Manual of Petroleum Measurement Standards Chapter 18.2

Custody Transfer of Crude Oil from Lease Tanks Using Alternative Measurement Methods

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Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Washington, DC 20001, standards@api.org.

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Introduction

The API *Manual of Petroleum Measurement Standards* (*MPMS*) covers individual standards for sampling, temperature determination, gauging, and quality testing. This publication integrates these standards, by reference, into a framework that may be applied during custody transfer of crude oil from lease tanks to a tank truck without requiring direct access to the tank thief gauge hatch. Many of the individual standards have guidelines defining the frequency and tolerances for installation, verification, and calibration of the specified equipment under controlled or ideal conditions allowing for uncertainty within custody transfer requirements. However, with the conditions encountered in many of today's applications, the installation, verification, and calibration of measurement devices may have higher uncertainties due to the operational characteristics and limited access available at the lease site. In the interest of safety and environmental concerns, these higher uncertainties may still provide acceptable measurement for custody transfer of crude oil from tanks using the defined alternate methods. The alternate measurement methods discussed in this standard are intended to minimize uncertainty and bias while encouraging consistent measurement and testing practices using existing technologies within API standards that are available at the time of the development of this standard. They are not intended to interfere with business contracts, existing API standards, or the development of new technologies or to comprise the only acceptable alternate methods of custody transfer of crude oil by trucks.

Custody Transfer of Crude Oil from Lease Tanks Using Alternative Measurement Methods

1 Scope

This standard defines the minimum equipment and methods used to determine the quantity and quality of crude oil being loaded from a lease tank to a truck trailer without requiring direct access to a lease tank gauge hatch. Methods and equipment described are grouped by tank zone, trailer zone, and the transition zone between the two (see Section 5). The equipment used for measurement is dependent on the existing design of the lease equipment, the equipment used to transport the product, or a combination of the two. Some sites may require measurements from multiple zones in order to arrive at an accurate load quantity and quality.

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 *MPMS* Chapter 2, *Tank Calibration – All relevant sections*

API *MPMS* Chapter 3.1A, *Standard Practice for the Manual Gauging of Petroleum and Petroleum Products*

API *MPMS* Chapter 3.1B, *Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging*

API *MPMS* Chapter 3.6, *Measurement of Liquid Hydrocarbons by Hybrid Tank Measurement Systems*

API *MPMS* Chapter 4, *Proving Systems – All relevant sections*

API *MPMS* Chapter 5.2, *Measurement of Liquid Hydrocarbons by Displacement Meters*

API *MPMS* Chapter 5.3, *Measurement of Liquid Hydrocarbons by Turbine Meters*

API *MPMS* Chapter 5.6, *Measurement of Liquid Hydrocarbons by Coriolis Meters*

API *MPMS* Chapter 5.8, *Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters*

API *MPMS* Chapter 6.1, *Lease Automatic Custody Transfer (LACT) Systems*

API *MPMS* Chapter 7, *Temperature Determination – All relevant sections*

API *MPMS* Chapter 7.3, *Temperature Determination—Fixed Automatic Tank Temperature Systems*

API *MPMS* Chapter 8.2, *Standard Practice for Automatic Sampling of Liquid Petroleum and Petroleum Products*

API *MPMS* Chapter 9, *Density Determination – All relevant sections*

API *MPMS* Chapter 10, *Sediment and Water – All relevant sections*

API *MPMS* Chapter 12, *Calculation of Petroleum Quantities – All relevant sections*

API *MPMS* Chapter 14.3, *Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-edged Orifice Meters – All relevant parts*

API *MPMS* Chapter 16.2, *Mass Measurement of Liquid Hydrocarbons in Vertical Cylindrical Storage Tanks by Hydrostatic Tank Gauging*

API *MPMS* Chapter 21.2, *Electronic Liquid Volume Measurement Using Positive Displacement and Turbine Meters*

API *MPMS* Chapter 22.2, *Testing Protocols–Differential Pressure Flow Measurement Devices*