

METER ERROR REPORT**FINAL**

Reconcile?	Y
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Safety Issue?	N
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Thesis Report No.	
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1. EXECUTIVE SUMMARY

SITE NAME	BACTON
LDZ	EA
START DATE (actual)	27/05/2013
LAST GOOD DATE	27/05/2013
END DATE	04/08/2013
SIZE OF ERROR (No reconciliation required if under 0.1%)	6.54% (151354 scm)
ESTIMATE – Y/N?	N
ROOT CAUSE	Poor connections on the temperature probe.
ANALYSIS	In the attached spreadsheets
METER TYPE	Turbine
AUTHOR	Piers Eldridge
CHECKED BY	Andy Finch

2. BACKGROUND

Gas is supplied to part of the East Anglia Network at Bacton FWACV offtake. The site comprises one turbine meter system. The meter system uses a gas chromatograph for CV determination and PTZ correction.

On the 5th August 2013 the Measurement and Process Group of Network Integrity was contacted because a technician went to site to investigate a meter suspect alarm.

Upon investigation, it was established that the high temperature reading was caused by a poor connection inside the PT100 probe termination housing.

3. ERROR QUANTIFICATION AND IMPACT

Historic RBD data from Bacton was compared with the RDB data from Roudham Heath. It was discovered that the flow computer started measuring the temperature incorrectly on 27th May 2013.

There was good correlation between the Roudham Heath meter temperature and the Bacton meter temperature before 27th May 2013. The temperature at Bacton was substituted with the temperature at Roudham Heath between 27th May 2013 and 4th August 2013 and the density was re-calculated for each of the 4 minute RBD and gas property data during the period of the error. In each instance, the density correction was applied to the gas flow during the 4 minute period.

From HPMIS, the reported flow through the site between 27th May 2013 and 5th August 2013 was 2.12 Mscm. The recalculated flow is 2.31Mscm. As a consequence, it was estimated that the metering system under-registered 151354 scm of gas.

A spreadsheet detailing the calculations is available on request.

4. CAUSES

The high temperature reading was caused by a poor connection inside the PT100 probe termination housing.

5. RECOMMENDATIONS AND LEARNING

Independent verification of integrity of terminal block connections post validation.

If there a future opportunity arises to install a secondary thermowell test pocket, consideration could be given to an automated comparison check as part of any improved diagnostic coverage plan.

REFERENCES

Network Technician
T/PR/ME/2 parts 1 to 3
Measurement and Process Group of Network Integrity
HPMIS database

VERSION HISTORY

<i>Version</i>	<i>Changes</i>	<i>Author</i>	<i>Date</i>
<i>Rev 1</i>	<i>Final</i>	<i>Piers Eldridge</i>	<i>08/08/2013</i>
<i>Rev 2</i>	<i>27th May 2013 added.</i>	<i>Piers Eldridge</i>	<i>10/12/2013</i>
<i>Rev 3</i>	<i>3rd June 2013 added</i>	<i>Piers Eldridge</i>	<i>10/01/2014</i>

DISTRIBUTION

Asset Owner
Energy Performance
Measurement and Process Group
Asset Strategy
Measurement Assurance Group of NGGT
Joint Office of Gas Transporters

Appendix
Daily correction factors

Gas date	Measured volume scm	Correct volume scm	Error scm	Correction factor
27/05/2013	39766	41078.4	1312.4	1.033003
28/05/2013	43437	44488.8	1051.8	1.024214
29/05/2013	64188	65478.5	1290.5	1.020105
30/05/2013	70291	72321.4	2030.4	1.028885
31/05/2013	52437	54213.4	1776.4	1.033876
01/06/2013	57332	60079.8	2747.8	1.047928
02/06/2013	44196	46460.1	2264.1	1.051229
03/06/2013	38266	40870.9	2604.9	1.068072
04/06/2013	76680	81226.5	4546.5	1.059292
05/06/2013	43052	46479.6	3427.6	1.079616
06/06/2013	39868	43547.5	3679.5	1.092292
07/06/2013	37154	40194.3	3040.3	1.081831
08/06/2013	51162	55538.3	4376.3	1.085538
09/06/2013	49661	53661.9	4000.9	1.080565
10/06/2013	43197	45921.5	2724.5	1.063072
11/06/2013	31574	33951.0	2377.0	1.075284
12/06/2013	28425	30667.7	2242.7	1.078897
13/06/2013	31860	34089.6	2229.6	1.069981
14/06/2013	31919	34178.6	2259.6	1.070791
15/06/2013	35117	37533.3	2416.3	1.068807
16/06/2013	32994	35297.7	2303.7	1.069823
17/06/2013	30208	32033.1	1825.1	1.060418
18/06/2013	30182	32108.1	1926.1	1.063816
19/06/2013	26982	28735.4	1753.4	1.064985
20/06/2013	29717	31526.3	1809.3	1.060885
21/06/2013	30215	32131.5	1916.5	1.063430
22/06/2013	30537	32728.7	2191.7	1.071771
23/06/2013	31708	34188.2	2480.2	1.078221
24/06/2013	40633	43572.0	2939.0	1.072331
25/06/2013	30193	32283.9	2090.9	1.069250
26/06/2013	30765	33151.5	2386.5	1.077570
27/06/2013	31036	33423.5	2387.5	1.076928
28/06/2013	32109	34372.5	2263.5	1.070496
29/06/2013	28865	30808.0	1943.0	1.067312
30/06/2013	23574	25467.7	1893.7	1.080329
01/07/2013	24525	26517.6	1992.6	1.081248
02/07/2013	26482	28642.9	2160.9	1.081598
03/07/2013	26544	28452.1	1908.1	1.071884
04/07/2013	23721	25536.1	1815.1	1.076517
05/07/2013	22726	24375.2	1649.2	1.072568
06/07/2013	21495	23071.1	1576.1	1.073322
07/07/2013	20606	22214.9	1608.9	1.078078
08/07/2013	23180	24942.5	1762.5	1.076037
09/07/2013	23038	24933.0	1895.0	1.082254
10/07/2013	25213	27545.4	2332.4	1.092509
11/07/2013	27476	30602.6	3126.6	1.113793

12/07/2013	26080	28902.0	2822.0	1.108205
13/07/2013	22486	24687.8	2201.8	1.097917
14/07/2013	22311	24464.8	2153.8	1.096537
15/07/2013	21841	23734.8	1893.8	1.086709
16/07/2013	21446	22666.1	1220.1	1.056892
17/07/2013	20595	22594.3	1999.3	1.097075
18/07/2013	20270	21965.9	1695.9	1.083667
19/07/2013	20286	21887.7	1601.7	1.078956
20/07/2013	21396	23305.2	1909.2	1.089234
21/07/2013	23530	25594.2	2064.2	1.087725
22/07/2013	20930	22825.7	1895.7	1.090572
23/07/2013	20308	22284.2	1976.2	1.097310
24/07/2013	19664	21528.6	1864.6	1.094825
25/07/2013	19828	21748.5	1920.5	1.096860
26/07/2013	19992	21620.0	1628.0	1.081434
27/07/2013	19892	21468.5	1576.5	1.079253
28/07/2013	19270	21139.0	1869.0	1.096990
29/07/2013	20071	21795.0	1724.0	1.085893
30/07/2013	21170	22856.4	1686.4	1.079659
31/07/2013	22840	24624.1	1784.1	1.078114
01/08/2013	20098	21811.7	1713.7	1.085267
02/08/2013	20162	22196.5	2034.5	1.100906
03/08/2013	20228	22302.5	2074.5	1.102555
04/08/2013	20695	21913.0	1218.0	1.058853
05/08/2013	21539	22029.1	490.1	1.022754