



Natural Gas Measurement Standards

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Pipeline R&D Forum

March 22-24, 2005





The Purpose of Measurement Standards

- Provide a mutually-acceptable basis between a buyer and a seller (and, sometimes, a government oversight agency) for custody transfer measurement.
- Allow new measurement technologies to be accepted on a broad scale and in a timely manner.
- Also - validates the investment in an R&D program to expedite technology transfer and to provide a sound technical basis for the content of the measurement standards.





Standards Writing Entities In the U.S.

- American Gas Association (AGA)
 - Coriolis meters (also API)
 - Energy meters
 - Orifice meters (also API)
 - Turbine meters
 - Ultrasonic meters
 - Compressibility factor (also API)
 - Sound speed
 - Field meter transfer proving



Standards Writing Entities In the U.S.

(continued)

- American National Standards Institute (ANSI)
 - Rotary meters
 - Diaphragm meters
- American Petroleum Institute (API)
 - Coriolis meters (also AGA)
 - Differential pressure meters
 - Orifice meters (also AGA)
 - Collecting and handling of natural gas samples
 - Calculation of gross heating value, etc. (also GPA)
 - Compressibility factors (also AGA)
 - Electronic gas measurement



Standards Writing Entities In the U.S.

(continued)

- Gas Processors Association (GPA)
 - Obtaining natural gas samples for analysis by gas chromatography
 - Calculation of gross heating value, etc. (also API)
 - Selection, care, etc. of natural gas reference standard blends
 - Analysis for natural gas & similar gaseous mixtures by gas chromatography
 - Tentative method of extended analysis for natural gas and similar gaseous mixtures by temperature programmed gas chromatography
 - Table of physical constants of paraffin hydrocarbons and other components of natural gas





Standards Currently Under Revision

- American Gas Association
 - Energy meters
 - Turbine meters
 - Ultrasonic meters
 - Field meter transfer proving
- American Petroleum Institute
 - Differential pressure meters
 - Orifice meters (also AGA)
 - Collecting and handling of natural gas samples
- Gas Processors Association
 - Obtaining natural gas samples for analysis by gas chromatography
 - Calculation of gross heating value, etc. (also API)





Background

- Each standards writing organization has technical committees that oversee the development and maintenance of their standards.
 - The committees include technical experts and other stakeholders.
 - Committee members typically volunteer their time.
- Most existing gas measurement standards are on a 5-year review cycle.
- New standards can be developed at any time.





More Background

- The measurement standards are based upon technical information from credible sources.
 - Gas companies
 - Government labs
 - Independent labs
 - Commercial labs
 - Universities
 - Equipment manufacturers





Sources of Funding for R&D and Testing

- GRI/GTI
 - Principal source between 1987 and 2004 - but no longer.
 - Included funding for the Metering Research Facility.
- PRCI
- Standards writing bodies (i.e., AGA, API, & GPA)
- Government agencies (e.g., DOE & MMS)
- Gas companies
- Equipment manufacturers





Issues and Challenges

- The gas industry is very receptive to more cost-effective measurement technology.
- Introduction of new technology will be stifled if standards for the technology are not put in place in a timely manner.
- Standards writing committee support/activity is waning as gas companies de-emphasize involvement in industry-funded organizations.
 - Update and revision of existing standards takes longer than in the past.
 - New standards can be slow in developing.





Issues and Challenges

(continued)

- With the end of GRI/GTI R&D funding, funding for support of measurement standards development has been cut by nearly an order of magnitude in 2005.
- Future funding sources for technical support of measurement standards are uncertain.
- At least in the near term, funding sources will be few in number (e.g., PRCI and MMS) and much smaller in budget.





Issues and Challenges

(continued)

- U.S. versus international standards.
 - There is some overlap/redundancy between U.S. and international (e.g., ISO and OIML) standards.
 - Technical differences between U.S. and international standards can take significant time and money to resolve (e.g., orifice meter expansion factor correlation).
 - U.S. participation in the international standards development process is waning due to logistical and budgetary issues, so U.S. interests may not be adequately addressed in the future.





Issues and Challenges

(continued)

- U.S. versus international standards (cont.).
 - The international standards development process is experiencing many of the same problems as the U.S. process – e.g., dwindling committee participation and budgetary issues for supporting test work.
 - The international standards development process can take longer than the U.S. process due, in part, to the larger number of stakeholders.

