

CORIOLIS FORCE FLOWMETER DATA EVALUATION PROJECT FINAL REPORT

SCOPE OF WORK

The primary emphasis of this project is the re-evaluation of the existing data and the development of any new conclusions. As part of this analysis the existing database will be reviewed for anomalies in proving report sequences that would indicate that data had been selectively chosen. On July 2, 1998 HMC, Inc was requested by the task group chair to modify the scope of work to address the items in attachment I of E. Carlson's June 15, 1998 letter. These issues include linearity, repeatability/reproducibility; swirl and asymmetrical flow effects; proving methods; physical property effects such as pressure, temperature, viscosity and density variation (short time).

BACKGROUND

The API initiated work to develop a Coriolis Measurement Standard in 1989, the draft standard was submitted for ballot in December 1992 and again in the fall of 1993. As a result of the negative ballots both times, the document was issued in May 1995 as a Draft Committee Report and a Coriolis Task Group was formed to develop a recommendation for future efforts relating to a standard on Coriolis Force Flowmeter. The recommendation was to continue the development of a draft standard divided into two parts, mass and volume measurement. This recommendation was based on the initial analysis of more than 900 field-proving reports. This project added 70 additional data sets representing three meter manufacturers and sixteen sites to the original collection of data sets. Additionally, data continued to arrive after the deadlines.

A report summarizing the data collection and analysis efforts of the task group was prepared and presented in February 1997. Data was obtained for meters configured for both volume and mass measurement; additionally meters were proved on both a mass and volume basis. The criteria used to evaluate the data was that the range of repeatability of a proving had to be $\leq 0.05\%$; and the meter factor over time could deviate by no more than $\pm 0.25\%$ from the average meter factor for all of the proving's (reproducibility).

The results of the proving result analysis showed that for meters configured for volume; 83% met the reproducibility criteria and 91% met the repeatability criteria. Those meters configured for mass met the reproducibility criteria 90% of the time and the repeatability 81%. That report is considered to be a part of this report and the effort will be focused on addressing the issues in attachment I.