

METER ERROR REPORT**FINAL**

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

SITE NAME	Mickle Trafford
LDZ	NW
START DATE (actual)	20 th April 2015
LAST GOOD DATE	20 th April 2015
END DATE	14 th July 2015
SIZE OF ERROR (No reconciliation required if under 0.1%)	163779scm (under read) 0.164%
ESTIMATE – Y/N?	N
ROOT CAUSE	Unknown.
ANALYSIS	HPMIS RBD data
METER TYPE	Orifice plate
AUTHOR	Piers Eldridge
CHECKED BY	Sarah Kimpton
ACCEPTED BY NGGD NETWORK	Andrew Finch

2. BACKGROUND

Gas is supplied to part of the North West Network at Mickle Trafford FWACV offtake. Mickle Trafford is a single stream orifice plate meter site using a gas chromatograph for RD and CV determination and PTZ correction.

During a routine meter validation in July 2015 MTA Low DP transmitter s/n F610HF533 918 failed its calibration check during procedure CP11. Figure 1 shows a screen shot of the test results in HPMIS. The transmitter's zero and span was adjusted and the transmitter subsequently passed the CP11 test.

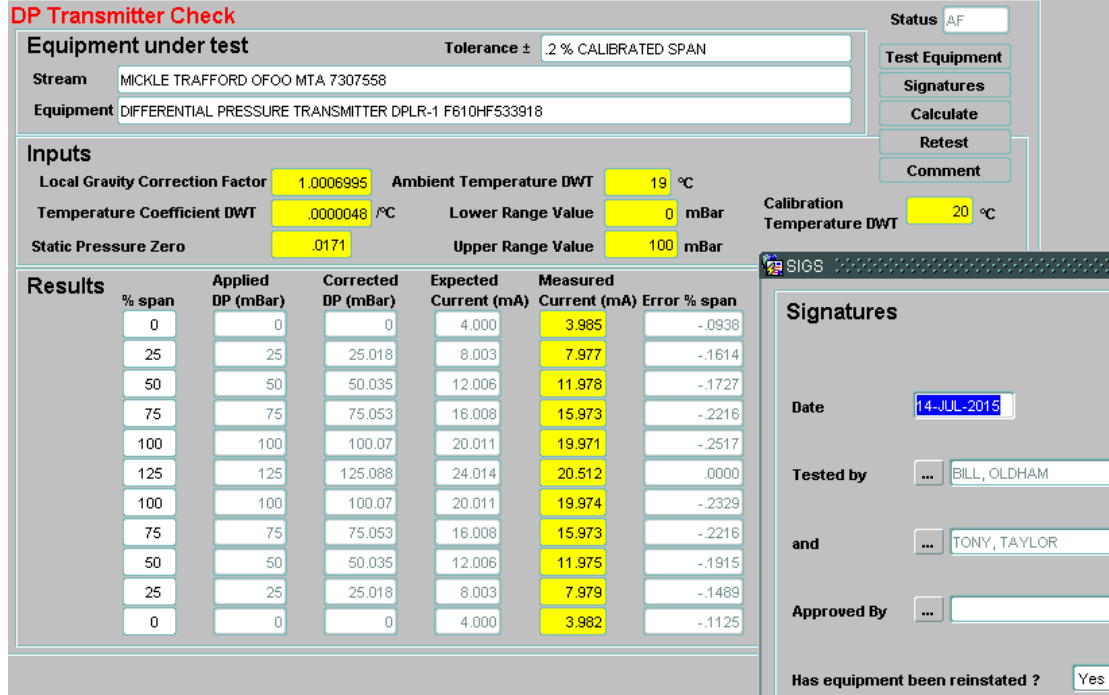


Figure 1 A screen shot and the failed test from HPMIS.

3. ERROR QUANTIFICATION AND IMPACT

RBD data and audit data from Mickle Trafford from the 9th September 2014 to 14th July 2015 has been analysed. Data before the validation in September was not analysed because the site was upgraded between March and September 2014. There was no flow and no data collected between these dates. The pressure transmitter was upgraded and the differential pressure transmitters where re-ranged. Validation data has been used to correct the differential pressures for both the As Left (AL) validation test in September 2014 and the As Found (AF) validation test in July 2015. Where the differential pressure across the plate was less than 100 mbar, the difference between the corrected low range differential pressure measurement (LRDP) and the corrected high range differential pressure measurement (HRDP) has been plotted for both the AL and AF corrections in figure 2. The used differential pressure has been plotted on the secondary axis to show when gas has flowed through the meter. The difference between the LRDP and HRDP has been averaged for each gas day and plotted in figure 3.

It can be seen from the figure 3 that a shift occurred on the 20th April 2015 and the continuation in the drift in the difference between LRDP and HRDP appeared to switch between the AL correction to the AF correction.

A similar analysis has been done with the difference between LRDP and standby differential pressure measurement (SBDP) and the difference between HRDP and SBDP. These are shown in figures 4 and 5.

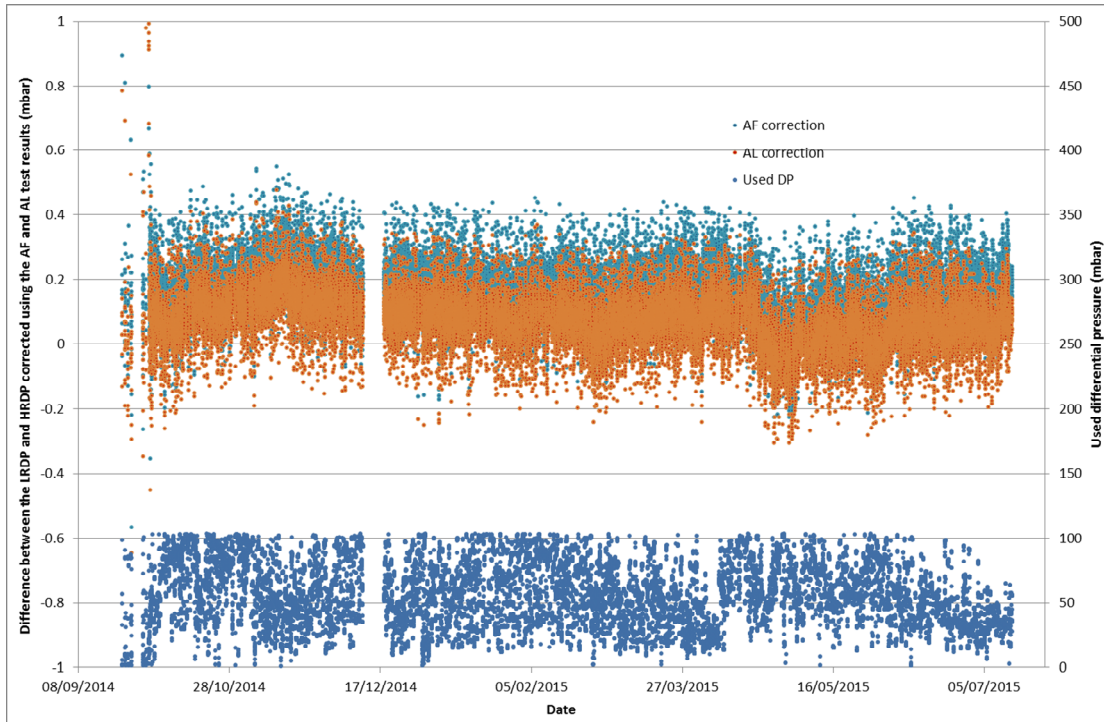


Figure 2 The difference between LRDP and HRDP.

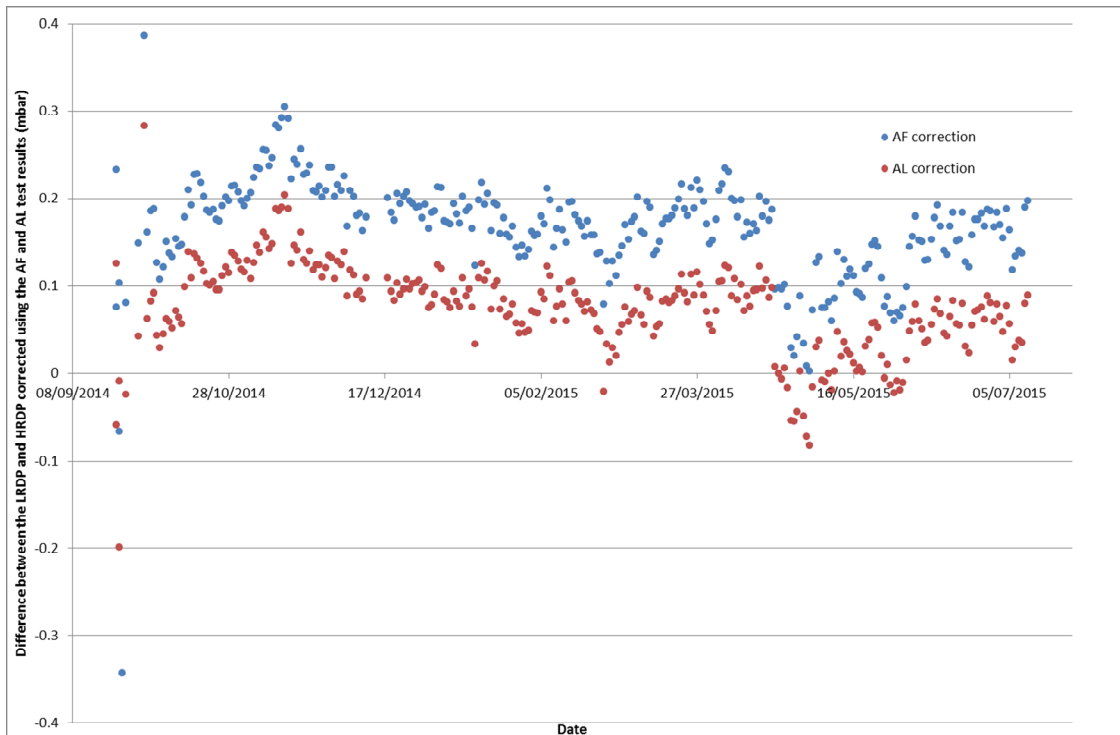


Figure 3 The difference between LRDP and HRDP average for each gas day.

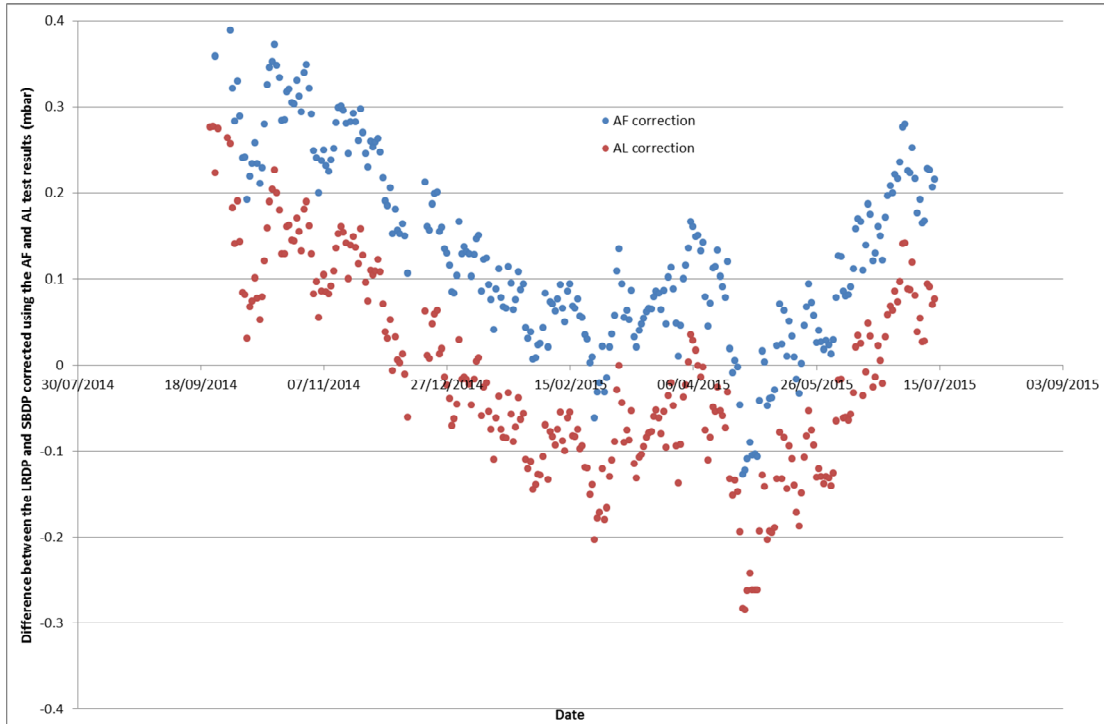


Figure 4 The difference between LRDP and SBDP average for each gas day.

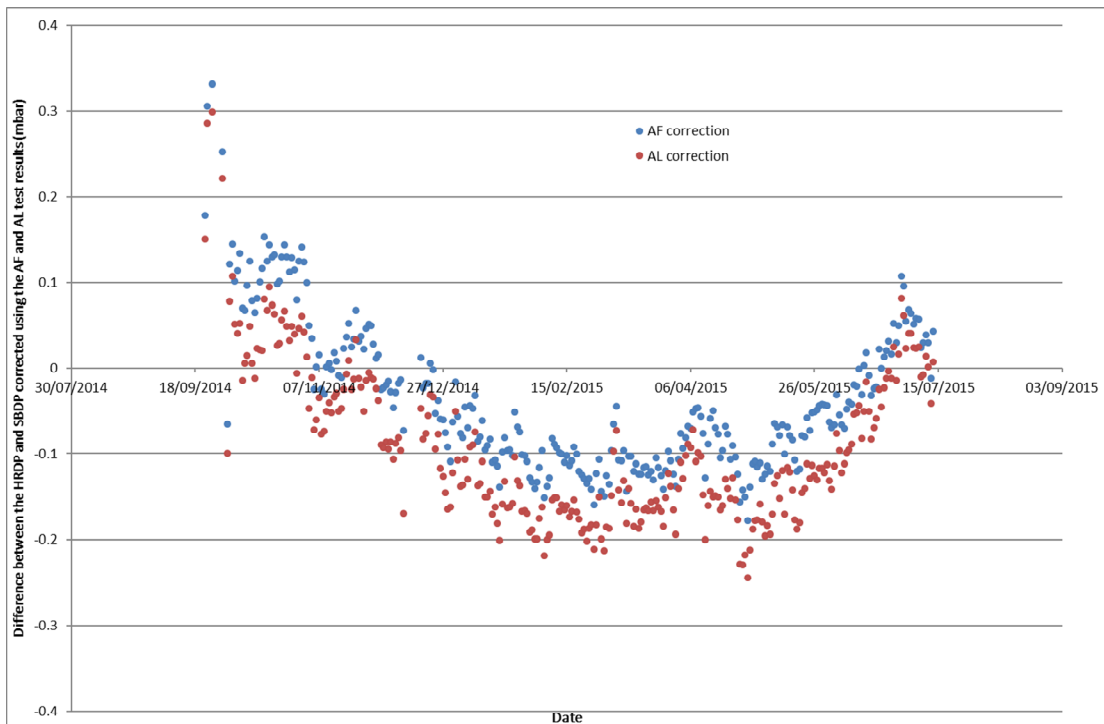


Figure 5 The difference between HRDP and SBDP average for each gas day.

The reconciliation calculated in this report is between 20th April 2015 and the 14th July 2015.

For each Danalyzer cycle where gas has flowed through the meter the flowrate has been re-calculated using a linear correction for the low range differential pressure. A correction factor for each Danalyzer cycle has been calculated and applied to the difference between subsequent volumetric

integrator readings. The daily correction factors are shown in table 1 in the appendix.

4. CAUSES

The cause of the meter error is unknown.

5. RECOMMENDATIONS AND LEARNING

HPMIS (RBD data and validation test results) should continue to be monitored to identify any such future errors.

REFERENCES

ISO 5167
HPMIS database
MER2.xlsm

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>4/09/2015</i>
<i>Rev 2</i>		<i>Piers Eldridge</i>	<i>27/6/2016</i>
<i>Rev 3</i>	<i>Low flow cutoff was applied to the working</i>	<i>Piers Eldridge</i>	<i>15/12/2016</i>

DISTRIBUTION

Asset Owner
Energy Performance
Network Lead Group
Asset Strategy

APPENDIX

Gas day	Error (scm)	Gemini volume (Mscm)	Correction factor
21/04/2015	1496	1.2667	1.0012
22/04/2015	2217	1.1352	1.0020
23/04/2015	2131	1.1291	1.0019
24/04/2015	2177	1.1847	1.0018
25/04/2015	2040	1.2642	1.0016
26/04/2015	2085	1.4051	1.0015
27/04/2015	1939	1.5513	1.0013
28/04/2015	838	1.5714	1.0005
29/04/2015	940	1.2967	1.0007
30/04/2015	1244	1.1855	1.0010
01/05/2015	2034	1.4037	1.0014
02/05/2015	1104	1.6846	1.0007
03/05/2015	2121	1.271	1.0017
04/05/2015	2128	1.1532	1.0018
05/05/2015	1503	1.3373	1.0011
06/05/2015	1007	1.5537	1.0006
07/05/2015	1405	1.4135	1.0010
08/05/2015	1296	1.5546	1.0008
09/05/2015	1315	1.5158	1.0009
10/05/2015	2012	1.3209	1.0015
11/05/2015	2203	1.2014	1.0018
12/05/2015	1966	1.3638	1.0014
13/05/2015	2069	1.1784	1.0018
14/05/2015	2052	1.3444	1.0015
15/05/2015	2145	1.1174	1.0019
16/05/2015	2153	1.0502	1.0020
17/05/2015	2076	1.2437	1.0017
18/05/2015	1420	1.3623	1.0010
19/05/2015	1471	1.4342	1.0010
20/05/2015	1704	1.3503	1.0013
21/05/2015	1942	1.3138	1.0015
22/05/2015	1914	1.288	1.0015
23/05/2015	2075	1.1537	1.0018
24/05/2015	2062	1.1961	1.0017
25/05/2015	1789	1.3169	1.0014
26/05/2015	1516	1.4479	1.0010
27/05/2015	1870	1.4504	1.0013
28/05/2015	2032	1.3601	1.0015
29/05/2015	1780	1.408	1.0013

30/05/2015	1782	1.4286	1.0012
31/05/2015	2086	1.359	1.0015
01/06/2015	1131	1.5167	1.0007
02/06/2015	1416	1.4325	1.0010
03/06/2015	1925	1.1756	1.0016
04/06/2015	2128	1.1007	1.0019
05/06/2015	2129	1.0298	1.0021
06/06/2015	1973	1.1891	1.0017
07/06/2015	1962	1.0764	1.0018
08/06/2015	2008	1.1315	1.0018
09/06/2015	2072	1.1767	1.0018
10/06/2015	2206	1.0803	1.0020
11/06/2015	2169	0.9601	1.0023
12/06/2015	2198	0.914	1.0024
13/06/2015	2096	1.0645	1.0020
14/06/2015	2152	1.2062	1.0018
15/06/2015	2110	1.1872	1.0018
16/06/2015	2184	0.9533	1.0023
17/06/2015	2112	1.0253	1.0021
18/06/2015	2022	1.1422	1.0018
19/06/2015	2060	1.0731	1.0019
20/06/2015	2110	0.9757	1.0022
21/06/2015	1955	1.0815	1.0018
22/06/2015	2165	1.0592	1.0020
23/06/2015	2150	0.9665	1.0022
24/06/2015	2165	0.9322	1.0023
25/06/2015	2128	0.9698	1.0022
26/06/2015	2254	0.9162	1.0025
27/06/2015	2207	0.8881	1.0025
28/06/2015	2098	1.0424	1.0020
29/06/2015	2284	0.9157	1.0025
30/06/2015	2224	0.8401	1.0026
01/07/2015	2205	0.9373	1.0024
02/07/2015	2294	0.8986	1.0026
03/07/2015	2261	0.857	1.0026
04/07/2015	2291	0.8156	1.0028
05/07/2015	2276	0.8546	1.0027
06/07/2015	2120	0.9503	1.0022
07/07/2015	2154	0.9328	1.0023
08/07/2015	2162	0.9706	1.0022
09/07/2015	2138	1.0071	1.0021
10/07/2015	2338	0.8458	1.0028
11/07/2015	2282	0.8953	1.0025
12/07/2015	2234	0.907	1.0025
13/07/2015	1776	0.7658	1.0023

14/07/2015	318	0.6791	1.0005
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Table 1 The summary of the errors and the daily correction factors.