METER ERROR REPORT

FINAL

Reconcile?	Y
Safety Issue?	N
Thesis Report No.	

1. EXECUTIVE SUMMARY

SITE NAME		Aylesbeare	
LDZ		SW	
START DATE (actual)		24th October 2010 (13:08)	
END DATE		24th October 2010 (18:02)	
ation	53,392.26 S	392.26 SCM over registration	
SIZE OF ERROR (No reconciliation required if under 0.1%)		(equivalent to 6.886%)	
	(
ROOT CAUSE		Pressure transducer locked up.	
ANALYSIS		HPMIS RBD Data	
		Orifice Plate	
	S Western		
	C Stock		
	1		
Distribution		Transportation	
	tion	Aylesbeare SW 24th October 24th October 33,392.26 S (equivalent Pressure tra HPMIS RB Orifice Plate S Western C Stock	

2. BACKGROUND

Gas is supplied to part of the South West LDZ, Wales & West Utilities Network, at Aylesbeare FWACV offtake. The site metering system comprises a single Orifice meter with an isolated bypass.

During a period of 4hr 54mins (13:08 to 18:02) on Gas Day 24th October 2010, for some undiscovered reason the pressure transducer locked. This caused the standard flow rate to be incorrectly calculated. The condition was rectified by turning the power to the instrument off and then back on again.

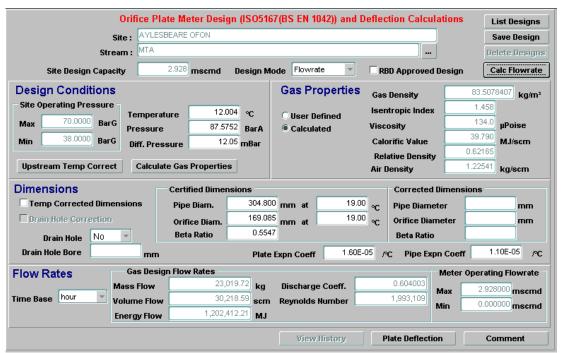
3. ERROR QUANTIFICATION AND IMPACT

The RBD data was reviewed before and after the pressure transducer (PT) locked up. The PT readings, 5 prior and 5 after, were averaged to estimate the actual pressure reading during the period of the PT locking up. See spreadsheet.

Using the HPMIS orifice plate design calculation (See Fig. 1a & 1b) together with the 4 minute RBD and gas composition data the volume flow for each 4/5 minute period was calculated. In each instance, the volume flows for the locked up PT and the estimated PT reading were calculated. By comparing these calculated flows over the period of the PT locking up it was estimated that orifice metering system over-registered 53,392.26 scm of gas.

From HPMIS, the Dvol for Gas Day the 24th of October 2010 was 0.775372mscm so the over-registration equates to 6.886% of Dvol. See spreadsheet.

Fig. 1a - HPMIS screen shot for flow calculation using locked pressure value (13:08).



Orifice Plate Meter Design (ISO5167(BS EN 1042)) and Deflection Calculations List Designs AYLESBEARE OF ON Save Design MTA Delete Designs Stream: 2.928 **mscmd** Calc Flowrate Design Mode Flowrate RBD Approved Design Site Design Capacity **Gas Properties** 44.5503427 kg/m³ **Design Conditions** Gas Density Site Operating Pressure 12.004 **℃** Isentropic Index Temperature User Defined 70.0000 BarG 51.3570 BarA μPoise Viscosity Calculated 38.0000 12.05 mBar BarG Min Calorific Value MJ/scm Diff. Pressure Relative Density Upstream Temp Correct **Calculate Gas Properties** Air Density **Dimensions Certified Dimensions Corrected Dimensions** 304.800 mm at 19.00 Temp Corrected Dimensions Pipe Diam. Pipe Diameter mm 169.085 mm at 19.00 ☐ Drain Hole Correction Orifice Diam. **Orifice Diameter** mm 0.5547 Beta Ratio Beta Ratio Drain Hole Drain Hole Bore 1.60E-05 PC Pipe Expn Coeff 1.10E-05 /**℃** Plate Expn Coeff Gas Design Flow Rates Flow Rates **Meter Operating Flowrate** 16.814.59 0.604059 Mass Flow ka Discharge Coeff. 2.928000 **mscmd** Max Time Base hour 1.672.424 22.072.94 Revnolds Number Volume Flow scm 0.000000 mscmd Min 878,293.15 **Energy Flow** MJ

Fig. 1b - HPMIS screen shot for flow calculation using calculated average pressure value (13:08).

4. RECOMMENDATIONS AND LEARNING

A review of historical faults associated with the locking up of PT's has been conducted with a programme proposed for the installation of new PT's.

View History

Plate Deflection

Comment

HPMIS (RBD data) should be monitored to identify any such future errors

REFERENCES

ISO 5167

HPMIS database

VERSION HISTORY

Version	Changes	Author	Date
Rev0	First issue	S Western	24/12/10
Rev1	First issue	S Western	06/01/11