FLUENTA

CASE STUDY

INDUSTRY: OIL & GAS **PUBLISHING DATE:** JANUARY 2017

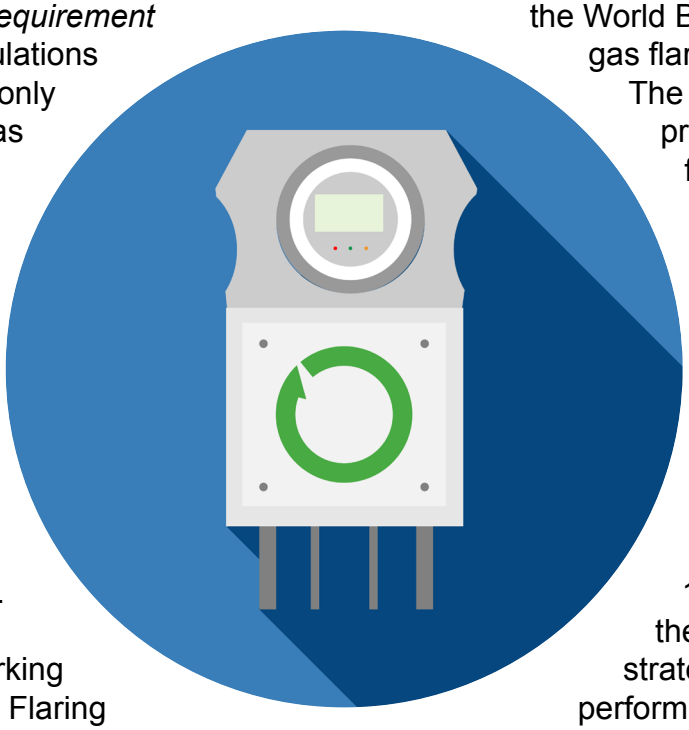
Established Accuracy

Extensive testing at VSL, the National Metrology Institute in the Netherlands, demonstrated that calibration of the Fluenta 160 flare gas meter achieves 1.5 per cent uncertainty even in low flow. This accuracy was confirmed in several tests on behalf major oil and gas companies in the Middle East and South East Asia.

Requirement

While typical regulations require 5% accuracy, only ultrasonic technology has the capability to meet stricter requirements. Testing of Fluenta's 160 flare gas meter at the VSL facility was carried out on behalf of a customer that required a higher level of accuracy for its flow meters to achieve corporate standards.

The company is working towards 'Zero Routine Flaring by 2030', an initiative introduced by the World Bank to eliminate routine gas flaring no later than 2030. The additional accuracy provided by a calibrated flow meter will enable the company to more effectively manage the transition to zero routine flaring, as well as report non-routine flaring volumes accurately.



Results

Testing of the Fluenta 160 flare gas meter at the VSL facility demonstrated the meter can perform with an uncertainty of +/- 1.5%. Significantly, the low

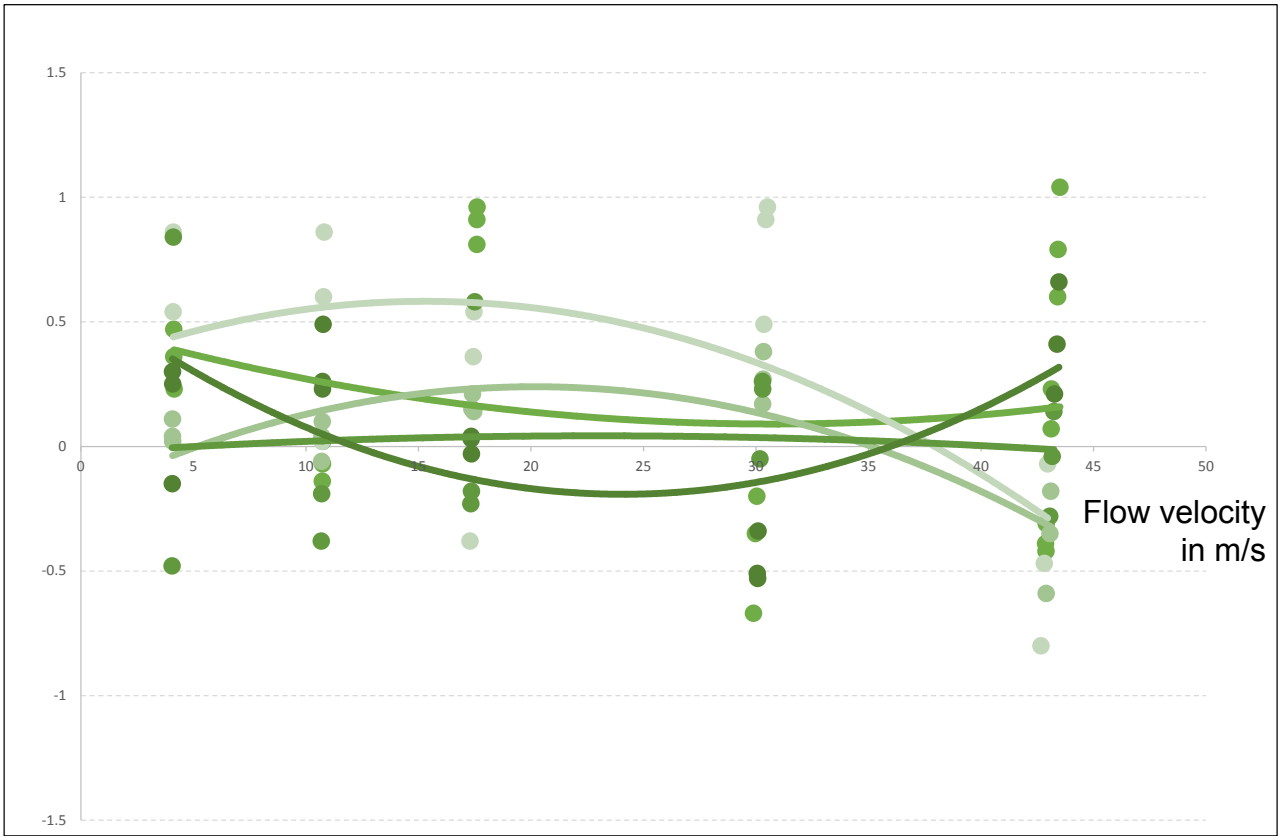
uncertainty of the 160 flare gas meter was achieved even during low flow rates, which is typically difficult due to the irregular flow profile.

The Fluenta 160 flare gas meter was calibrated using air under atmospheric conditions, with a relative humidity of 44.8% and a temperature of 20oC. The 160 was calibrated against a VSL multipath master meter for reference, where the volume of flow of the reference meter was converted to a volume flow at the conditions of the 160, taking temperature and pressure into account.

The accuracy demonstrated in the VSL testing was further confirmed in several tests on behalf major oil and gas companies in the Middle East and South East Asia.

VSL ensures the results of its calibration services are traceable to primary or internationally accepted measurement standards. The standard uncertainty of measurement for testing of the Fluenta 160 flare gas meter was determined in accordance with the 'Evaluation of measurement data – guide to the expression of uncertainty in measurement' (GUM) from the Joint Committee for Guides in Meteorology.

Graph: VSL Test Results for Fluenta 160 Flare Gas Meter



About VSL
VSL is the Netherlands' National Metrology Institute. As well as the management and development of national measurement standards, VSL provides third party testing and calibration services for flow measurement devices.

The extensive VSL facility in the Netherlands enables calibration of flow meters to exacting standards. VSL offers the lowest possible uncertainty in the field of volume, mass and flow and its process analyses the entire metering system to establish its accuracy and measurement uncertainty.

About the Fluenta 160
Fluenta's flare gas meters use ultrasonic technology to provide the most accurate and reliable readings of gas flow possible. Unlike other technologies, ultrasonic measurement is not impacted by the composition or cleanliness of the gas flow, and delivers accuracy regardless of turndown ratio or temperature ranges.

The transducers on the 160 flare gas meter are non-intrusive and have no moving parts. Maintenance and support demands are therefore minimal, and neither installation nor maintenance requires plant shutdown.

Image: VSL Certificate of Calibration for Fluenta 160

VSL
Dutch Metrology Institute

CERTIFICATE OF CALIBRATION

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Instrument

Type of meter transducers	:	Ultrasonic meter tranducers
Manufacturer	:	Fluenta
Type		FGM 160
TAG number	:	305-FT-2103
Transducer serial numbers		
Upstream	:	302-U-14
Downstream	:	302-D-14
Electronics		
Type	:	FGM160-MK2
Serial number	:	20151009
Output	:	10 - 1010 Hz
Q_{min} / Q_{max}	:	0 / 833 m³/h
K-factor	:	0.975019
Spool piece		
Serial number	:	A15043595
Diameter	:	355.6 mm

Results

Indicated flow rate (m³/h)	Reference flow rate (m³/h)	Error (%)	Uncertainty (%)
830.5	837.8	-0.87	0.23
622.2	625.3	-0.49	0.28
417.4	419.0	-0.40	0.21
210.8	210.8	0.01	0.30
126.3	125.7	0.53	0.82

The stated uncertainty is the uncertainty in the determination of the error. The uncertainty in the determination of the reference flow rate does not exceed 0.15%.

The error is determined by:

$$\text{Error} = \frac{\text{Indicated flow rate} - \text{Reference flow rate}}{\text{Reference flow rate}} \times 100\%$$