Manual of Petroleum Measurement Standards Chapter 6.3A

Metering Assemblies—Pipeline and Marine Loading/ Unloading Measurement Systems

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Foreword

Revision of API *MPMS* Chapter 6, *Metering Assemblies*, First Edition (2021) is ongoing. The revision supersedes all previous API *MPMS* Chapter 6 standards with the following four separate standards:

— API *MPMS* Chapter 6.1A, *Metering Assemblies—General Considerations*, First Edition (2021);

— API *MPMS* Chapter 6.2A, *Truck and Rail Loading and Unloading Measurement Systems*, First Edition (2021);

— API *MPMS* Chapter 6.3A, *Pipeline and Marine Loading/Unloading Measurement Systems*, First Edition (2021);

— API *MPMS* Chapter 6.4A, *LACT Systems*, First Edition (2021).

These standards supersede the previous API *MPMS* Chapter 6 standards as follows:

— API *MPMS* Chapter 6.1A, *Metering Assemblies—General Considerations*, First Edition (2021) specifies the common requirements for all metering systems and does not supersede any previous API *MPMS* Chapter 6 standards.

— API *MPMS* Chapter 6.2A, *Truck and Rail Loading and Unloading Measurement Systems*, First Edition (2021), supersedes API *MPMS* Chapter 6.2, *Loading Rack Metering Systems*, Third Edition (2004), which will be withdrawn on the publication of API *MPMS* Chapter 6.2A.

— API *MPMS* Chapter 6.3A, *Pipeline and Marine Loading/Unloading Measurement Systems*, First Edition (2021), supersedes API *MPMS* Chapter 6.5, *Metering Systems for Loading Marine Bulk Carriers*, Second Edition (1991), and API *MPMS* Chapter 6.6, *Pipeline Metering Systems*, Second Edition (1991), and Section 5.3.5 of Chapter 6.3A supersedes API *MPMS* Chapter 6.7, *Metering Viscous Hydrocarbons*, Second Edition (1991), all of which will be withdrawn.

— API *MPMS* Chapter 6.4A, LACT Systems, First Edition (2021), supersedes API *MPMS* Chapter 6.1, *Lease Automatic Custody Transfer (LACT) Systems*, Second Edition (1991), and Section 5.2 of Chapter 6.4A supersedes API *MPMS* Chapter 6.7, *Metering Viscous Hydrocarbons, Second Edition* (1991), all of which will be withdrawn on the publication of API *MPMS* Chapter 6.4A.

NOTE API *MPMS* Chapter 6.7 is superseded by both Chapter 6.3A and Chapter 6.4A. Therefore, API *MPMS* Chapter 6.7 will be withdrawn when both Chapter 6.3A and Chapter 6.4A are published.

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The verbal forms used to express the provisions in this document are as follows.

Shall: As used in a standard, “shall” denotes a minimum requirement to conform to the standard.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required to conform to the standard.

May: As used in a standard, “may” denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, “can” denotes a statement of possibility or capability.

This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the

content of this publication or comments and questions concerning the procedures under which this publication was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the director.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually by API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001, standards@api.org.

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Introduction

This standard serves as a guide in the selection, installation, and operation of pipeline and marine loading and unloading, floating production, storage, and offloading (FPSO), and floating storage and offloading (FSO) metering systems. This standard does not endorse or advocate the preferential use of any specific type of metering system or meter.

In general, metering system installations have to meet certain fundamental requirements, including those that ensure proper meter type, size, installation, and adequate protective and readout devices. Descriptions of metering system components are included either in this standard or other API *MPMS* chapters.

Sections of Chapter 6 describe metering system design. Chapter 6.1A describes the general considerations applicable to all metering systems and shall be consulted together with this standard (Chapter 6.3A) when designing pipeline and marine loading and unloading meter systems. When aspects are covered under the scope of other chapters of the API *Manual of Petroleum Measurement Standards*, and to avoid replication and conflict, they are not covered by this standard. In these cases, this standard provides limited information and refers the user to those chapters.

Work sites and equipment operations may differ. Users are solely responsible for assessing their specific equipment and premises in determining the appropriateness of applying the *MPMS*. At all times, users should employ sound business, scientific, engineering, and judgment safety when using the *MPMS*.

The following scenarios are merely examples for illustration purposes only. (Each company should develop its own approach.) They are not to be considered exclusive or exhaustive in nature. API makes no warranties, express or implied, for reliance on or any omissions from the information contained in this document.

Metering Assemblies—Pipeline and Marine Loading/Unloading Measurement Systems

1 Scope

This standard is part of a set of documents that detail the minimum requirements for metering systems in single phase liquid applications. This standard (Chapter 6.3A) details the specific requirements for the design, selection, and operation of pipeline, marine loading and unloading, FPSO, and FSO metering systems.

LACT measurement, multiphase fluids, asphalts, wellhead, and subsea measurements are not covered by this standard.

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 6.1A, *General Considerations*

3 Terms, Definitions, and Symbols

3.1 Terms and Definitions

For the purposes of this document, the following terms and definitions apply. Terms of more general use may be found in the API *MPMS* Chapter 1 Online Terms and Definitions Database.

3.1.1
floating production, storage, and offloading vessel
FPSO
A floating vessel designed to produce and process hydrocarbons from subsea sources or the collection of produced oil from nearby platforms; store oil; and transfer the hydrocarbons to other vessels or pipelines for transport.

3.1.2
floating storage and offloading vessel
FSO
A floating vessel designed to store produced hydrocarbons from nearby platforms or FPSOs, and transfer the hydrocarbons to other vessels or pipelines for transport.

3.1.3
marine loading metering system
A metering system designed to measure hydrocarbons transferred from a shore terminal or refinery, or from vessel to vessel.

3.1.4
marine metering system
A metering system designed to measure hydrocarbons from vessel to vessel, offshore platform to vessel, vessel to shore facility, and shore facility to vessel for loading or unloading hydrocarbons.

3.1.5
marine unloading metering system
A metering system designed to measure hydrocarbons transferred from a vessel to a shore terminal, refinery, or vessel.