

# **Manual of Petroleum Measurement Standards Chapter 3—Tank Gauging**

## **Section 4—Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging**

FIRST EDITION, APRIL 1995

REAFFIRMED, MAY 2016



AMERICAN PETROLEUM INSTITUTE

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## FOREWORD

This publication covers standard practice for level measurement of liquid hydrocarbons on marine vessels by automatic tank gauging, and supersedes all applicable sections of API Standard 2545, *Method of Gaging Petroleum and Petroleum Products* (October 1965).

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Suggested revisions are invited and should be submitted to the Measurement Coordinator, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005.

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## Chapter 3—Tank Gauging

### SECTION 4—STANDARD PRACTICE FOR LEVEL MEASUREMENT OF LIQUID HYDROCARBONS ON MARINE VESSELS BY AUTOMATIC TANK GAUGING

#### 1 Scope

This standard provides guidance on the selection, installation, calibration, and verification of automatic tank gauges (ATGs) for measuring the level of liquid hydrocarbons having a Reid vapor pressure less than 15 pounds per square inch absolute (103 kPa), transported aboard marine vessels (tankers and barges).

Marine ATGs are not normally used in custody transfers because of the limitations described in Appendix A. However, level measurement by marine ATGs may be used in custody transfer when no other alternative measurement is available. The use of marine vessel-based ATGs for custody transfer normally requires mutual contractual agreement between the buyer and the seller and may be subject to government regulations.

This standard also provides guidance on the requirements for data collection, transmission, and receiving. The Appendix B briefly describes the operation of the most commonly used marine ATG equipment.

This standard is not applicable to the following subjects:

- Conversion of tank level to liquid volume.
- Measurement of free water or sediment lying under the liquid hydrocarbon.
- Measurement of temperature, density, or sediment and water (S&W). These measurements are discussed in Chapters 7, 9, and 10 of the *API Manual of Petroleum Measurement Standards (MPMS)*.
- Sampling for determination of the properties of the liquid hydrocarbon. This is discussed in API Chapter 8.
- Detection of tank leaks.

Safety and material compatibility precautions shall be taken when using marine ATG equipment. The manufacturer's recommendations on the use and installation of the ATG equipment should be followed. Users shall comply with all applicable national and international codes and regulations.

#### 2 References

##### 2.1 STANDARDS

Unless otherwise specified, the most recent editions or revisions of the following standards shall, to the extent specified herein, form a part of this standard.

API

- Manual of Petroleum Measurement Standards*
  - Chapter 1, "Vocabulary"
  - Chapter 2, "Tank Calibration"

- Chapter 2.8B, "Recommended Practice for the establishment of the Location of the Reference Gauge Point and the Gauge Height of Tanks on Marine Tank Vessels" (*in press*)
- Chapter 3, "Tank Gauging"
- Chapter 3.1A, "Standard Practice for Manual Gauging of Petroleum and Petroleum Products in Stationary Tanks"
- Chapter 7, "Temperature Determination"
- Chapter 8, "Sampling"
- Chapter 9, "Density Determination"
- Chapter 10, "Sediment and Water"
- Chapter 17, "Marine Measurement"
- Chapter 17.2, "Measurement of Cargoes on Board Tank Vessels"

##### 2.2 OTHER REFERENCES

DOT<sup>1</sup>

33 *Code of Federal Regulations* Part 153.

46 *Code of Federal Regulations* Part 39.20

*Guide for Electrical Installations on Merchant Vessels and Mobile Offshore Drilling Units*

IMO<sup>2</sup>

*International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code)*

Chapter 13.1, *Gauging*

OCIMF<sup>3</sup>

*International Safety Guide for Oil Tankers and Terminals*

#### 3 General

This section is applicable to all types of marine ATGs. Safety precautions are listed separately from general precautions that affect accuracy or performance.

##### 3.1 SAFETY PRECAUTIONS

The following safety codes and regulations shall be followed:

- International Maritime Organization (IMO)—*International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code)* and IMO Chapter 13.1, *Gauging*.

<sup>1</sup>The *Code of Federal Regulations* is available from the U.S. Government Printing Office, Washington, D.C. 20402.

<sup>2</sup>International Maritime Organization, London, England.

<sup>3</sup>Oil Companies International Marine Forum, Portland House, Stag Place, London SW1E 5BH, England.