IMPROVING THE INTERNATIONAL ACCEPTABILITY OF FLOW MEASUREMENTS

G. E. Mattingly*

*Chairman, CIPM/CCM/Working Group for Fluid Flow
and Deputy Chief, Process Measurements Division
National Institute of Standards and Technology Gaithersburg, MD
USA, E-mail: gmattingly@nist.gov

ABSTRACT

Rapid advances in technology–communications, the internet, tele–marketing, travel, etc. are accelerating the globalization of the world's market places. To facilitate this globalization, the Committee on International Weights and Measures (CIPM) has produced a Mutual Recognition Arrangement (MRA). This Arrangement, signed into existence in Oct 1999, has the objectives:

1. to establish the degree of equivalence of national measurement standards maintained by the National Metrology Institutes (NMIs),
2. to provide for the mutual recognition of calibration and measurement certificates issued by the NMIs, and thereby
3. to provide governments and other parties with a secure technical foundation for wider agreements regarding measurements that relate to international trade, commerce, and regulatory affairs.

Information on the CIPM, and the MRA can be found on the website: www.bipm.org

Degrees of equivalence between national measurement standards are based on the results of comparisons conducted within the Consultative Committees of the CIPM. Flow measurement efforts are being addressed by the newly formed Working Group for Fluid Flow (WGFF) of the CIPM Consultative Committee on Mass and Related Quantities (CCM). The member National Metrological Institutes (NMIs) of the WGFF are organized into specific measurement areas. In each of these areas, and according to MRA rules, the efforts are to design and conduct Key Comparison (KC) tests that quantify the equivalence of the flow standards maintained in the participating NMIs. To determine appropriate operating ranges for KC's, the WGFF is reviewing the Calibration and Measurement Capabilities (CMCs) of the participating NMIs.

This keynote presentation will briefly describe the MRA and the WGFF plans and programs to conduct the KC tests. The techniques planned for the KCs will be to design tandem flow meter transfer standards in the selected fluid and flow test conditions to quantify the performance of NMI flow standards under actual conditions of use. Youden analysis of variance techniques are planned to guide the resulting data analysis.

The results of these efforts are expected to make it feasible for flow measurements made anywhere in the world to be understood and acceptable anywhere else.