Finally, the method developed here could be applied to autoclave systems under disc rupture, and it is intended to report on some theoretical/practical comparisons shortly.

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BOOK REVIEW

Review of Mass Flow Measurements – 1984

Eds T. R. Hedrick and R. M. Reimer

The papers compiled in this document reflect the wide range of concerns of flow meter manufacturers and users alike that increasingly prevail in many industrial sectors in 1985. The current scarcity of critical fluid resources and the rising prices of valuable fluid products are generating enhanced interest in improved fluid measurements. This is true not only for the accuracy requirements in custody transfer between buyer and seller of fluid but also in the precision levels now needed to satisfactorily monitor and control fluid flow for optimal productivity in the process industries, particularly the chemical and petrochemical industries.

Mass flowrate is one of the fundamental physical variables in fluids engineering. Its measurement is an essential part of the development of many new process systems. The papers collected in this document represent a compilation of the flowmetering efforts underway today to improve fluid measurement. These papers describe:

(1) new techniques or concepts in instrumentation;
(2) experimental or test results to establish accuracy and/or precision of flow measurement techniques;
(3) new methods or analytical models used to interpret instrument response characteristics.

The papers are divided into four sections—two of these are devoted to differential pressure-type fluid metering topics, one to multiphase flow measurement, and one to electrical type fluid meters.

Of the two differential pressure sections, one deals entirely with orifice meters and reflects the increased concerns prevailing today in the large-volume custody transfer of gas using these devices. The large calibration-testing programme underway both in the USA and in Europe to improve the fundamental data base for orifice meters indicate both the widespread concern and level of interests in improving matters. Correspondingly, a number of studies have been made to understand salient features of orifice flow. Several of these involving geometrical or fluid dynamic effects are presented in the orifice metering section of this document. The remaining papers address alternative techniques such as vortex shedding, venturis, nozzles, etc.

The multiphase flow measurement section contains a number of papers dealing with various aspects of the multitude of variables and conditions that are significant in this area of fluid (and solids) measurement. Paper topics range from the assessment of techniques determining the mass flowrate of gas-liquid mixtures through the analysis of capacitive techniques for void fraction to the presentation of test results for multi-component systems for measuring mass flowrate in transient two-phase flows.

The electrical-type fluid metering section contains four papers which reflect efforts to establish new or improve existing measurements using electrical effects. The range of topical areas addressed includes droplet flux in mist flows, to thermal probe arrays for the duct flow of air, to velocity measurement via charging techniques in low conductivity fluids.

In addition to concluding that this is a broad ranging and interesting compendium of fluid measurement results, the Coordinating Group on Fluid Measurements and Fluid Meters Committee, of the Fluids Engineering Division of ASME is to be commended for producing such a worthwhile document.

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