Unfallverhütungsvorschriften der zuständigen Berufsgenossenschaft
<b>DVGW G 260</b>	- Gasbeschaffenheit
<b>DVGW G 262</b>	- Nutzung von Gasen aus regenerativen Quellen in der öffentlichen Gasversorgung
<b>DVGW G 280</b>	- Gasodorierung
<b>DVGW G 469</b>	- Druckprüfverfahren für Leitungen und Anlagen der Gasversorgung
<b>DVGW G 486</b>	- Realgasfaktoren und Kompressibilitätszahlen von Erdgasen; Berechnung und Anwendung
<b>DVGW G 488</b>	- Anlagen für die Gasbeschaffenheitsmessung; Planung, Errichtung und Betrieb
<b>DVGW G 491</b>	- Gas-Druckregelanlagen für Eingangsdrücke bis einschließlich 100 bar; Planung, Fertigung, Errichtung, Prüfung, Inbetriebnahme und Betrieb
<b>DVGW G 492</b>	- Gas-Messanlagen für einen Betriebsdruck bis einschließlich 100 bar; Planung, Fertigung, Errichtung, Prüfung, Inbetriebnahme und Betrieb und Instandhaltung
<b>DVGW G 495</b>	- Gasanlagen-Instandhaltung
<b>DVGW G 496</b>	- Rohrleitungen in Gasanlagen
<b>DVGW G 498</b>	- Durchleitungsdruckbehälter in Rohrleitungen und -anlagen der öffentlichen Gasversorgung
<b>DVGW G 499</b>	- Erdgas-Vorwärmung in Gasanlagen
<b>DVGW G 685</b>	- Gasabrechnung
<b>DVGW G 1000</b>	- Anforderungen an die Qualifikation und die Organisation von Unternehmen für den Betrieb von Anlagen zur leitungsgebundenen Versorgung der Allgemeinheit mit Gas (Gasversorgungsanlagen)
<b>DVGW G 1010</b>	- Anforderungen an die Qualifikation und die Organisation von Betreibern von Erdgasanlagen auf Werksgelände
<b>DVGW G 2000</b>	- Mindestanforderungen bezüglich Interoperabilität und Anschluss an Gasnetze
<b>DIN 3380</b>	- Gas-Druckregelgeräte für Eingangsdrücke bis 100 bar
<b>DIN 3381</b>	- Sicherheitseinrichtungen für Gasversorgungsanlagen mit Betriebsdrücken bis 100 bar
<b>DIN 30690</b>	- Bauteile in der Gasversorgung
<b>DIN VDE 0100</b>	- Bestimmungen für das Errichten von Starkstromanlagen mit Nennspannungen bis 1000 Volt
<b>DIN VDE 0165</b>	- Errichten elektrischer Anlagen in explosionsgefährdeten Bereichen
<b>DIN VDE 0170/0171</b>	- Elektrische Betriebsmittel für explosionsgefährdete Bereiche
<b>PTB PR Band 30</b>	- Messgeräte für Gas; Hochdruckprüfung von Gaszählern
<b>PTB TR G 7</b>	- Eichung bzw. Beglaubigung von Gaszählern mit Hochdruckgas
<b>PTB TR G 9</b>	- Eichung von Zustands-Mengenumwertern und Wirkdruckgaszählern mit Zustandserfassung für Gas mit realem Zustandsverhalten
<b>PTB TR G 12</b>	- Korrektur der Messwerte von Brennwertmessgeräten (Gaskalorimeter) und Normdichtemessgeräten für Gase
<b>PTB TR G 13</b>	- Einbau und Betrieb von Turbinenradgaszählern
<b>Explosionsschutzrichtlinie</b>	- Richtlinie für die Vermeidung der Gefahren durch explosionsfähige Atmosphäre mit Beispielsammlung (EX RL)
<b>AfK-Empfehlung Nr.5</b>	- Kathodischer Korrosionsschutz in Verbindung mit explosionsgefährdeten Bereichen

\* For public gas supply systems, only with regard to the generally approved rules of technology