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Dear Colleague

### **Open letter: Consultation on relaxing the accuracy requirements of Calorific Value Determining Devices**

In our<sup>1</sup> letter dated 1 March 2016<sup>2</sup> responding to the Energy Networks Association (ENA) consultation on Reducing Costs and Removing Barriers for Low Flow Entry Sites<sup>3</sup>, we stated that we had been discussing with a third party a proposal to relax the currently accepted accuracy requirements for Ofgem-approved Calorific Value Determining Devices ("CVDD"). We further stated that should a robust, transparent, quantitatively argued proposal which is of sufficient quality be received then we would consult on it.

Ofgem has received a suitable proposal from Northern Gas Networks ("NGN") which proposes a new CVDD, the Gas PT2, and the relaxation of the current accuracy requirements to 0.2MJ/m<sup>3</sup> (approx. 0.5%) which is published alongside this letter together with the Gas PT2 Technical Note to Energy Regulators on behalf of Orbital Gas Systems, UK in support of the approval of the Gas PT2 CVDD.

This open letter seeks views on NGN's proposal and on our minded-to decision to relax the current accuracy requirements of 0.14MJ/m<sup>3</sup> to 0.2MJ/m<sup>3</sup> (approx. 0.5%).

### **Background**

Under the Gas (Calculation of Thermal Energy) Regulations 1996, as amended ("the Regulations"), Ofgem is responsible for ensuring that customers are protected from the financial impact of receiving gas that is of a significantly lower calorific value ("CV") than they are charged for. This necessitates using CVDDs at over 150 locations throughout Great Britain ("GB") to assess the CV of gas entering or transferring between networks. These CVs, together with associated relevant flow rates, are used by gas transporters to calculate the energy they transport on behalf of shippers and the daily CVs that will be used by suppliers to produce consumers' gas bills. It is therefore important that CVDDs should achieve and maintain appropriate levels of accuracy.

The Regulations do not specify what level of accuracy is required but provide that "*a gas transporter shall...provide and maintain such premises, apparatus and equipment for the purpose of making such determinations as the [Authority] may direct*".<sup>4</sup>

<sup>1</sup> References to "Ofgem", "the Authority", "we", "us" and "our" are used interchangeably in this letter. The Authority is the Gas and Electricity Markets Authority. Ofgem is the Office of the Authority.

<sup>2</sup> <https://www.ofgem.gov.uk/ofgem-publications/99344>

<sup>3</sup> <http://www.energynetworks.org/assets/files/news/consultation-responses/Reducing%20Costs%20and%20Removing%20Barriers%20Consultation%20PDF.pdf>

<sup>4</sup> Regulation 6, Gas (Calculation of Thermal Energy) Regulations 1996

When calculating any daily CV, the Regulations specify that any amount of less than 0.05MJ/m<sup>3</sup> shall be ignored and any amount of less than 0.1MJ/m<sup>3</sup> but not less than 0.05MJ/m<sup>3</sup> shall be treated as it were 0.1MJ/m<sup>3</sup>. When calculating the average CV over a gas period, the Regulations refer to ignoring any amount less than 0.1MJ/ m<sup>3</sup>.

Broadly, the current requirements for Ofgem-approved CVDDs are that:

- they should be tested in accordance with ISO 10723 (this is discussed in the next section below);
- in any test carried out, the bias error should not exceed 0.1MJ/m<sup>3</sup>; and
- the difference between the certified CV and the calculated CV shall not exceed 0.14MJ/m<sup>3</sup>.

Currently, the only instruments able to provide the above required levels of CVDD accuracy of CV measurement appear to be gas chromatographs. These instruments are also capable of very accurate and comprehensive analysis of the composition of the constituent gases, and thus include the ability to monitor gases for ensuring compliance with the Gas Safety (Management) Regulations 1996, Schedule 3 requirements. Gas chromatographs and the associated necessary ancillary equipment can therefore be expensive.

In the sole context of CV determination under the Regulations, this enhanced capability is not necessary, particularly if other flow metering, sample rate and speed of response factors are considered when assessing overall accuracy. The more limited requirements for monitoring only the CV of gases to ensure compliance with the provisions of the Regulations means the use of cheaper and simpler CVDDs may be more appropriate and proportionate devices, while still providing adequate fiscal protection to customers.

Ofgem actively encourages regulated network companies to facilitate biomethane connections to the network. We are also keen to ensure that the current arrangements and Ofgem's accuracy requirements are not an undue impediment to technological, commercial and other innovative developments. This approach is set out in our open letter of 21 August 2014 on gas energy measurement in consumer billing.<sup>5</sup> Ofgem would, therefore, be broadly supportive of appropriate initiatives that would reduce such impediments whilst still adequately protecting customers.

## Discussion

We understand that the current 0.14MJ/m<sup>3</sup> parameter was derived from the level of accuracy possible (approximately 0.1 MJ/ m<sup>3</sup> (i.e. approx. 0.25%)) when the Danalyser chromatograph was first approved. However, there are a number of international standards published by independent bodies and used by industry and others which use different accuracy levels.

### International Standards

The International Organization for Standardization (ISO)<sup>6</sup> is an independent, non-governmental international organisation which develops and publishes international standards. It brings together experts to share knowledge and develop voluntary, consensus-based, market relevant international standards that support innovation and provide solutions to global challenges. The ISO standards relevant to CV-testing include:

- **BS EN ISO 10723: 2012** Natural gas — Performance evaluation for analytical systems

This International Standard describes a method for evaluating the performance of analytical systems intended for the analysis of natural gas.

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<sup>5</sup> <https://www.ofgem.gov.uk/ofgem-publications/89465/cvopenletter210814.pdf>

<sup>6</sup> <http://www.iso.org/iso/home/about.htm>

- **ISO 15971: 2008** Natural gas — Measurement of properties — Calorific value and Wobbe index

In many cases, it is possible to calculate the calorific value of natural gas, with sufficient accuracy, given the composition (see ISO 6976). However, it is also possible, and sometimes a preferred alternative, to measure calorific value using any one of several techniques that do not require a compositional analysis. The methods currently in use, and the many factors that it is necessary to address in the selection, evaluation, performance assessment, installation and operation of a suitable instrument, are detailed in this standard.

ISO 15971 categorises the uncertainties associated with the measurement of CV using four Performance Classifications:

**Class 0** Performance in which uncertainty limits of no greater than +/- 0.1% in CV may be associated

**Class 1** Performance in which uncertainty limits of no greater than +/- 0.1MJ/m<sup>3</sup> on a volume-basis CV (approx. 0.25%) may be associated

**Class 2** Performance in which uncertainty limits of no greater than +/- 0.2MJ/m<sup>3</sup> on a volume-basis CV (approx. 0.5%) may be associated

**Class 3** Performance in which uncertainty limits of no greater than +/- 0.5MJ/m<sup>3</sup> on a volume-basis CV (approx. 1.0%) may be associated

The International Organization of Legal Metrology (OIML)<sup>7</sup> is another standards body in the area of CVDD testing. The OIML is a worldwide, intergovernmental organisation whose primary aim is to harmonise the regulations and metrological controls applied by the national metrological services, or related organisations, of its Member States. One of the relevant OIML standards is:

- **OIML R 140: 2007**<sup>8</sup> (E) Measuring systems for gaseous fuel

This OIML Recommendation uses concepts for metrology such as combination of maximum permissible errors applicable to modules in order to determine the maximum permissible error of a measuring system.

This concept does not guarantee that each measurement fulfils the maximum permissible errors and is consistent with a combination of consecutive measurements in the field of gas measurement, and that the probability is very low that all the elements of the system operate at the worst conditions at the same time.

This approach can be considered a good compromise between a scientific approach and a practical but rigorous approach. It should provide a better idea of the holistic accuracy of measurement.

This Recommendation categorises the maximum permissible errors for CV measurement (only CVDDs) into three Accuracy Classes:

**Class A** 0.5% (approx. equivalent to 0.2MJ/m<sup>3</sup>)

**Class B** 1.0% (approx. equivalent to 0.4MJ/m<sup>3</sup>)

<sup>7</sup> <https://www.oiml.org/en>

<sup>8</sup> [http://www.oiml.org/en/files/pdf\\_r/r140-e07.pdf](http://www.oiml.org/en/files/pdf_r/r140-e07.pdf)

**Class C** 1.0% (approx. equivalent to 0.4MJ/m<sup>3</sup>)

### *The Role of Independent Certification Bodies*

There are a number of independent certification bodies that are accredited to provide certification of products such as the Gas PT2. Accreditation is the formal recognition that an organisation is competent to perform specific processes, activities, or tasks in an impartial, reliable credible and accurate manner. UKAS<sup>9</sup> provide this accreditation of certification bodies in the UK. An accredited certification body could therefore test a product to establish whether it can meet the approval parameters we have set and this certification could be used to support an application for a CVDD product to be approved by Ofgem.

In view of the availability of international standards and such accredited certification bodies and in the interests of consumers, Ofgem does not consider it good practice to continue to use arbitrary and historically unsupported parameters for approving CVDDs. We consider it better practice to align our approval parameters to internationally accepted CVDD accuracy tolerance levels.

There have also been significant changes to the gas market and an increased focus on the environmental impacts of fossil fuel since the Regulations came into effect. The introduction of biomethane into the system from an increasing number of small production facilities has highlighted the need to ensure the regulatory cost burden of CV measuring equipment is proportionate to the benefits gained.

Ofgem considers there is a good case for relaxing the currently accepted accuracy requirement of Ofgem-approved CVDDs if this enables more appropriate and cheaper CVDDs to be approved by Ofgem for full CV determination of gas, both at entry and within the gas system. This has the potential to significantly reduce the costs to consumers of CV monitoring and to encourage more production facilities to inject environmentally friendly biomethane into the system. It may also help facilitate the introduction of further innovation and technological change in this field.

### **Ofgem's minded-to decision**

The attached proposal from NGN, together with the Gas PT2 Technical Memo to Regulators, sets out their case for a relaxation of the current Ofgem-approved CVDD parameters from 0.14MJ/m<sup>3</sup> to 0.2MJ/m<sup>3</sup> (approx. 0.5%) which may then allow the Gas PT2 to achieve the Ofgem approval parameters required for it to be used as a CVDD.

We do not consider this proposed change would be likely to have a detrimental impact on customers. We are therefore minded to support this proposal and, subject to responses to this consultation, propose to revise our approval limits for CVDDs to an accuracy equivalent to Class 2 performance under ISO 15971:2008 and Class A performance under OIML R 140: 2007 - namely 0.2MJ/m<sup>3</sup> (approx. 0.5%).

### **Views sought**

We seek views from industry, consumer groups and any other parties on NGN's proposal, our minded-to decision and any related issue. Please send your response to Steve Brown at [steve.brown@ofgem.gov.uk](mailto:steve.brown@ofgem.gov.uk) by **Friday, 6 January 2017**.

Unless marked confidential, all responses will be published on our library and on our website, [www.ofgem.gov.uk](http://www.ofgem.gov.uk). You may request that your response be kept confidential. We will respect this request, unless the law requires us to disclose anything, for example under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004. If you would like your response to remain confidential, clearly mark the document to that

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<sup>9</sup> <http://www.ukas.com/>

effect and include the reasons for confidentiality. Put any confidential material in the appendices to your response.

Yours faithfully

Steve Brown  
Senior Technical Adviser  
Gas Networks