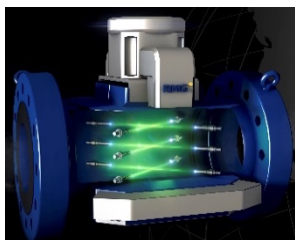


AGA Report No. 9 Now Allows Calibrating USMs with Laboratory Piping

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Introduction

Beginning with the 2007 version of AGA Report No. 9 (also known as AGA 9), flow calibration has been required for all fiscal applications when using gas ultrasonic meters (USMs). Traditionally the meter, along with the associated piping and flow conditioner (called the Metering Package in AGA 9), has been sent to the laboratory to be calibrated as a single unit. For small line sizes, the added cost of shipping all the piping components with the meter isn't significant. However, when larger line sizes are involved, the additional cost becomes very substantial. It also increases the complexity of the shipment since many of these complete assemblies are very heavy and quite long. The latest version of AGA 9, Fourth Edition, dated January 2022 [Ref 1], now specifically addresses the issue of calibrating the USM with laboratory piping, also referred to as "surrogate spools" by AGA 9, in lieu of the field piping.

AGA Report No. 9 Discussion

The AGA 9 definition of the "metering package" is as follows: *A piping package that consists of a meter and adequate upstream and downstream piping, along with thermowell(s), sample probe, and any flow conditioning to ensure that there is no significant difference between the results indicated by the meter in the laboratory and those indicated in the final installation.* Thus, during the past 15+ years, since the release of AGA 9's Second Edition, clients have been shipping their entire metering package to the calibration lab and then on the final site. AGA 9 didn't say they had to calibrate with the field piping, but many assumed it was needed to insure accurate USM performance. Most also choose to leave the entire package assembled after calibration which adds more cost since a dedicated semi is generally required for shipping.

Benefits

Using lab piping not only saves significant shipping costs to the lab and the location for installation, but it also allows for quicker customer delivery as the meter can be calibrated in advance of the piping being completed. Another benefit is cost and time savings for re-calibration of meters that have been in service. Rather than requiring the metering package to be taken out of service for several weeks, a replacement meter can be calibrated and installed in less than one day.

Data Collection Discussion

At the AGA Operations Conference in 2019 [Ref 2] a paper was presented that discussed what effect a wide range of surface finishes (4 spools between 40 to 253 μ -inch) had on the performance of three brands of 8" gas USMs (Daniel, Honeywell & SICK). Testing was performed with a 10D spool between the [Canada Pipeline Accessories](#) CPA 50E and the meter at the [TransCanada Calibrations](#) (TCC) facility in 2018. This was prior to RMG having a presence in NA. The AGA paper concluded the effects, if any, were relatively insignificant considering the wide range of roughnesses tested. RMG subsequently tested the GT400, with the same piping, in 2020 to support its performance was also not affected. [Tech Note 6](#) [Ref 3] discusses the RMG test results.

With surface roughness information now available from four different brands of USMs, the [American Gas Association's](#) (AGA) Transmission Measurement Committee (also known as the TMC) decided to update the Third Edition (2017) of AGA 9. Section 6.1 was revised to provide specific language regarding the use of surrogate spools during flow calibration.

Prior to the Fourth Edition being released in January 2022, [Pipeline Research Council International](#) (PRCI) completed testing on an additional line size to further validate this change. They funded a test for 16" meters at the TCC facility which involved two surface finishes (86 and 357 μ -inch). Information on the 16" RMG GT400 results are also part of our [Tech Note 6](#). A PRCI report was published in 2021 summarizing all meter testing.

Summary

AGA 9's Fourth Edition is making a significant contribution in lowering the installed cost for gas ultrasonic meters in many ways. Significant savings can be realized, not only in shipping, but lead times for new meter installations. Downtime for recalibrated meters is now reduced from weeks to hours as a replacement meter can be made available well in advance.

References

1. *AGA Report No. 9, Measurement of Gas by Multipath Ultrasonic Meters, Fourth Edition, January 2022*, American Gas Association, Washington, DC.
2. *Upstream Pipe Surface Roughness Effects on Gas Ultrasonic Meters (USM)*, Reese Platzer, 2019 AGA Operations Conference, Nashville, TN
3. *RMG's GT400 Upstream Piping Surface Roughness Test Results*, [Tech Note 6](#), John Lansing, January 1, 2021