METER ERROR REPORT

FINAL

Reconcile?	Y	
Safety Issue?	N	
Thesis Report No.		

1. EXECUTIVE SUMMARY

SITE NAME		Aylesbeare		
LDZ		SW		
START DATE (actual)		11th May 2010 (01:12)		
LAST GOOD DATE				
END DATE		11th May 2010 (02:47)		
SIZE OF ERROR (No reconciliation required if under 0.1%)		7,034.72 SCM over registration (equivalent to 1.129%)		
ESTIMATE – Y/N?		(equivalent	1.127/0)	
ROOT CAUSE		Pressure transducer locked in over range state		
ANALYSIS		HPMIS RBD Data		
METER TYPE		Orifice Plate		
AUTHOR		S Western		
CHECKED BY		C Stock		
ACCEPTED BY UKD NETWORK				
RECONCILIATION	Distribut	ion	Transportation	

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 1hr 35mins (01:12 to 02:47) on Gas Day 11th May 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.

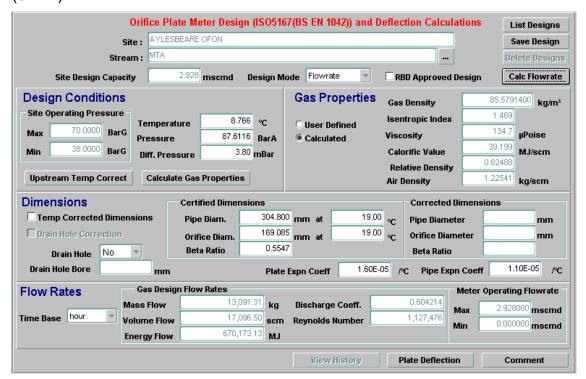
3. ERROR QUANTIFICATION AND IMPACT

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 3/4/5 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 7,034.72 scm of gas.

From HPMIS, the Dvol for Gas Day the 11th of May 2010 was 0.622946mscm so the over-registration equates to 1.129% of Dvol. See spreadsheet.

Fig. 1a - HPMIS screen shot for flow calculation using locked pressure value (01:12).



Min

Comment

Plate Deflection

Orifice Plate Meter Design (ISO5167(BS EN 1042)) and Deflection Calculations List Designs AYLESBEARE OFON Save Design Stream: MTA Design Mode Flowrate Site Design Capacity 2.928 **mscmd** RBD Approved Design Calc Flowrate **Gas Properties Design Conditions** 48.5028955 **kg/m³ Gas Density** Site Operating Pressure 8.766 **∘c** Isentropic Index Temperature User Defined 117.9 BarG 54.3244 BarA Viscosity **uPoise** Pressure Calculated 39.199 38.0000 BarG 3.80 mBar Calorific Value MJ/scm Diff. Pressure 0.62488 Relative Density 1.22541 **kg/scm Upstream Temp Correct Calculate Gas Properties** Air Density **Dimensions Certified Dimensions Corrected Dimensions** 19.00 ℃ Temp Corrected Dimensions 304.800 mm at Pipe Diam. Pipe Diameter mm 169.085 mm at 19.00 **℃** ☐ Drain Hole Correction Orifice Diameter Orifice Diam. mm 0.5547 **Beta Ratio** Beta Ratio Drain Hole **Drain Hole Bore** 1.60E-05 /°C Pipe Expn Coeff 1.10E-05 mm Plate Expn Coeff Gas Design Flow Rates **Meter Operating Flowrate** Flow Rates 9,856.68 0.604287 Discharge Coeff. Mass Flow kg 2.928000 mscmd Max Time Base hour 12,872.26 970.093 Volume Flow Revnolds Number 0.0000000 **mscmd** scm

Fig. 1b - HPMIS screen shot for flow calculation using calculated average pressure value (01:12).

4. RECOMMENDATIONS AND LEARNING

Energy Flow

HPMIS (RBD data) should be monitored to identify any such future errors. Should the error re-occur an assessment of the transmitter may be required to ensure its integrity.

504,585.34

M.I

View History

REFERENCES

ISO 5167

HPMIS database

VERSION HISTORY

Version	Changes	Author	Date
Rev0	First issue	S Western	25/06/10