331

Client	:	**SCOTIA GAS NETWORKS**
Project Title	:	**BRAISHFIELD "B" MEASUREMENT ERROR REVIEW**
Document Title	:	**RESPONSES to TECHNICAL QUALIFICATIONS RECEIVED on the INTERIM (SMER) REPORT**
Document Ref.	:	**NK3173 – 002**
Client Ref.	:	**SO00114052010**

REV	ISSUE DATE	DESCRIPTION	PREP. BY	APP. BY
1	20/10/10	Issue for Comment	KV	

Kelton Engineering Ltd, 2nd. Floor, Oakland Court, 26 Market Square, South Woodham Ferrers, Essex CM3 5XA
t: +44(0)1245 327707, f: +44(0)1245 327708, w: www.kelton.co.uk, e: info@kelton.co.uk

CONTENTS

1.0 INTRODUCTION

This document details the responses of the Appointed Independent Technical Expert (Keith Vugler of KELTON®) to Technical Qualifications submitted by British Gas in reference to the SMER Interim Report (KELTON® report reference NK3173-001) dated 30/09/2010.

Section 2.0 is structured to;

1. Provide the Interim Report reference for which the Technical Qualification refers.

2. The Technical Qualification itself (cut & pasted exactly as received) from the "marked-up" report version received by British Gas (highlighted in blue text).

3. The associated response by the Independent Technical Expert.

Paragraph 2 – Section 2.0 – Page 4

British Gas Comment; or empirical information from site and records.

Response; Point noted – all appropriate site information & records have been reviewed to determine whether they would "add value" to the mis-measurement review process and included where deemed appropriate (i.e. Figures 3.2, 3.3 and the operating condition graphs within section 5.1)

Paragraph 3 – Section 2.0 – Page 4

British Gas Comment; Agreed but these will introduce additional mis-measurements but they are necessary so have to be under strictly controlled conditions.

Response; Point noted – The report recognises that the site testing is to be implemented within a controlled manner and all steps have been taken to ensure this is achieved.

Paragraph 4 – Section 2.0 – Page 4

British Gas Comment; stated that test do not cover full range of pressure then what?

Response; This reference acknowledges the pressure seen at the first test date. Within the 5th and 6th paragraph of section 2 of page 4, the 2nd paragraph of page 19 and the 4th paragraph of section 5.5.1 of page 21, the report recognises that potential pressure effects must be evaluated at the extremes of operating pressure seen during the SMER (to essentially quantify the potential effects on the equalising valve Cv characteristics). This is why section 5.5.2 has been left "blank" to accommodate the results of further testing at the higher pressure value.

Paragraph 6 – Section 2.0 – Page 4

British Gas Comment; Now? or have they already happened

Response; The higher pressure test is provisionally scheduled for 22nd October 2010 and the results will be included within section 5.5.2 of the final report.

Figure 3.2 – Section 3.0 – Page 7

British Gas Comment; If this is so obvious on the charts why did national Grid not pick it up on the day. Why was it ignored - lack of controls same issue as Farningham

Response; The System Operator(s) are better placed to provide a response to this comment.

Paragraph 2 – Section 5.1 – Page 16

British Gas Comment; Pressure affects parameters within the ISO standard flow calculation and also the calculation of gas density.

Response; *Agreed – Section 6.0 details the gas density effects and the additional pressure related ISO parameters are discussed specifically within 6.2 and 6.3. Perhaps an additional reference to the relevance of both the Isentropic Exponent and the Dynamic Viscosity values should be included within one of these sections of the final report for clarity. As the values are "manually entered" within the OMNI flow computer and have not been updated between the SMER period and the site testing, they are therefore considered as constants.*

Figure 5.1 – Section 5.1 – Page 16

British Gas Comment; Is this axis just data count?

Response; *Yes*

Figure 5.3 – Section 5.1 – Page 17

British Gas Comment; A reported temperature of 30 degC was that correct?

Response; *No - It can be seen that all SMER operating condition graphs (Figures 5.1, 5.3 and 5.4) show significant departures from their "typical" operating value on 9/04/10 due to a controlled site intervention visit. This also applies to the temperature variations seen in Figure 5.3 for 11/03/10 and 25/04/10.*

4th Bullet Point – Section 5.4 – Page 20

British Gas Comment; Why is the valve position in several steps? surely it was left in one position or is the aim to establish this position?

Response; *Whilst the C&I Technician statement (section 3.0 – page 7) records that he found the equalising valve "fully open", it was considered (for completeness) to conduct the site testing for all equalising valve positions to provide a "full range" of valve position sensitivity, in case that the statement (when challenged) was actually "nearly" open or "it might have been a few turns closed"……..!! In addition, one of the testing deliverables was to replicate the effects of the equalising valve Cv to ensure the overall effects throughout the range were indeed in accordance with the manufacturer's stated literature to provide additional testing confidence and transparency of results. It may be that only the results of the "fully open position" (i.e. 7 turns as per the x-axis of the results graphs) will be used within the final SMER evaluation but of course all test data is good test data……..!!*

Paragraph 2 – Section 6.3 – Page 23

British Gas Comment; This paragraph is quite crucial to the calculations need explaining as the tabulated results all show zero it doe not actually give any information. I assume that three different densities are used in the flow calculation, then DP is adjusted to give the previously recorded flow rate (constant?) and the difference in these parameters is recorded.

Response; *Your assumption is correct. What this section is attempting to demonstrate is that for a given constant flow rate any changes in operating pressure (and hence density) will result in a change in differential pressure (to balance the flow equation). As during site testing the flow rate is relatively easily to change (and operating pressure is not) the thought process being that tests carried out on varying differential pressure, would also be equally representative for the observed changes in pressure & density seen during the SMER (for meter stream operation only of course). I will provide more detail for the calculation process used within the final report to provide additional clarity.*

Paragraph 6 – Section 6.3 – Page 23

British Gas Comment; Careful deeming a calculated and defined bias as being negated by real live variations (random error) in a site readings is not matching the same type of error

Response; *Agree with you 100% – The thought process in defining the bias associated with the expansibility effects (worse case at high flow rate of 0.0053%/Barg) as negligible, was more it's significance when compared to the overall provisional SMER of 42% (± a test uncertainty, say 1%).*

Figure 7.1 – Section 7.0 – Page 25

British Gas Comment; This and the following two graphs are critical to the error determination and yet have no explanation of statement of calculation method.

Response; *Agreed – An explanation of the calculation method will be incorporated within the final report.*

For clarity at this time (using Figure 7.1 as an example), the testing initially commenced with a flow rate that (in this case) compared favourably with the higher end flow rates (network achievability permitting) seen during the SMER period with the equalising valve fully open. All observed flow rates were taken from the OMNI flow computer.

Therefore;

1 - Initial flow rate = 158 KSm^3/h with equalising valve fully closed (graph x-axis = 0)

2 – Open equalising valve 1 turn (graph x-axis = 1) – note change in OMNI flow rate & calculate % difference from 1 above (graph y-axis = 14.02%).

3 – Open equalising valve 2 turns (graph x-axis = 2) – note change in OMNI flow rate & calculate % difference from 1 above (graph y-axis = 40.8%).

4 – Repeat for 3 turns open to fully open (7 turns) to construct complete response graph.