Manual of Petroleum Measurement Standards Chapter 22.5

Testing Protocols—Flow Computational Devic

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Introduction

This document defines the testing and reporting protocols for devices used to calculate flowrates or volumes from orifice meters measuring hydrocarbon fluids. This protocol is designed to supply industry with a baseline of capabilities of these devices under defined operating conditions in this document. The objectives of this testing protocol are to:

1) Ensure that the user of any flow computation device knows the performance characteristics of the device over all applicable range as defined by tests.

2) Facilitate both the understanding and the introduction of new technologies.

3) Provide a standardized vehicle for validating manufacturers' performance specifications.

4) Provide information about relative performance characteristics of the flow computation devices under standardized testing protocol.

5) Quantify the uncertainty of these devices and define the operating and installation conditions for which the stated uncertainties apply.

To accomplish these objectives, the testing protocol defines the test limits for operating conditions of the devices, and the requirements of the facility or facilities to perform the tests. This document encompasses any device capable of calculating flowrates as measured by an orifice meter.

Testing Protocols—Flow Computational Device

1 Scope

This API *MPMS* chapter is intended to be a standardized guideline to determine and document the fidelity of implementation of the API *MPMS* calculations standards. As with all standards developed under Chapter 22.1, this standard includes a listing of parameters affecting the performance of the devices, a description of the tests required, requirements for the test facility, a data reporting format, and an uncertainty determination methodology.

The field of application for this testing protocol is limited to devices that are used in the orifice-based measurement of hydrocarbon fluids in the petroleum, energy, and petrochemical industries.

2 Normative References

There are no normative references for this document.

3 Terms, Definitions, and Symbols

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1.1
accuracy
The extent to which the results of a calculation or the readings of an instrument approach the true value.

3.1.2
calibration span
The difference between the calibrated maximum and minimum range limits

3.1.3
certified equipment
Equipment whose performance is traceable to primary standards maintained by an internationally recognized standards organization, such as the National Institute of Standards and Technology, and that has been provided with documentation (Certificate of Conformance) stating the traceability.

3.1.4
flow computation device
An arithmetic processing unit with associated memory that accepts electrically converted signals representing input variables from a measurement system and performs calculation for the purpose of providing flow rate and total quantity data.

3.1.5
calculation version identifier
An auditable (see API *MPMS* Chapter 21.1) unique identifier used to distinguish any changes to the calculation methodology of a flow computation device.

3.1.6
non-ideal testing
Typically defined by field conditions during a system start-up (FAT/SAT).

3.1.7
quantity calculation period (QCP)
The period over which the calculated total quantity is to be integrated.