TECH NOTE 5

RMG's GT400 Gas USM Regulator Performance Significantly Reduces Cost

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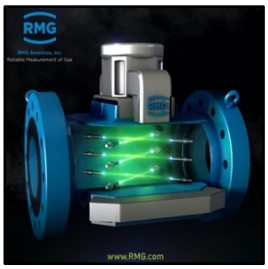
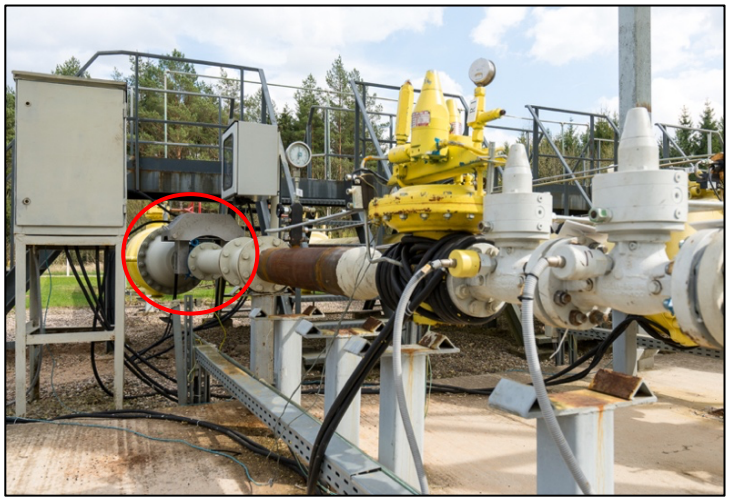


Introduction

Today's gas USM metering facilities often require using regulators in close proximity for pressure and/or flow control. It is well known that pressure regulators create significant ultrasonic noise inside the pipeline which can interfere with the meter's operation. When the regulator noise exceeds the meter's ability to differentiate the receiving signal from the extraneous noise, meter performance will decrease, and it can stop working. Traditionally many clients install a number of tees between the meter and regulator to help isolate the noise from the meter. This solution significantly increases metering facility cost in several ways. First, tees are expensive, and their cost can easily approach that of the meter body, especially in larger line sizes. Second, tees significantly increase a meter facility's footprint. For those facility designs that utilize skids, the skid cost is now much greater. Third, the addition of tees often requires a second skid for the regulators, and this substantially adds to the overall station cost. **But what if a gas USM could cope with control valve noise without the need for tees?** If this meter could also be installed with 6 nominal diameters of upstream piping (3D+CPA 55E+3D), instead of the traditional 10D+CPA 50E+10D, **the net result would be a very significant reduction in meter station cost**. This Tech Note discusses a European RMG GT400 USM installation where regulator noise is far more severe than any traditional North American pipeline application.

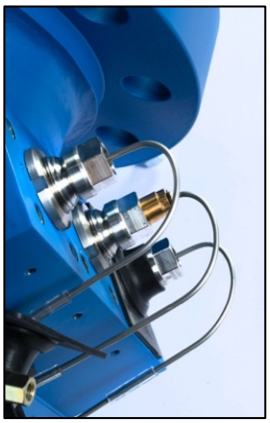
Installation Details

Traditionally most metering facilities that require regulators install them downstream of the USM. This helps reduce the noise that can interfere with the meter's operation. For one Lithuanian installation, the client wanted to install the USM at the delivery pressure of 44 PSIG (3 Bar). Upstream supply pressure is 580 PSIG (40 Bar). Due to space limitations, the meter was installed directly downstream with no tees or other noise-attenuating piping. Two flow conditioners (RMG) were installed in series upstream of the meter to stabilize the flow profile after the regulator, thus reducing meter uncertainty and increasing the meter's diagnostic benefits. The photo to the right shows the yellow RMG upstream regulator in the foreground, and the red circle indicates where the meter is located downstream under the walkway.



Performance Results

This 6" USM was installed in 2015 and has continued to operate without failure since then. The gas temperature entering the meter can approach -13°F (-25°C) in the winter due to a combination of pressure drop (Joule-Thompson effect) and flowing gas temperature. It continues to operate with 100% transducer performance on all 6 paths, and the SNR is significantly above the point where failure would occur. So, you ask, how is this possible? The answer lies in the meter's transducer and wiring design. Instead of using lower cost intrinsically safe wiring to power the transducers, RMG utilizes state-of-the-art explosion-proof "micro-tubing" (see picture to the right). This allows for much higher voltage to be delivered to the transducer. This higher voltage significantly increases the transducer's sound pressure level (SPL) and permits accurately identifying the receiving waveform in even the most demanding noise applications.



Summary

By combining the benefits of the RMG GT400's control valve noise immunity, with the close-coupled 3D+CPA 55E+3D upstream piping performance (see Tech Note 3 for details), overall measurement facility cost will be significantly reduced. **With capital expenditures being of major concern in today's market, RMG provides clients with the most cost-effective ultrasonic metering solution.**

RMG Tech Notes

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