Manual of Petroleum Measurement Standards Chapter 23.1

Reconciliation of Liquid Pipeline Quantities

FIRST EDITION, JUNE 2016

AMERICAN PETROLEUM INSTITUTE

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Foreword

This Standard, API *MPMS* Chapter 23.1, supersedes API *MPMS* Standard 2560, *Reconciliation of Liquid Pipeline Quantities*, 1st Edition, and API *MPMS* Standard 2560 has therefore been withdrawn.

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Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

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Introduction

In the ideal world, every drop of liquid received into a pipeline system and every drop delivered out of the system, as well as all liquid inventory within the system, would be measured and accounted for precisely, and a comparison of all receipts and all deliveries—adjusted for inventory changes—would be exactly the same. The system would never experience a loss or a gain. Unfortunately, this ideal pipeline balance seldom exists in the real world.

Most pipeline systems typically experience some degree of loss or gain over time. This represents the normal loss/gain performance for a system. From time to time, losses or gains greater than normal may occur for a variety of reasons. Excessive or unexplained loss/gain often leads to contention between participating parties, sometimes requiring monetary settlements to adjust for abnormal loss/gain. In such cases, it is necessary to be able to (1) identify abnormal loss/gain as quickly as possible, (2) determine the magnitude of abnormal loss/gain, and (3) institute corrective actions.

Sometimes losses or gains are real, and adjustments shall be made to correct shipper batches and/or inventories. Most of the time, though, there are no real physical losses or gains. The loss/gain that occurs in day-to-day operation is usually small (a fraction of a percent) and is caused by small imperfections in a number of measurements in a system.

In a sense, loss/gain is a measure of the ability to measure within a system. Loss/gain should be monitored for any given system at regular intervals to establish what is normal for that system and to identify any abnormal loss/gain so that corrective action can be taken.

Reconciliation of Liquid Pipeline Quantities

1 Scope

1.1 General

1.1.1 This publication provides methodologies for monitoring liquid pipeline loss/gain and for determining the normal loss/gain level for any given pipeline system. Troubleshooting suggestions are also presented.

1.1.2 This document does not establish industry standards for loss/gain level because each system is individual and exhibits its own loss/gain level and/or patterns under normal operating conditions.

1.1.3 The document provides operational and statistically based tools for identifying when a system has deviated from normal, the magnitude of the deviation, and guidelines for identifying the cause of deviation from normal.

1.2 Field of Application

1.2.1 The primary application of this publication is in custody transfer liquid pipeline systems in which there is provision for measuring all liquids that enter the system and exit the system, as well as liquid inventory within the system. The application is not intended for nonliquid or mixed-phase systems.

1.2.2 The applications and examples in this document are intended primarily for custody transfer pipeline systems, but the principles may be applied to any system that involves the measurement of liquids into and out of the system and possibly, inventory of liquids within the system. Such systems may include pipelines, marine terminals, marine voyages, bulk loading or storage terminals, tank farms, and rail and trucking systems.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API *Manual of Petroleum Measurement Standards* (*MPMS*) Chapter 2, *Tank Calibration*

API *Manual of Petroleum Measurement Standards* (*MPMS*) Chapter 3.1A, *Manual Gauging of Petroleum and Petroleum Products*

API *Manual of Petroleum Measurement Standards* (*MPMS*) Chapter 4.8, *Operation of Proving Systems*

API *Manual of Petroleum Measurement Standards* (*MPMS*) Chapter 11.1, *Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils*

API *Manual of Petroleum Measurement Standards* (*MPMS*) Chapter 12.3, *Volumetric Shrinkage Resulting from Blending Light Hydrocarbons with Crude Oil*

API *Manual of Petroleum Measurement Standards* (*MPMS*) Chapter 13.1, *Statistical Concepts and Procedures in Measurement Methods of Evaluating Meter Proving Data*

API *Manual of Petroleum Measurement Standards* (*MPMS*) Chapter 13.2, *Statistical Methods of Evaluating Meter Proving Data*