Ultrasonic Flow Meters

This five-day course discusses many varieties of ultrasonic meters manufactured by several vendors in use on pipelines. The primary function of ultrasonic meters is to provide a non-intrusive method to measure the flow of gas in a pipe. The following types of ultrasonic flow meters are described in this course: Instromet single path meters (GasSonic 400 and Check Sonic), Instromet Multipath meters (3 & 5 path Q sonic), Daniel Multipath meters (Senior Sonic), and Daniel Multipath meters (Junior Sonic).

I. Introduction to Ultrasonic Meters

II. Terms and Definitions

III. Theory of Operation
· Transit Time Calculations
· Transit Time Example
· General Requirements for Accurate Ultrasonic Flow Measurement
· Example Path Configurations and Uses
· Path Configuration Examples
· General Physical Properties
· Wire Frame Model of Gas Flow Profiles
· Acoustic Path Length
· Electronic Outputs
· Meter Capacity Comparisons
· Dry Calibration
· Ultrasonic Meter Flow Calibration Results 8-30”
· Characteristics of Ultrasonic Flow Meters
· Meter Liabilities
· Installation Considerations or Manufacturer’s Recommendations
· Plant Applications

IV. Manufacturers of Ultrasonic Flowmeters
· Instromet Ultrasonic Flow Meters
· Daniel Multipath Ultrasonic Meter (Senior Sonic)

V. Flowmeter Applications
· Using SonicWare Software
· Test Procedures
· Station Inspection Frequencies
· Safe Retraction, Removal, and Replacement of Ultrasonic Transducers

VI. Ultrasonic Meter Monthly Maintenance Requirements
· Long-Term Maintenance
· Maintenance Procedures