THE INSTITUTION OF GAS ENGINEERS AND MANAGERS

Gas Quality Standard Working Group

7th March 2018

PRIVATE AND CONFIDENTIAL **MINUTE NOS. 096 to 101**

The 11th Meeting of the Gas Quality Standard Working Group of the Institution of Gas Engineers and Managers was held at 10.00 a.m. on Wednesday 7th March 2018 at IGEM, IGEM House, Kegworth, Derbyshire, DE74 2DA.

096
ATTENDANCE

There were present:

Angus McIntosh (GM)	(Chairman) (dialled in)
Ross Anderson (RA)	ICOM
Kevin Bradley (KB)	Isle of Grain, LNG National Grid
Phil Bradwell (PB)	SGN (dialled in)
Mark Cluda (MC)	Cummins
Mark Crowther (MC)	KIWA Gastech
David Goodwill (DG)	Ancala Midsteam
Ben Graham (BG)	NGN
Damien Heylen (DH)	Isle of Grain, LNG National Grid
Dave Lander (DL)	Dave Lander Consulting
Sarah Kimpton (SK)	DNV GL
Ian Marshall (IM)	WWU
Stewart McEwen (SM)	HSE
Ian McCluskey (IM)	IGEM
Richard Payne (RP)	Cummins
Ian Redshaw (IR)	HSE
Nancy Thompson (NT)	SGN (dialled in)
Tom Bancroft (TB)	IGEM Technical Officer

Apologies for absence were received from:

Will Webster; Oil and Gas UK
Julie Cox; Energy UK
Ben Hanley; NGN
Robyn Jenkins; National Grid
Neil Macdonald; HHIC

097
PAPERS CIRCULATED BEFORE THE MEETING

IGEM-TSP-17-303 – Gas Quality Action Log

IGEM-TSP-18-069 National Grid Gas Quality Consultation Report

IM welcomed everyone to the meeting and introductions were made.

098
MINUTES OF THE LAST MEETING

The minutes of the last meeting were signed off as an accurate reflection of the meeting.

099
NOTES FROM THE MEETING

a) ACTION LOG

The action log was presented to the group and the outstanding actions were discussed with updates detailed below:

Action Number 1– NIA project update – JH to circulate summary report and present at the next meeting.

ACTION: John Harris

There was further discussion on this and pipeline crack propagation. JH reported that the rip is larger than you normally design for and that monitoring may need to increase where pipes are exposed. The gas is not currently monitored for this aspect and further work is being considered. It was pointed out that this is not a wobbe issue, is associated with untoughened pipes and National Grid would have to manage it as a business risk. Questions were asked on if we have any quantitative evidence on what pipelines are affected and if controls had to be put in place what would that look like. This innovation only looked at transmission and the evaluation carried out showed risk would increase depending on gas composition for example; the lower the methane content the greater the risk. It was again pointed out that the group needs to be careful on statements that may mislead. Adding nitrogen does not have a significant impact and it isn't a low methane issue it is a gas phase issue. One problem with the Monte Carlo model is it may not be realistic. JH also has risks with current pipes and the wider industry has to recognise the problems that could arise from imported gases.

The second aspect of concern was that changing gas compositions impact safety calculations in standards, particularly 6/7 of IGEM's standards. A question was asked of do we need to look at what gases are being used at a certain point and it would be sensible to consider future gas quality impacts on standards. JH suggested the Monte Carlo model identified that some calculations need changing and felt further work needs to be done. It was asked if this was already part of the scope of NG's project, to look at pipelines, installed equipment risk and hazardous areas? JH confirmed that hazardous areas did not form part of the scope of the NG project. One suggestion was made to have a look at the hazardous area drawings for PRI sites and look at the impacts if gas quality changed. Following this, GM suggested we should decide whether to do a project looking at hazardous area assessment methodology, risk and impact. Networks to identify and share with the group a site example for hazardous area. A clarification of scope was requested for the NG project to see what gaps if any remain for future project consideration.

ACTION: Gus McIntosh/John Harris/Ben Graham/Ian Marshall/Stuart Gibbons

It was decided that this was not a Wobbe index issue and a separate discussion was needed to take place on scoping a piece of work on determining if it is a bulk issue, a hydrocarbon two phase issue, or a composition issue to be controlled via NEAs

Action number 2/9 – **Oxygen content** – These actions have been completed. TB to circulate info from SM with the minutes of the meeting

ACTION: Tom Bancroft

Action number 3 – Emergency Specification – The current proposal is to remove the emergency limits. This action needs leaving open as it still needs to be debated.

Action number 14 – Ongoing.

Action number 17 – study in the Netherlands – Ongoing – SM to check internally for an update.

ACTION: Stew McEwan

Action number 23 – A summary report will be circulated after the meeting and the full report can be circulated in a month or so.

ACTION: John Harris

Action number 30 – CEN working group – Ongoing – needs to picked up by IM and GM.

ACTION: Ian McCluskey/Gus McIntosh

Action number 46 – Marcogaz papers – The 6 monthly report needs pulling together. NT produced the last one and a date needs to be put in the diary to do this again.

ACTION: Ian McCluskey/Nancy Thompson/Gus McIntosh

Action number 53 – Ongoing**.**

Action number 54 – Ongoing **–** SM has circulated a list of new contacts at BEIS. TB to circulate with minutes and IM/GM to make contact as Richard Harris my not be the most suitable contact.

ACTION: Tom Bancroft/Gus McIntosh/Ian McCluskey

Action number 66 – CBA/Cost impact – this needs to be taken outside the group and a decision needs to be made on how to take this further.

ACTION: Gus McIntosh

Action number 67 – Shippers and suppliers engagement – Ian attended the meeting and gave a presentation.

ACTION: Ian McCluskey

Action number 69 – Loss of business – Ongoing – still waiting on profiles on Norwegian shippers

ACTION: David Goodwill

Action number 71 – Medium combustion plant directive – significant impact on asset inventory. Proposals shouldn't be detrimental to the environment. No response from DEFRA on consultation. This needs picking up and the HSE need to be aware.

ACTION: Gus McIntosh

b) Ref paper: IGEM-TSP-18-069 National Grid Gas Quality Consultation Report

Consultation Report:

JH gave an overview of the paper that was circulated prior to the meeting. Important points/actions are detailed below:

- Requests to change entry conditions non GSMR listed. For example requests to increase oxygen content.
- lots of modifications how should we handle them?
- SGN to look into this and provide feedback to JH.

ACTION: Gus McIntosh

c) Peer Review

MC and DL gave an update on the progress of the peer review into Dutton. Unfortunately, they haven't made the progress they would like. There is a timescale of

May for a draft paper to be submitted to the Institute of Energy Journal. It will then be published in a peer review journal and the IGEM journal. DL and MC to keep the group informed.
GM suggested that Richard Soutchard, one of the original co-authors of the Dutton study had made contact and provided insight to the drivers at the time. He endorsed the methodology for the OGM project and the work we are doing, suggesting a review was long overdue. GM suggested it may add value to reference these discussions in the journal submission.
DL did not think this would support the journal paper, which goes through a specific process.

ACTION: Dave Lander/Mark Crowther

d) Carbon Dioxide in natural gas

Presentation by Dave Lander

- Query from Anton Industrial Services

- Arising from national Grid Gas Quality Consultation
- Increasing CO2 content of natural gases
- Service engineer may adjust air-fuel ratio of appliance to ensure CO2 content is in accordance with manufacturer's guidance
- Safety, efficiency implications?

Conclusions

- Increasing carbon dioxide content of natural gases will result in increased carbon dioxide content of combustion products
- Manufacturers' guidance for adjustable appliances is based on performance with G20 reference gas (pure methane)
- Service engineer might be inclined to adjust appliance accordingly
    - Increased excess air levels
    - Reduced efficiency
    - Impact on combustion and CO formation?
    - Bit like ballasting, but with air (and added to the combustion air)?

e) Siloxanes impact study

The last time this was discussed it was not practical to measure or was below the measurable limit. Issues have been raised by HHIC prior to the meeting. RP made the point that siloxanes are a disaster for after treatment and not great for the engine in general. SK to discuss equipment with Martin Brown away from the meeting.

ACTION: Sarah Kimpton

f) I and C update

SK gave a presentation on the I and C study with important points/actions detailed below:

- Overview of the GSMR proposal including comparisons with European gas quality
- Data from NTS offtakes
- Industrial and commercial accounts for 29% of gas use
- Areas include – Electricity, metals, minerals, chemicals, textiles, food/drink, vehicles, engineering etc.

Stakeholder engagement

Analysis

- Stakeholder Impact

One-to-one

- Siemens & Worcester Bosch
- Gas Storage Operators & BP
- ICOM& Riello Burners

Consult

- Questionnaire
- Current uses, gas quality measurements, issues
- Impact of widening Wobbe Index range

Workshop

- The issues and concerns from specific groups of users
- Challenges, impacts and potential solutions
- Industry priorities and timelines

One important conclusion that came from the responses was that the chemical industry needs a lot more focus. Dave Mitchell has now left the CIA. IM to contact CIA for a replacement for the group

ACTION: Ian McCluskey

Summary of Engagement Responses

Five areas of focus

- Industry engagement
- Equipment
- Gas Quality Specification
- Costs
- Hydrogen

The areas were then expanded into barriers, impacts and solutions and the presentation ended with a timeline of changing GS(M)R. The presentation will be circulated with the minutes and will also be available on the IGEM website.

ACTION: Tom Bancroft

This prompted a discussion on the project and the need to id and categorise populations as this hasn't been quantified yet and a challenge around the deliverables within the project scope. SK confirmed the summary on instrumentation on controlling gas quality is in phase one of the report which is still with the steering group and the numbers etc are going into phase 2, which would be circulated shortly. It was agreed the networks to get current rate of change and circulate data to DNV GL. It was also requested that volumes by entry point into the LTS were provided. The power generation sector wish to reduce the range of gas quality to optimise turbine performance. GM suggested rate of change and volume of leaner gas going into the NTS should be considered so we determine the best outcome for the customer.

ACTION: networks

The Cost Benefit Analysis is key to this and outputs need to have site specific examples. SK to circulate examples without commercial information.

ACTION: Sarah Kimpton

Concerns were raised and it was decided that more detail is needed on this. HSE need evidence to show that this is not less safe. The main driver to get the change through parliament was the £325 million saving. In regards to timescales stage 2 should be complete by the end of March. A question was asked if it is possible to plot each entry point position. JH to provide data to assist with this.

ACTION: John Harris

MC will also respond to the questionnaire in regards to his thoughts on the range.

g) Richard Payne presentation

Summary of Engine Gas Needs

- Limit WI range to 3 MJ/m3 at a location
- A change from design range will require major modification so if essential a long lead time should be given and change should be permanent
- Also variation causes questions over efficiency due to inaccurate metering of energy content
- Limit the speed of change in the WI value to 0.1 MJ/min
- Allows control system to react (older engines may not have control system)
- The maximum value for the WI should be 53 MJ/m3 at any location
- To give MN >70
- The sulphur level of natural gas should not exceed 10 mg/m3 of gas.
- Sulphur-free odorants should be used in general
- Hydrogen addition should not cause MN to go below 70
- Acceptable amount depend on starting MN
- Also increases NOx emissions and risk of explosion
- Caution should be taken when adding species to natural gas that deviate from the standard components
- Siloxanes as present in some un-treated biogases have a detrimental effect on the durability of gas engines and poisoning of exhaust catalysts

h) Stewart McEwan – BEIS Update

SM gave an update on BEIS and the areas of interest they will have in the group. These include;

1. The origins of wobbe number
2. Previous consultations
3. Interest in GSMR work
4. Costs, SIU and Oban.

From that they have had discussions with National grid Grain LNG regarding security of supply, costs of LNG etc. they are still in a phase of trying to get as much information as possible and this will feed into the regulatory impact assessment so government can make a decision on behalf of the country. HSE's economists that attended the workshop will be working together with the BEIS economists. I and C may include data that economists require so a commercial discussion is needed.

SM put a series of questions to the group:

- Building on 325 million figure
- Future LNG market
- How much of global LNG doesn't need ballasting
- Views on LNG future
- Adaptation measures to ensure safe operation of compressors, NTS, Domestic equipment
- What work is underway to understand impact of wobbe on greenhouse gas emissions.

SM will present these questions to TB for circulation.

ACTION: Stew McEwan, Tom Bancroft

i) 1st Working Draft Gas Quality Standard

There was a reminder to the group to read the draft and send in any comments they have. TB will recirculate the draft and the comment table.

ACTION: Tom Bancroft

j) CEN Update

There was an action on GM to communicate with BEIS on European gas issues moving forward.

ACTION: Gus McIntosh

100
ANY OTHER BUSINESS

1) GM to circulate Richard's email

ACTION: Gus McIntosh

2) There was a short discussion on a gas analyser handheld product. SK to discuss with GM.

ACTION: Sarah Kimpton

3) Additional testing ODS performance – Approval from SGN to start. KIWA aim to have the work completed by April/May.

4) There was also a discussion on the confusion between widening the wobbe and adding Hydrogen. This is trying to be kept as separate as possible.

5) Wider review of GSMR – another discussion was had on this and that ENA have done the legislative work but the technical part sits in this group and they will wait for the outputs of this group first.

101
DATES OF MEETINGS FOR 2018

25th April

END