



Measurement Error Report

Stanton Energy Limited

MER_CAD_269_22 Stanton BNEF

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1 Revision Control

Rev	Issue date	Description	Prep.	App.
1	30/01/24	Issued for comment	TB	AS

2 Executive Summary

Site Name	Stanton Energy BNEF
DNO	Cadent Gas Limited
LDZ	East Midlands
Error Start Date	24 th September 2023
(Or) Last Good Date	
Error Corrected Date	
Size of Error (over or under read)	98 Sm ³ over registration (0.000798 GWh)
Error Description	Erroneous readings on Fiscal meter
Methodology	Calculation of accumulated Svol totals during periods of erroneous flowrate, and subtraction of these values from reported totals. Energy then calculated from Volume and average CV for duration of error.
Meter Type	Ultrasonic meter
MER Unique Reference Number	
Cadent Internal Reference	MER/CAD/248/23

3 Error Description

Stanton Energy BNEF has a single 2" Sick Flowsic500 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 2" Sick Flowsic500 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. During normal operation the Fiscal USM will read slightly higher than the Inlet USM due to the addition of propane.

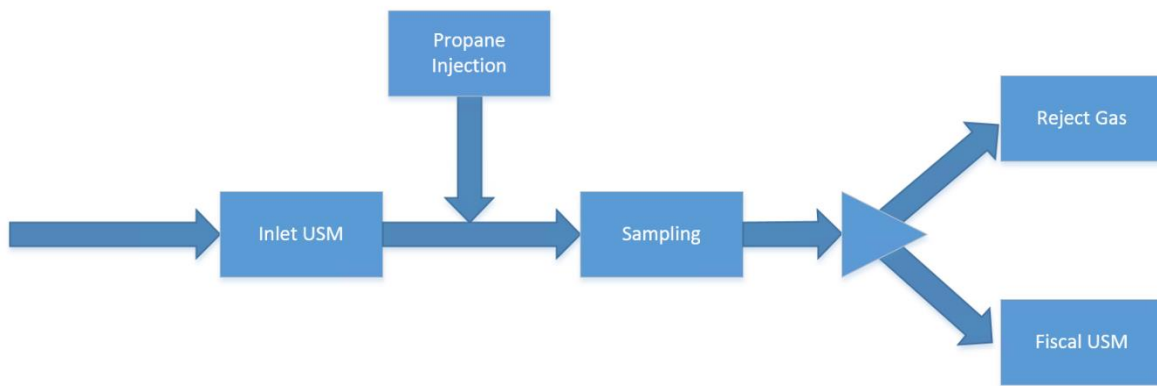


Figure 1 - Grid Entry Unit Flow Diagram

Errors were noted on the following day:

- 25/09/23 04:18 to 08:49

It is noted when comparing the calculated daily volume from this Measurement Error Report to the billed daily volumes retrieved from Cadent Energy Control Centre that a manual correction had already been completed for the days in error; gas days 24th and 25th September. This MER Report shows that the manual correction already processed for gas day 25th is accurate on Volume only. The correction for Energy for both gas days remains outside the 0.1% limit allowed in the Measurement Error Guidelines and further reconciliation is required.

4 Methodology

Over the period of interest, the flowrates on the fiscal meter dropped dramatically, from around 660 Sm³ to approx. 114 Sm³, indicating the meter system had gone into reject mode but was still recording a flow. *Note: The switch to reject mode is evident from the trends in pressure and temperature.* The error consisted of the fiscal meter reading high for a period of 271 minutes. Of this error duration the initial 42 minutes can be attributed to gas day 24th Sept 23, with the remaining 229 minutes being attributed to gas day 25th Sept 23.

The calculated error is the sum of the Fiscal Meter total standard volume flow for the affected time period. The calculated standard volume error for each gas day was then subtracted from the relevant gas day calculated daily standard volume total. The calculated energy error is then equated using the calculated standard volume error and the average CV for the error duration.

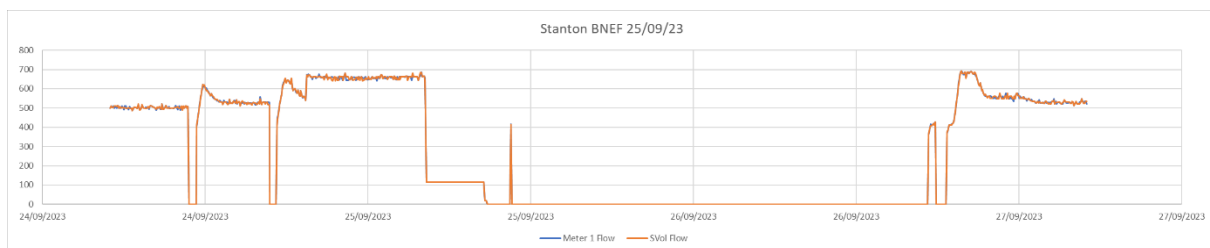


Figure 2 – Meter volume flowrate for Fiscal Meter

5 Error Quantification

The total error is estimated to be an overall over registration of 492 Sm³, (18.17 GJ). Of this, 81 Sm³ (3.037 GJ) affects gas day 24/09/23 and 411 Sm³ (15.128 GJ) affecting gas day 25/09/23. These values are calculated from the Danint meter data.

When comparing these values to the Cadent reported Gemini end-of-day values it can be seen that a manual correction has previously taken place. The daily total Svol difference between MER estimated and (corrected) reported Gemini data is -0.76% on gas day 24/09/23 and 0% for gas day 25/09/23. However, when looking at the daily total energy difference, -0.51% on 24/09/23 and -21.33% on 25/09/23, these values are outside of the 0.1% reconciliation limit. The correction factors listed in Appendix A are calculated for the estimated Energy daily totals against the reported Gemini data and should be used to correct the EOD values for both gas days.

When taking into account the previous correction the remaining total over registration is an estimated **98 Sm³ (2.64 GJ; 0.005 GWh)**. The tables below show the estimated standard volume and energy totals for each gas day.

Gas Day	Daily Volume (Sm ³)				
	Reported at Metering	Estimated	Est Error	Gemini Latest	Gemini Difference
24-Sept-23	12923	12842	81	12940	98
25-Sept-23	441	30	411	30	0

Table 1 – Standard Volume over correction values for gas day

Gas Day	Daily Energy (GJ)				
	Reported at Metering	Estimated	Est Error	Gemini Latest	Gemini Difference
24-Sept-23	518	514.96	3.04	517.6	2.64
25-sept-23	16	0.87	15.13	1.11	0.24

Table 2 – Energy over correction values for gas day

The calculated data is detailed in the accompanying document “MER_CAD_269_23 Stanton MER Calc Data”.

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. Ongoing early testing suggests this may be a result of the transportation/bunkering methods. It is recommended considering additional liquid filtration on the propane injection line and/or additional filtration on the propane tank outlet. Consideration should be given to implementing a live comparison between the non-Fiscal meters (inlet + propane) and the Fiscal meter to give early warning of any measurement error.

7 References

Gemini Daily Volumes

MER_CAD_269_23 Stanton Calc Data

Calculation spreadsheet

Appendix A – Daily Correction Factors

The error should be corrected using the Daily Correction Factors applied to the Gemini Daily Energy totals as detailed below. The Daily Correction Factor is the ratio of the estimated energy to the Latest Gemini energy for each respective gas day.

Gas Day	Latest Gemini Daily Energy (kWh)	Daily Correction Factor
24-Sept-2023	143,778	0.994905
25-Sept-2023	308	0.786727

Table 3 – Daily Energy correction factors for the periods of mismeasurement