

# **Manual of Petroleum Measurement Standards Chapter 2.2A**

## **Measurement and Calibration of Upright Cylindrical Tanks by the Manual Tank Strapping Method**

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# Measurement and Calibration of Upright Cylindrical Tanks by the Manual Tank Strapping Method

## 1 Scope

**1.1** This standard describes the procedures for calibrating upright cylindrical tanks used primarily for the storage of petroleum liquids. It first addresses procedures for making necessary measurements to determine total and incremental tank volumes and then presents the recommended procedures for computing volumes.

**1.2** Both SI (metric) and U.S. customary (USC) units are presented where appropriate in the document. SI and USC conversions may not necessarily be exact. The SI units often reflect what is available in commercial equipment.

**1.3** The standard also provides guidelines for recalibration and for computerization of calculations.

## 2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any addenda) applies.

API *Manual of Petroleum Measurement Standards (MPMS) Chapter 2B, Calibration of Upright Cylindrical Tanks Using the Optical Reference Line Method*

API Standard 650, *Welded Steel Tanks for Oil Storage*

API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction*

API Standard 2555, *Method for Liquid Calibration of Tanks*

ICS <sup>1</sup>/OCIMF <sup>2</sup>/IAPH <sup>3</sup>, *International Safety Guide for Oil Tankers and Terminals (ISGOTT)* <sup>4</sup>

IP <sup>5</sup> *Petroleum Measurement Manual* Part 1, "Tank Calibration," Section 1, "Vertical Cylindrical Tanks, Measurement Methods"

NFPA 306 <sup>6</sup>, *Standard for the Control of Gas Hazards on Vessels*

## 3 Safety

**3.1** Before entering any tank, permission shall be obtained from the terminal supervisor, authorized official, or other responsible person in charge. This responsible person should supply information regarding particular materials and conditions or the applicable Material Safety Data Sheet (MSDS).

**3.2** Due consideration should be given to applicable safety procedures. Safety considerations include, but are not limited to, potential electrostatic hazards, potential personnel exposure (and associated protective

<sup>1</sup> International Chamber of Shipping, 38 St Mary Axe Street, London EC3A 8BH, United Kingdom, [www.ics-shipping.org](http://www.ics-shipping.org).

<sup>2</sup> Oil Companies International Marine Forum, 27 Queen Anne's Gate, London, SW1H 9BU, United Kingdom, [www.ocimf.com](http://www.ocimf.com).

<sup>3</sup> International Association of Ports and Harbors, 7th Floor, South Tower New Pier Takeshiba 1-16-1 Kaigan, Minato-ku, Tokyo 105-0022, [www.iaphworldports.org](http://www.iaphworldports.org).

<sup>4</sup> *ISGOTT* is available from Witherby Publishing Group Ltd. (Marine Publishing), 32/36 Aylesbury Street, London EC1R 0ET, United Kingdom.

<sup>5</sup> Institute of Petroleum, 61 New Cavendish Street, London W1M 7AR, United Kingdom, [www.energyinst.org.uk](http://www.energyinst.org.uk).

<sup>6</sup> National Fire Protection Association, 1 Batterymarch Park, Quincy, Massachusetts 02169-7471, [www.nfpa.org](http://www.nfpa.org).