METER ERROR REPORT

FINAL

Reconcile?	Y
Safety Issue?	Y/N
Thesis Report No.	

1. EXECUTIVE SUMMARY

SITE NAME	Ganstead	
LDZ	NO	
START DATE (actual)	3rd December 2008 (12:04)	
LAST GOOD DATE		
END DATE	30th December 2008 (10:51)	
SIZE OF ERROR (No reconciliation required if under 0.1%)	0.5320 % under-registration	
ESTIMATE – Y/N?		
ROOT CAUSE	Object in pipe caused damage to orifice plate.	
ANALYSIS	Comparison of discharge coefficient of new and damaged plates at Flow Centre.	
METER TYPE	Orifice	
AUTHOR	B. Kirkman	
CHECKED BY	A. Niazi	
ACCEPTED BY NETWORK	M. Alderson	
RECONCILIATION	Distribution	Transportation

2. BACKGROUND

Ganstead is a single orifice plate meter stream site using a gas chromatograph for RD and CV determination and PTZ correction. A power disruption on 3rd December 2008 caused the OMNI flow computer to allow the control valves to open fully, drastically increasing the flow through the site. The differential pressure (DP) across the orifice plate rose sharply and flat-lined at 1050 mbar on the instrumentation. Following this extreme DP rise the orifice plate was taken out and checked for any damage that may have been caused by the increased flow rate. It was found that a large dent had been put in the plate by some object that had been blown down the pipe. The plate was removed on 30th December 2008 for recalibration, and a new plate was manufactured to replace the damaged one.

3. ERROR QUANTIFICATION AND IMPACT

A new plate (s/n 147-4) was manufactured with similar dimensions to the damaged plate (s/n 147/2-Ganstead). The two plates were calibrated against a reference turbine meter at GL's UKAS accredited Flow Centre (refer to GL Reports[1][2] for further details).

The average discharge coefficient for the new plate was 0.603413 and for the damaged plate was 0.606623.

The average discharge coefficient for the new plate is 0.5320% lower than that for the damaged plate, therefore the error is an under-registration of 0.5320%.

4. CAUSES

A power disruption on 3rd December 2008 caused the OMNI flow computer to allow the control valves to open fully, drastically increasing the flow through the site. An object passed through the orifice plate causing damage resulting in subsequent incorrect measurement of flow rates through the meter.

5. RECOMMENDATIONS AND LEARNING

It is recommended that the under-registration is reconciled using a correction factor of 1.005320 applied to the daily volume and energy totals between 3rd and 30th December (inclusive). There was a possibility of gas passing into the system with reduced levels of odorant due to the under-registration of flowrates.

REFERENCES

HPMIS Database

[1] GL Report 9138 - *Ganstead orifice plate damage investigation*, 26 June 2009

[2] GL Report 9308 - *Ganstead orifice plate damage investigation re-test*, 24 Aug 2009

VERSION HISTORY

Version	*Changes*	*Author*	*Date*
O	*First Issue*	*B. Kirkman*	*04/09/09*

DISTRIBUTION

United Utilities