NULL METER ERROR REPORT

FINAL

Reconcile?	N
Safety Issue?	Y
Thesis Report No.	

1. EXECUTIVE SUMMARY

SITE NAME	Weston Point NTS to LDZ Offtake
LDZ	NW
START DATE (actual)	25th August 2015
LAST GOOD DATE	25th August 2015
END DATE	14th September 2015
SIZE OF ERROR (No reconciliation required if under 0.1%)	-0.038%
ESTIMATE – Y/N?	Y
ROOT CAUSE	Incorrect parameters were deployed in the flow computer configuration serving the Weston Point NTS to LDZ offtake following a metering separation modification project.
ANALYSIS	HPMIS RBD data
METER TYPE	Orifice plate
AUTHOR	Piers Eldridge
CHECKED BY	Catherine Jones
ACCEPTED BY NGGD NETWORK	Andrew Finch

2. BACKGROUND

Gas is supplied to part of the North West Network at the Weston Point NTS to LDZ FWACV offtake. Weston Point is a single stream orifice plate meter site using a gas chromatograph for RD and CV determination and PTZ correction. Before 25th August 2015 the flow computer was shared between NGGD and NGGT. The flow computer was configured with meter stream 1 as Weston Point MTA and meter stream 2 as an industrial load known as ICI Runcorn MTB. The ICI Runcorn metering system was upgraded and respective plant signals and flow calculations were transferred to a separate dedicated flow computer. The flow computer for Weston Point MTB was then reconfigured to a single meter stream and the new configuration was developed from an old configuration saved on 1st October 2013. The orifice plate was changed on 29th July 2014. The parameters used in the resulting flow computer configuration were not compared to relevant site documents and certificates prior to the site acceptance tests. Therefore incorrect values were used for Meter #1 Entered Isentropic Exponent, Meter #1 Reference Orifice Diameter and Meter #1 Orifice Reference Temperature. The incorrect configuration was discovered and corrected during a T/PR/ME/2 parts 1 to 3 validation on the 14th September 2015.

3. ERROR QUANTIFICATION AND IMPACT

Gas properties from Weston Point's audit data from the 25th August 2015 to 14th September 2015 have been averaged and are shown in Table 2 in the appendix. The minimum, maximum and average meter temperatures, pressures and used differential pressure from Weston Point's RBD data from the 25th August 2015 to 14th September 2015 have been determined. The incorrect flowrates using the values from the flow computer configuration and the correct flowrates have been calculated using the average composition at the minimum, maximum and average operating conditions. The flowrates and corresponding errors are shown in Table 1.

	Min	Max	Average
Differential pressure (mbar)	0.20	0.95	0.58
Pressure (bar.g)	57.78	60.77	58.89
Temperature (°C)	12.13	24.37	13.58

Correct flowrate (scm/h)	2760.15	6025.46	4776.74
Incorrect flowrate (scm/h)	2759.10	6023.15	4774.91
Error (scm/h)	-1.06	-2.30	-1.83
Error (%)	**-0.03823%**	**-0.03821%**	**-0.03821%**

Table 1 recalculated flowrates and errors.

4. CAUSES

Incorrect parameters were deployed in the flow computer configuration serving the Weston Point NTS to LDZ offtake following a metering separation modification project.

5. RECOMMENDATIONS AND LEARNING

The worst case error during the period of the meter error is -0.03823%, therefore no reconciliation is required.

The parameters deployed in the flow computer should be compared to relevant site documents, certificates, live computer configurations prior to the site acceptance tests. In the event of any confusion, appropriate discussion with the relevant parties should be sought.

REFERENCES

ISO 5167
HPMIS database
MER.xlsm

VERSION HISTORY

Version	*Changes*	*Author*	*Date*
Rev 1	*Final*	*Piers Eldridge*	*30/09/2015*
Rev 2	*Andy Finch's comments have been included.*	*Piers Eldridge*	*09/10/2015*
Rev 3	*Reconcile field on the front page changed to no.*	*Piers Eldridge*	*27/06/2016*

DISTRIBUTION

Asset Owner
Energy Performance
Measurement and Process
Asset Strategy

APPENDIX

	Average
Neo+IC5 (mol %)	0.0907
HEXANE (mol %)	0.0566
PROPANE (mol %)	2.4650
I BUTANE (mol %)	0.3226
N BUTANE (mol %)	0.5540
N PENTANE (mol %)	0.0803
NITROGEN (mol %)	2.7324
METHANE (mol %)	86.0594
CARBON DIOXIDE (mol %)	1.3621
ETHANE (mol %)	6.2770
NEO PENTANE (mol %)	0.0018
I PENTANE (mol %)	0.0888
Calorific value (MJ/scm)	40.4408
Relative density	0.6515

Table 2. Average composition from Weston Point between 25th August 2015 and 14th September 2015