TECH NOTE 4 📍

GT400 Ultrasonic Meter Dry Gas Test Results Before & After Wet Gas Testing





Introduction

RMG Tech Note 2 (GT400 6-Path Gas Ultrasonic Meter Wet Gas Test Results Summary) discussed the performance of an 8" GT400 gas ultrasonic meter when subjected to a variety of liquid loading scenarios. There were several objectives for this testing. First, would the meter continue operating at 100% transducer performance when subjected to 1% liquid by volume? Second, what errors would be expected at the various liquid loadings? And third, what is the meter's diagnostics signature for the various conditions? Data obtained from these CEESI Nunn wet gas tests confirmed all six pairs of transducers continued to operate with 1% liquid loading. The

meter's accuracy was summarized relative to their dry gas reference meter (in Tech Note 2), and important diagnostics information was obtained. This data supports the RMG GT400 can be used in applications where liquids may be present. However little, if any, data has been published to show if a USM's accuracy, after being subjected to liquids, remains the same. This Tech Note discusses the initial "as-found" results of an 8" RMG GT400 6-path meter, which was obtained from the TransCanada Calibration (TCC) facility in January 2020, prior to the wet gas testing, and then a second "as-found" test results after the meter was returned to TCC in August 2020.

Test Details

An 8" RMG GT400 USM was initially baseline tested at TransCanada Calibrations (TCC) in January 2020 prior to being shipped to CEESI. It was installed with a 98 micro-inch 10D spool-piece between the CPA 50E and the meter, and about 80D of straight piping upstream. The "as-found" results for six (6) flow rates was obtained, but no meter factors were applied. The gas velocity flow rates selected were as follows: 100, 70, 40, 20, 10 and 5 FPS. This provided a performance baseline result for a 20-1 rangeability meter



calibration, which is a common range for many clients. The picture above shows the meter installed at the TCC facility. The meter was then shipped to the CEESI Nunn Wet Gas Test Facility for a series of wet gas tests at both 200 and 800 PSIG. After testing was completed at CEESI (see Tech Note 2 for details and results), it was returned to TCC where it was again tested with the same upstream piping and CPA 50E flow conditioner, and at the same gas velocities. The graph below shows the results for the "as-found" prior to the CEESI wet gas testing, and after it was returned to TCC.

1.00

Test Results

The graph to the right shows results in red for the initial TCC "as-found" test that was conducted in January 2020. Once the meter was returned to TCC, the graph in black show the "as-found" results from the August 2020 test. The FWME difference, as shown in the table within the graph, was 0.02%. These results are well below the meter and facilities' combined reproducibility.

0.75 --As Found in August 2020 0.50 iation [%] 0.25 0.00 -0.25 -0.50 **FWME January** -0.10 -0.75 FWME August -0.08 -1.00 0 20 40 60 80 100 120 **Gas Velocity**

8" GT400 "As Found" Before and After Wet Gas Testing

As found in January 2020

Summary

Testing at the TCC Flow Calibration facility confirms that the RMG 8" GT400 gas

ultrasonic meter's "as-found" performance, both before and after the the Nunn Wet Gas wet gas testing, had no effect on the meter's accuracy. Thus, using the RMG GT400 in an application where liquids are present from time to time will not impact the accuracy once the liquids have passed thru the meter.

RMG Tech Notes

Tech Note 1: RMG GT400 6-Path Gas USM Performance Summary

Tech Note 2: RMG GT400 6-Path Gas Ultrasonic Meter Wet Gas Test Summary Results Tech Note 3: Shorter Upstream USM / CPA Piping Length Significantly Reduces Cost