

METER ERROR REPORT**FINAL**

Reconcile?	Y
------------	---

Safety Issue?	N
---------------	---

Thesis Report No.	
-------------------	--

1. EXECUTIVE SUMMARY

SITE NAME	Royston	
LDZ	EA	
START DATE (actual)	27 th June 2009	
LAST GOOD DATE		
END DATE	14 th October 2010	
SIZE OF ERROR (No reconciliation required if under 0.1%)	444805scm over read (1.09%)	
ESTIMATE – Y/N?	N	
ROOT CAUSE	The Tracker was upgraded to a chromatograph. The Tracker was decommissioned in 27th July 2009 but the chromatograph that was installed to replace the Tracker did not function correctly until 14th October 2010.	
ANALYSIS	Recalculation of volumes using an average of CV, RD and CO2 measured at Great Wilbraham and Whitwell.	
METER TYPE	Turbine	
AUTHOR	Piers Eldridge	
CHECKED BY	Andy Finch	
RECONCILIATION	Distribution	Transportation

2. BACKGROUND

Royston is a dual turbine meter stream site using a Tracker for PTZ correction.

The Tracker at Royston was replaced with a chromatograph. On the 27th July 2009 the Tracker was decommissioned and Trint was stopped. The chromatograph was installed in 2010. While live composition was not measured, the flow computer was left with fixed values for CV, RD and CO₂.

The following table shows a timeline of the events that effected the data collection and flow measurement.

27/07/2009	Tracker decommissioned and Trint disabled.
29/07/2009	Trint turned on
31/07/2009	New values entered for CV, RD and CO ₂
06/04/2010	Allen Bradley upgraded to Siemens Microbox
08/06/2010	Trint configuration erroneously changed to 2 orifice plate meters
07/10/2010	Trint configuration reverted to 2 turbines meters
14/10/2010	AGA8 GC changed to DC

Table 1 - MER events.

When the Tracker was decommissioned it was apparent that a MER might be necessary.

3. ERROR QUANTIFICATION AND IMPACT

The density was re-calculated using the AGA8 (Gross Characterisation method) using an average of CV, RD and CO₂ measured at Great Wilbraham and Whitwell. The recalculated density was compared with that calculated using the applied fixed factors to provide an error against each Trint cycle dataset. The daily errors were used to calculate daily correction factors which are supplied in Table 2 in the Appendix. Detailed calculation results can be found in the accompanying spreadsheets.

4. CAUSES

The metering error was caused by removing the Tracker which resulted in fixed values for CV, RD and CO₂ being resident in the Omni Flow Computer.

On this occasion, the Tracker's physical footprint was required to install the new chromatograph. Therefore the entire Tracker cabinet had to be demolished and a new concrete base cast before the chromatograph kiosk could be installed. Due to physical limitations at site, it was not considered safe to provide a temporary solution in the interim period.

5. RECOMMENDATIONS AND LEARNING

The daily volumes should be reconciled as per Table 2 in the Appendix. Taking individual physical site layout and safety considerations into account, the impact on the dependent metering system should continue to be carefully considered as part of the planning of site upgrades. Where possible, temporary restoration of facilities should always be considered and/or downtime minimised.

REFERENCES

2009.xls
2010.xls
Summary.xls

VERSION HISTORY

<i>Version</i>	<i>Changes</i>	<i>Author</i>	<i>Date</i>
<i>0</i>	<i>Original</i>	<i>Piers Eldridge</i>	<i>1st June 2011</i>

DISTRIBUTION

Joint Office of Gas Transporters

National Grid Gas Transmission – Measurement Assurance Group

National Grid Gas Distribution

Appendix 1

Table 2 - Daily Correction Factors

Gas Date	Daily correction factor	
27/07/2009	1.0011	
28/07/2009	1.0000	Data missing
29/07/2009	0.9513	
30/07/2009	0.9819	
31/07/2009	0.9893	
01/08/2009	0.9600	
02/08/2009	0.9495	
03/08/2009	0.9824	
04/08/2009	0.9923	
05/08/2009	0.9938	
06/08/2009	0.9881	
07/08/2009	0.9653	
08/08/2009	0.9719	
09/08/2009	0.9765	
10/08/2009	0.9763	
11/08/2009	0.9668	
12/08/2009	1.0000	Data missing
13/08/2009	0.9687	
14/08/2009	1.0000	Data missing
15/08/2009	1.0000	Data missing
16/08/2009	1.0000	Data missing
17/08/2009	0.9568	
18/08/2009	0.9564	
19/08/2009	0.9536	
20/08/2009	0.9529	
21/08/2009	0.9591	
22/08/2009	0.9629	
23/08/2009	0.9522	
24/08/2009	0.9510	
25/08/2009	0.9595	
26/08/2009	0.9664	
27/08/2009	0.9650	
28/08/2009	0.9844	
29/08/2009	0.9752	
30/08/2009	0.9679	
31/08/2009	0.9663	
01/09/2009	0.9737	
02/09/2009	0.9810	
03/09/2009	0.9844	
04/09/2009	0.9787	
05/09/2009	0.9784	
06/09/2009	0.9706	
07/09/2009	0.9750	
08/09/2009	0.9877	
09/09/2009	0.9949	
10/09/2009	0.9931	
11/09/2009	1.0042	

Gas Date	Daily correction factor	
26/02/2010	0.9985	
27/02/2010	0.9981	
28/02/2010	0.9984	
01/03/2010	0.9977	
02/03/2010	0.9993	
03/03/2010	1.0042	
04/03/2010	1.0022	
05/03/2010	1.0011	
06/03/2010	1.0025	
07/03/2010	1.0000	Data missing
08/03/2010	1.0034	
09/03/2010	1.0056	
10/03/2010	1.0035	
11/03/2010	0.9969	
12/03/2010	0.9985	
13/03/2010	0.9968	
14/03/2010	0.9993	
15/03/2010	1.0000	
16/03/2010	0.9993	
17/03/2010	0.9997	
18/03/2010	0.9997	
19/03/2010	0.9956	
20/03/2010	0.9966	
21/03/2010	0.9975	
22/03/2010	0.9983	
23/03/2010	0.9966	
24/03/2010	0.9962	
25/03/2010	0.9979	
26/03/2010	0.9965	
27/03/2010	0.9970	
28/03/2010	0.9923	
29/03/2010	0.9932	
30/03/2010	0.9942	
31/03/2010	0.9957	
01/04/2010	0.9933	
02/04/2010	0.9894	
03/04/2010	0.9946	
04/04/2010	0.9948	
05/04/2010	0.9966	
06/04/2010	0.9970	
07/04/2010	0.9967	
08/04/2010	0.9946	
09/04/2010	0.9893	
11/04/2010	1.0000	Data missing
12/04/2010	1.0265	
13/04/2010	1.0463	
14/04/2010	1.0459	

Y:\Shared\THJI02\Teamdata\GASQUALMETERING>Error Reports\Meter Error Reports\UKD error reports\MER UKD17811 Royston\MER178 Royston.doc

01/06/2011

12/09/2009	1.0070	
13/09/2009	1.0113	
14/09/2009	0.9977	
15/09/2009	0.9882	
16/09/2009	0.9708	
17/09/2009	0.9746	
18/09/2009	0.9841	
19/09/2009	0.9848	
20/09/2009	0.9821	
21/09/2009	0.9766	
22/09/2009	0.9775	
23/09/2009	0.9757	
24/09/2009	0.9770	
25/09/2009	0.9817	
26/09/2009	0.9786	
27/09/2009	0.9792	
28/09/2009	0.9841	
29/09/2009	0.9844	
30/09/2009	0.9727	
01/10/2009	0.9858	
02/10/2009	0.9899	
03/10/2009	0.9834	
05/10/2009	0.9887	
06/10/2009	0.9864	
07/10/2009	0.9872	
08/10/2009	0.9867	
09/10/2009	0.9867	
10/10/2009	0.9782	
11/10/2009	0.9845	
12/10/2009	0.9920	
13/10/2009	0.9910	
14/10/2009	0.9940	
15/10/2009	0.9883	
16/10/2009	0.9759	
17/10/2009	0.9787	
18/10/2009	0.9828	
19/10/2009	0.9931	
20/10/2009	0.9923	
21/10/2009	0.9994	
22/10/2009	0.9948	
23/10/2009	0.9916	
24/10/2009	0.9919	
25/10/2009	0.9957	
26/10/2009	0.9981	
27/10/2009	0.9900	
28/10/2009	0.9950	
29/10/2009	0.9866	
30/10/2009	0.9790	
31/10/2009	0.9830	
01/11/2009	0.9923	
02/11/2009	0.9855	
03/11/2009	0.9829	

15/04/2010	1.0362	
16/04/2010	1.0339	
17/04/2010	1.0249	
18/04/2010	1.0319	
19/04/2010	1.0069	
20/04/2010	0.9638	
21/04/2010	0.9635	
22/04/2010	0.9869	
23/04/2010	0.9964	
26/04/2010	0.9897	
27/04/2010	0.9929	
28/04/2010	0.9910	
29/04/2010	0.9926	
30/04/2010	0.9885	
01/05/2010	0.9810	
02/05/2010	0.9846	
03/05/2010	0.9957	
04/05/2010	1.0024	
05/05/2010	1.0050	
06/05/2010	0.9981	
07/05/2010	0.9965	
08/05/2010	0.9939	
09/05/2010	1.0012	
10/05/2010	1.0021	
11/05/2010	1.0000	
12/05/2010	0.9982	
13/05/2010	0.9975	
14/05/2010	0.9978	
15/05/2010	0.9976	
16/05/2010	0.9966	
17/05/2010	0.9978	
18/05/2010	1.0112	
19/05/2010	1.0137	
20/05/2010	1.0069	
21/05/2010	1.0075	
31/05/2010	1.0000	Data missing
01/06/2010	1.0000	Data missing
02/06/2010	0.9984	
03/06/2010	1.0023	
07/06/2010	1.0000	Data missing
08/06/2010	1.0008	
09/06/2010	1.0004	
10/06/2010	1.0116	
11/06/2010	1.0134	
12/06/2010	1.0027	
13/06/2010	0.9996	
14/06/2010	1.0013	
15/06/2010	1.0058	
16/06/2010	1.0065	
17/06/2010	1.0055	
18/06/2010	1.0089	
19/06/2010	1.0069	

Y:\Shared\THJI02\Teamdata\GASQUALMETERING>Error Reports\Meter Error Reports\UKD error reports\MER UKD17811 Royston\MER178 Royston.doc

01/06/2011

04/11/2009	0.9887	
05/11/2009	0.9892	
06/11/2009	0.9957	
07/11/2009	0.9861	
08/11/2009	0.9910	
09/11/2009	0.9927	
10/11/2009	0.9929	
11/11/2009	0.9877	
12/11/2009	0.9872	
13/11/2009	0.9908	
14/11/2009	0.9917	
15/11/2009	0.9911	
16/11/2009	0.9876	
17/11/2009	0.9810	
18/11/2009	0.9835	
19/11/2009	0.9842	
20/11/2009	0.9879	
21/11/2009	0.9868	
22/11/2009	0.9913	
23/11/2009	0.9921	
24/11/2009	0.9898	
25/11/2009	0.9744	
26/11/2009	0.9833	
27/11/2009	0.9889	
28/11/2009	0.9800	
29/11/2009	0.9882	
30/11/2009	0.9895	
01/12/2009	0.9914	
02/12/2009	0.9907	
03/12/2009	0.9836	
04/12/2009	0.9831	
05/12/2009	0.9882	
06/12/2009	0.9876	
07/12/2009	0.9891	
08/12/2009	0.9897	
09/12/2009	0.9895	
10/12/2009	0.9910	
11/12/2009	0.9866	
12/12/2009	0.9876	
13/12/2009	0.9909	
14/12/2009	0.9849	
15/12/2009	0.9819	
16/12/2009	0.9833	
17/12/2009	0.9913	
18/12/2009	0.9899	
19/12/2009	0.9822	
20/12/2009	0.9805	
21/12/2009	0.9766	
22/12/2009	0.9706	
23/12/2009	0.9717	
24/12/2009	0.9740	
25/12/2009	0.9827	

20/06/2010	1.0096	
21/06/2010	1.0115	
22/06/2010	1.0054	
23/06/2010	1.0035	
24/06/2010	1.0018	
25/06/2010	1.0030	
26/06/2010	1.0033	
27/06/2010	1.0010	
28/06/2010	1.0013	
29/06/2010	1.0062	
30/06/2010	1.0050	
01/07/2010	1.0011	
02/07/2010	1.0022	
03/07/2010	1.0006	
04/07/2010	0.9987	
05/07/2010	0.9982	
06/07/2010	0.9964	
07/07/2010	0.9947	
08/07/2010	0.9941	
09/07/2010	1.0070	
10/07/2010	1.0050	
11/07/2010	0.9922	
12/07/2010	0.9890	
13/07/2010	0.9890	
14/07/2010	0.9848	
15/07/2010	0.9881	
16/07/2010	0.9825	
17/07/2010	0.9836	
18/07/2010	0.9830	
19/07/2010	0.9779	
20/07/2010	0.9769	
21/07/2010	0.9772	
22/07/2010	0.9751	
23/07/2010	0.9738	
24/07/2010	0.9751	
25/07/2010	0.9785	
26/07/2010	0.9761	
27/07/2010	0.9818	
28/07/2010	1.0000	
29/07/2010	0.9967	
30/07/2010	1.0049	
31/07/2010	0.9979	
01/08/2010	0.9953	
02/08/2010	0.9909	
03/08/2010	0.9925	
04/08/2010	1.0006	
05/08/2010	1.0028	
06/08/2010	1.0048	
07/08/2010	0.9998	
08/08/2010	1.0055	
09/08/2010	1.0039	
10/08/2010	0.9989	

Y:\Shared\THJI02\Teamdata\GASQUALMETERING>Error Reports\Meter Error Reports\UKD error reports\MER UKD17811 Royston\MER178 Royston.doc

01/06/2011

26/12/2009	0.9858	
27/12/2009	0.9864	
28/12/2009	0.9843	
29/12/2009	0.9814	
30/12/2009	0.9792	
31/12/2009	0.9728	
01/01/2010	0.9704	
02/01/2010	0.9752	
03/01/2010	0.9639	
04/01/2010	0.9663	
05/01/2010	0.9677	
06/01/2010	0.9852	
07/01/2010	0.9878	
08/01/2010	0.9707	
09/01/2010	0.9713	
10/01/2010	0.9686	
11/01/2010	0.9751	
12/01/2010	0.9742	
13/01/2010	0.9792	
14/01/2010	0.9783	
15/01/2010	0.9772	
16/01/2010	0.9782	
17/01/2010	0.9803	
18/01/2010	0.9789	
19/01/2010	0.9819	
20/01/2010	0.9857	
21/01/2010	0.9819	
22/01/2010	0.9787	
23/01/2010	0.9812	
24/01/2010	0.9819	
25/01/2010	0.9846	
26/01/2010	0.9837	
27/01/2010	0.9816	
28/01/2010	0.9802	
29/01/2010	0.9822	
30/01/2010	0.9839	
31/01/2010	0.9761	
01/02/2010	0.9779	
02/02/2010	0.9806	
03/02/2010	0.9775	
04/02/2010	0.9826	
05/02/2010	0.9809	
06/02/2010	0.9804	
07/02/2010	0.9789	
08/02/2010	0.9793	
09/02/2010	0.9792	
10/02/2010	0.9777	
11/02/2010	0.9775	
12/02/2010	0.9783	
13/02/2010	0.9827	
14/02/2010	0.9828	
15/02/2010	0.9842	

11/08/2010	1.0003	
12/08/2010	0.9991	
13/08/2010	1.0005	
14/08/2010	0.9977	
15/08/2010	1.0008	
16/08/2010	0.9994	
17/08/2010	0.9971	
18/08/2010	0.9997	
19/08/2010	0.9985	
20/08/2010	1.0023	
21/08/2010	1.0040	
22/08/2010	0.9966	
23/08/2010	0.9992	
24/08/2010	1.0016	
25/08/2010	1.0005	
26/08/2010	0.9996	
27/08/2010	0.9976	
28/08/2010	0.9971	
29/08/2010	1.0020	
30/08/2010	0.9949	
31/08/2010	0.9995	
01/09/2010	1.0064	
02/09/2010	1.0013	
03/09/2010	0.9966	
04/09/2010	1.0000	
05/09/2010	0.9999	
06/09/2010	1.0038	
07/09/2010	1.0023	
08/09/2010	1.0099	
09/09/2010	1.0048	
10/09/2010	0.9980	
11/09/2010	0.9983	
12/09/2010	0.9947	
13/09/2010	0.9957	
14/09/2010	1.0026	
15/09/2010	1.0000	
16/09/2010	0.9966	
17/09/2010	0.9955	
18/09/2010	1.0014	
19/09/2010	0.9984	
20/09/2010	0.9975	
21/09/2010	0.9967	
22/09/2010	0.9982	
23/09/2010	0.9974	
24/09/2010	0.9979	
25/09/2010	0.9966	
26/09/2010	0.9959	
27/09/2010	0.9950	
28/09/2010	0.9976	
29/09/2010	0.9990	
30/09/2010	1.0034	
04/10/2010	1.0008	

16/02/2010	0.9787	
17/02/2010	0.9821	
18/02/2010	0.9829	
19/02/2010	0.9938	
20/02/2010	0.9925	
21/02/2010	0.9951	
22/02/2010	0.9912	
23/02/2010	0.9968	
24/02/2010	0.9999	
25/02/2010	1.0013	

05/10/2010	0.9977	
06/10/2010	0.9985	
07/10/2010	1.0000	Data missing
08/10/2010	0.9978	
09/10/2010	0.9979	
10/10/2010	0.9973	
11/10/2010	0.9984	
12/10/2010	0.9956	
13/10/2010	0.9983	
14/10/2010	0.9992	