



# Measurement Error Report

**Thyson Technology**

**MER/CAD/227/22 Brinklow BNEF**

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## 1 Revision Control

Rev	Issue date	Description	Prep.	App.
1	31/01/2023	Issued for comment	PK	BK
2	09/02/2024	JO reference updated	PK	BK

## 2 Executive Summary

<b>Site Name</b>	Brinklow BNEF
<b>DNO</b>	Cadent Gas Limited
<b>LDZ</b>	West Midlands
<b>Error Start Date</b>	25 <sup>th</sup> November 2022
<b>(Or) Last Good Date</b>	
<b>Error Corrected Date</b>	26 <sup>th</sup> November 2022
<b>Size of Error (over or under read)</b>	25 Sm <sup>3</sup> over-registration (368.5 KWh)
<b>Error Description</b>	Erroneous fiscal USM flow readings
<b>Methodology</b>	Comparison of inlet meter and fiscal meter flow readings
<b>Meter Type</b>	Ultrasonic meter
<b>MER Unique Reference Number</b>	WM030
<b>Cadent Internal Reference</b>	MER/CAD/227/22

### 3 Error Description

Brinklow BNEF has a single ultrasonic meter stream for measurement of gas exiting the grid entry unit (GEU) and entering the distribution network (referred to in this report as 'Fiscal USM'). A second ultrasonic meter is located on the inlet to the GEU for process control (referred to in this report as 'Inlet USM'). Propane injection is used to control the gas properties (e.g. calorific value, Wobbe number, etc.) to meet the requirements of the Gas Safety (Management) Regulations (GS(M)R). Gas that is not within specification is rejected by a diverter valve.

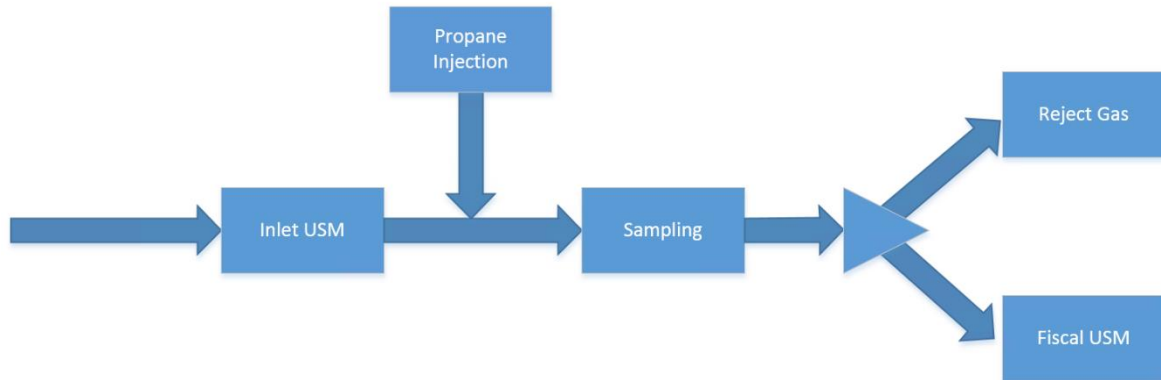


Figure 1 - Grid Entry Unit Flow Diagram

During normal operation the Fiscal USM will read higher (~40.4 Sm<sup>3</sup>/h) than the Inlet USM due to the addition of propane.

On the following date, an error was noted:

- 25/11/22

### 4 Methodology

The offset between the Inlet USM and Fiscal USM was calculated from the periods of steady flow surrounding the error period. This can be seen in the below trend. The error period was between approximately 04:49 – 06:57 on the 26th of November 2022. Therefore, the error period spanned across the gas days of the 25th and 26th. However Cadent have already applied a correction to the data for the 26<sup>th</sup> so this MER only covers the correction to be applied on the 25<sup>th</sup>.

The Fiscal USM volume flow rate was corrected by using the Inlet USM volume flow rate plus the average offset for that period when the fiscal meter should have been measuring continuously and also by setting fiscal meter flow rates equal to zero when the system was in recirculation mode and should not have been measuring.

Two sets of volume totals were calculated, one using the measured Fiscal USM flow and another using the corrected Fiscal USM flow, the error being the difference between the two. The volume flow rates for the Fiscal USM, the Inlet USM and the corrected Fiscal USM were plotted for the period between 25th November 2022 – 27th November 2022 in Figure 2.

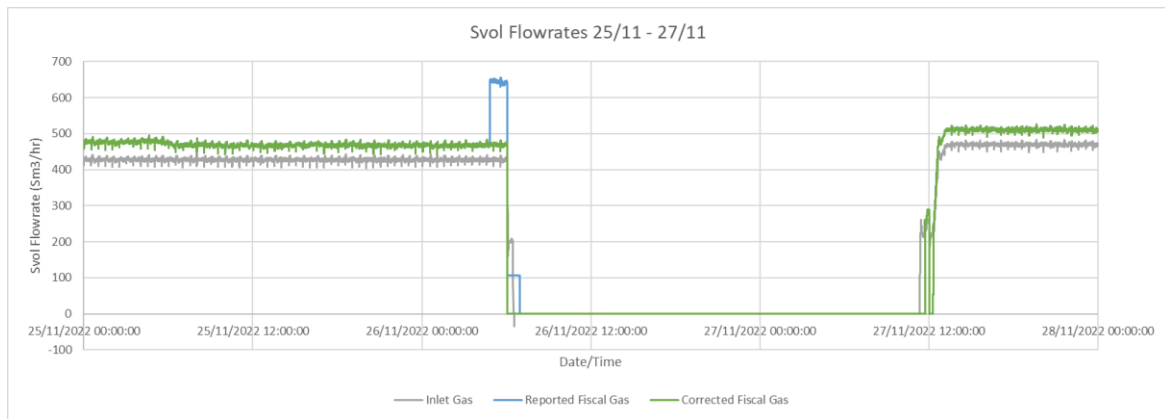


Figure 2 Volume flow rates for Fiscal USM, Inlet USM and corrected Fiscal USM (25/11/2022 – 27/11/2022)

## 5 Error Quantification

The error is estimated to be an overall over-registration of 25 Sm<sup>3</sup>. The error for the period is detailed in Table 1. The error should be corrected using the daily correction factors in Appendix A. Please refer to the summary within the accompanying document (MER\_Data) for further details on how these values were derived.

Gas Date	Total Error (Sm <sup>3</sup> )
25/11/2022	25.06
<b>Total</b>	<b>25.06</b>

Table 1 – Total error during the period of mismeasurement

## 6 Learning

It is suspected that contamination on the ultrasonic meter transducers originating from the propane injection system has caused the meter to read erroneously. Consideration should be given to continuous monitoring, recording and time/date stamping the diverter valve position in order to ascertain if the system was recirculating or flowing to the distribution network. This would result in easier analysis if mismeasurements were to occur again.

## 7 References

Gemini Daily Volumes

MER\_CAD\_227\_22\_Data\_Calculation.xlsx calculation spreadsheet

## Appendix A – Daily Correction Factors

The errors should be corrected using the Daily Correction Factors applied to the Gemini Daily Volumes as detailed below. The Daily Correction Factor is the ratio of the corrected volume to the uncorrected volume for each respective gas day.

Gas Day	Gemini Daily Volume (MSCM)	Daily Correction Factor
25-Nov-22	0.01127	0.997776