Natural Gas Measurement Standards

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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.
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.