Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

NIA Project Registration and PEA Document

Date of Submission

Jan 2017

Project Reference Number

NIA_SGN0107

Project Registration

Project Title

IGEM Gas Quality Standard Working Group

Project Reference Number

NIA_SGN0107

Project Licensee(s)

SGN

Project Start

January 2017

Project Duration

4 years and 3 months

Nominated Project Contact(s)

Phil Bradwell (SGN) – lead network Phil Hobbins (NGGT) Andy Lewis (Cadent) Catherine Litster (WWU) Ben Hanley (NGN)

Project Budget

£282,800.00

Summary

The principle objective of the working group is the production of an IGEM standard covering UK gas quality specification in order to facilitate a change from GS(M)R that reflects the decline in UKCS, the available alternative sources of gas and aligns with the European standard. The standard will set the Wobbe Index (WI) range appropriate for the UK initially examining the extension of the upper range. The specification will also examine the further widening in the lower range and changes to other quality parameters at an appropriate stage as and when the evidence emerges. Alongside this technical review there is a parallel process reviewing the legislative and regulatory case for change.

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

Schedule 3 of GS(M)R 1996 sets out the minimum gas quality requirements to ensure safe operation of the system and appliances used by consumers. Gas Transporters have a legal duty not to convey gas that does not comply with these minimum requirements. The gas quality specification was based on the quality of gas originating from the UK Continental Shelf (UKCS) in the North Sea at that time.

Since 1996 there has been a significant shift in the domestic supply in the UK Network. Currently less than half of the gas in the UK network is provided by the North Sea and by 2020 LNG imports are projected to be significantly above this figure. As well as the continuing trend to include imported pipeline and LNG supplies there is also the drive to consider alternative sources from renewables, Shale and Hydrogen. The decline in UKCS supplies combined with the emergence of a European standard, provide a significant case to re-examine the UK gas quality standard.

The Climate Change Act sets the framework for the UK to transition to a low-carbon economy. The Act requires that UK emissions of

greenhouse gases in 2050 be reduced to net zero level to align to the EU standard. The UK Gas Industry is currently exploring a number of innovative projects designed to support and meet our energy needs, whilst also contributing to meeting the climate change targets. Flexible energy networks will play an important role in supporting carbon and cost reduction.

Many of these innovation projects are at various stages of development. These projects address the central issue of reducing our carbon emissions whilst maintaining a safe, secure, reliable and affordable energy source for the consumer. They foresee a future scenario where our future energy needs are met with a mix of natural gas and/or other gases, renewables and low carbon sources.

Schedule 3 of GSMR is a barrier to facilitating change to a lower carbon economy. Exemptions are required to circumvent the regulation leading to a regulatory burden requiring additional time and costs.

Method(s)

Following a number of meetings with IGEM, BEIS, OFGEM and the HSE a structure has been agreed, by the industry, that will oversee the transfer of schedule 3 of GS(M)R to an industry produced standard. Simultaneously a wider review of the GSMR will be undertaken to ensure much needed changes are incorporated into the revised legislation at the same time.

Why an IGEM Standard

An IGEM standard is regularly reviewed and amended and has the confidence of industry and government agencies. Incorporating Schedule 3 into an IGEM standard provides a robust approach with the flexibility of allowing the specification to be appropriately developed as and when new evidence emerges. The review of IGEM standards follows a peer review process which involves wide industry consultation.

This flexibility will benefit the consumer and the industry as the nature of the composition of the gas being consumed by the UK customers' changes. As innovation and diversity of supply continues this would present the UK with a robust, flexible, appropriate and future proofed mechanism.

IGEM Gas Quality standard working group

This group and associated sub groups will compose subject matter experts from across the gas industry and other key stakeholders. The group will meet bi-monthly for the project duration. The group will be an umbrella gas quality working group that initially considers the gas quality changes proposed in the new European Standard EN16726, the Oban (opening up the Gas Market) project, and then subsequently evaluates, identifies and facilitates projects toward gas quality changes. It will create a database of evidence in support of changes. It will potentially identify a number of offshoot projects, subject to a materiality and cost benefit assessment.

IGEM Role

IGEM will take the lead in establishing and facilitating the core working group developing the standard for gas quality. This will involve engagement and consultation with industry, mapping of industry groups and identifying links and necessary representation both in the UK and in the EU. The core group will comprise key stakeholders and subject matter experts on matters relating to schedule 3 of GSMR. IGEM will develop and maintain an evidence database of all relevant studies and projects, both previous and current.

As the project has suffered some unforeseen delays and a degree of scope creep, in March 2019, the working group reviewed the scope and project schedule and it was agreed that the project required a further extension until March 2021 to complete the new standard. The main reasons for the delays were attributed to the following;

Initial resource assessment and project timescales were underestimated due to the nature of the project i.e. numbers of stakeholders and specialised areas affected by the project. Project evidence was highly dependent on other related project outputs. One suffered significant delays due its complexity i.e. "Impacts of gas quality on industrial and commercial users" scheduled for completion in September 2018 yet key supportive evidence was not presented to the group until January 2019.

The initial project scope involved the examination at a later stage of other issues such as the further widening in the lower range and changes to other quality parameters such as Hydrogen, Siloxanes and Sulphur. The later examination and emergence of other issues also had an impact on the project timescales.

For the above reason it was agreed that the project would move forwards on the basis that all gas quality changes may be included in the new standard subject to the evidence available at time of submission to avoid any further delays to the initial new standard. Work will continue in parallel on all elements not submitted during the extension period only, on the basis that these changes could be submitted at a later stage.

The extension and additional funding will cover IGEM costs, specialist consultants, stakeholder meetings and any other additional research required in gathering the evidence to include the gas quality changes into the new standard.

The plan will be to formulate a new committee to agree the new terms of reference to drive the production of the new standard that will include in the next revision and the additional gas quality changes.

A new edition of the standard will be put forward to the new committee to undertake a full review with comments followed by a final version for publication of the updated standard.

Scope

The principle objective of the working group is the production of an IGEM standard covering UK gas quality specification in order to facilitate a change from GS(M)R that reflects the decline in UKCS, the available alternative sources of gas and aligns with the European standard. The standard will set the Wobbe Index (WI) range appropriate for the UK initially examining the extension of the upper range. The specification will also examine the further widening in the lower range and changes to other quality parameters such as Hydrogen, Siloxanes and Sulphur at an appropriate stage as and when the evidence emerges. Alongside this technical review there is a parallel process reviewing the legislative and regulatory case for change.

GS(M)R was introduced as a statutory instrument, essentially to ensure the safe use and management of the flow of gas through the gas network in Great Britain. The regulations stipulate the requirements for what the content and characteristics of gas should be, and ensures arrangements are in place to minimise the possibility of a gas supply emergency developing. It also requires that there is a continuously staffed telephone service for enabling people to report escapes of gas and places an obligation on those conveying gas to make safe the gas escape, as soon as reasonably practicable after being told about the escape. GS(M)R came into force in 1996 and since then, the GB gas landscape has undergone many changes, to the extent that the existing regulations are no longer reflective. A demonstration of this is the large number of exemptions granted to gas conveyors under the regulations.

To enable this initial review, it was proposed that an industry-led GS(M)R Review Steering Group be established, comprised of experts from across the gas industry. In addition to this Steering Group, it was also proposed to set up a governance structure designed to address scientific and technical expertise, provide independent legal support and obtain contribution and sign-on from key industry members. This will ensure that the conclusions from the review are supported by a documented, evidenced-based justification, supporting the case for change. The ENA set up steering group, which was chaired by WWU with members from Cadent, SGN, NGN, National Grid IOG, National Grid Transmission, Eversheds, EUA and IGEM.

The group will formulate a new committee and provide new terms of reference to drive the production of the new standard.

The working group shall produce a draft standard for industry comment. Once this stage is completed the group will review and address all comments and produce a draft for approval by the IGEM Technical Coordination Committee.

Other gas quality changes relating to lowering the Wobbe index, siloxanes and hydrogen content will continue to be reviewed and developed throughout the project. Subject to the progress on each and time of submission, changes will either be included in the draft for industry comment or be processed at a later stage as part of a further amendment.

Objective(s)

The objectives of the project are:

- Set up of a core group to drive the production of the standard and ensure appropriate representation from across the industry and supply chain
- Identify and map relevant industry groups and bodies and develop a robust communication process and feedback method
- Identify links and necessary representation for these both in the UK and in the EU.
- Set up of sub groups (where required) which will examine the specific potential effects of a change in GS(M)R on the supply chain, industry, customers and asset owners
- Develop database of current and previous studies into gas quality and order evidence in accessible format. –August 2019 Provide detailed reports of progress on a six-monthly basis – First report due in December 2019/Jan 2020
- Produce final version for publication of the updated standard -December 2020.
- Evaluate, identify and facilitate projects toward future gas quality changes.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The success criteria for the project are:

- Database of current and previous studies into gas quality developed
- Production of 6 monthly progress reports
- Completion of the review process of the IGEM standard covering UK gas quality specification in order to facilitate a change from GS(M)R
- Agreement and approval of the IGEM standard covering UK gas quality specification in order to facilitate a change from GS(M)R
- An established platform to evaluate future gas quality projects

Project Partners and External Funding

None

Potential for New Learning

Gas quality requirements are changing. Understanding and evidence of gas quality impacts have advanced significantly through significant projects both in the UK and in the EU. For example, the 'Opening up the Gas Market' project has produced a large evidence base in relation to domestic and commercial appliance safety and performance across the Wobbe Index range. This evidence suggests that GB gas consumers would benefit from allowable gas quality changes to the upper and Wobbe index.
The learning will be extended by considering other gas quality parameters that will include lower of the Wobbe index, Hydrogen, Siloxanes and Sulphur limitations at an appropriate stage as and when the evidence emerges

Scale of Project

This working group will cover gas quality aspects that impact the entire gas chain including transmission and distribution. Every network will be impacted. The working group will comprise of representatives from the entire gas chain including each network.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

This is a desk top exercise involving the creation and review of an IGEM standard. This will be carried out at the chosen location of the core group and sub groups in the UK and EU. IGEM will facilitate the working group and Committee.

Revenue Allowed for the RIIO Settlement

None.

Indicative Total NIA Project Expenditure

The total project revised expenditure costs is £282,800

Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

n/a

How the Project has potential to benefit consumer in vulnerable situations:

n/a

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

Analysis obtained from National Grid and IGEM has shown that the potential benefit of changing the Wobbe Index within GS(M)R to remove the requirement for nitrogen ballasting in GB would save around c.£180m per annum, rising to £325,000,000 per annum as LNG utilisation increases. These figures are considered conservative as they exclude potential processing costs associated with pipeline imports.

Please provide a calculation of the expected benefits the Solution

Although this is a research based working group with no direct benefits as such, one of the objectives of the group is the production of a new gas quality standard. It is envisaged that this standard will incorporate a wider Wobbe Index range than currently permitted under GS(M)R. SGN's Opening up the Gas Market NIC project demonstrated that the Wobbe Index upper limit could be increased safely to 53.25 MJ/m3.

A new gas quality standard with an upper WI of 53.25 MJ/m3 will provide financial benefits. The cost associated with nitrogen ballasting in the UK to meet the current GS(M)R limit of 51.4 MJ/m3 is estimated to reach £325m per annum as LNG utilisation increases. For the purpose of the Cost Benefit Assessment (CBA) estimates have been based on the costs associated with the annual cost of nitrogen ballasting in the UK.

Base Cost

Annual cost of nitrogen ballasting = £325,000,000

New Method Cost

There is no ongoing method cost associated with widening the wobbe index. It is assumed that the need for ballasting will be removed entirely = £0

Total Savings

Total estimated annual savings = £325,000,000

Whilst this estimate provides an indication of potential cost benefit, it is important to note that it is also based on a number of assumptions and estimates. However, despite this, it assumed that this figure is conservative as it does not include the intangible benefits of increasing the efficiency of the gas market through opening it up to more sources of gas.

A new standard could remove costs associated with exemptions currently required to circumvent regulation that leads to regulatory burden requiring additional time and costs for both government and Networks.

Please provide an estimate of how replicable the Method is across GB

This project is applicable to all gas networks including Transmission.

Please provide an outline of the costs of rolling out the Method across GB.

There are no method costs associated with this working group other than the £282,200 set up and running costs.

Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☐ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☐ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☑ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

RIIO-2 Projects

☐ A specific piece of new equipment (including monitoring, control and communications systems and software)

☐ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☐ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☐ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

Network licensees need to understand how flexible the network can be in relation to gas quality, both in terms of risk and how it can be managed.

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

Competition, security of supply and lowering of carbon emissions.

☑ Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

Is the default IPR position being applied?

☑ Yes

Project Eligibility Assessment Part 2

Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

The project is designed to ensure all previous work, both in the UK and in the EU is identified, evaluated and reviewed.

All networks will participate in the project. This will be first cross industry collaboration project of its kind for the development of a gas quality specification in the UK since 1985.

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

n/a

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

Project has not been tried due to current legislation in place that will requires a significant shift from the norm to change legislation including support from several stakeholders outside of the gas networks. The development of a new standard for gas quality will open up the gas market and provide a pathway to decarbonisation of the networks.

Relevant Foreground IPR

n/a

Data Access Details

n/a

Please identify why the Network Licensees will not fund the project as apart of it's business and usual activities

Project objectives and outcomes are considered to be a radical shift from the current network activities

Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

The project involves significant risks both commercially and technically for networks and other stakeholders and significant regulatory change in direction.

This project has been approved by a senior member of staff

☑ Yes