Hydrocarbon management

HM 9

Guidelines for selection and installation of meters on road/rail petroleum loading gantries

2nd edition

energy institute

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GUIDELINES FOR SELECTION AND INSTALLATION OF METERS ON ROAD/RAIL PETROLEUM LOADING GANTRIES

2nd edition

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CONTENTS

Page

Contents continued

Page

LIST OF FIGURES AND TABLES

Page

Figures

Tables

FOREWORD

The Energy Institute's (EI's) Hydrocarbon Management Committee (HMC) is responsible for the production and maintenance of standards and guides covering various aspects of static and dynamic measurement of petroleum.

The HMC is made up of the chairs and vice-chairs of the hydrocarbon management subcommittees, comprising international experts in the fields of cargo inspection, marine transportation, refineries, marketing and distribution and upstream hydrocarbon management.

The EI maintains liaison with parallel working groups of the American Petroleum Institute's (API's) Committee on Petroleum Measurement and other organisations concerned with quantitative measurement in other countries and other industries.

The EI Hydrocarbon Management Guidelines are widely used by the petroleum industry and have received recognition in many countries by consumers and the authorities. To promote their wide adoption internationally, selected standards are submitted via the British Standards Institution (BSI) to the International Organization for Standardization's (ISO's) technical committee TC 28 *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, as potential international standards.

A full list of Hydrocarbon Management Guidelines is available on request from the EI, or can be found on the EI website, https://publishing.energyinst.org.

The EI Hydrocarbon Management Guidelines are recommended for general adoption but should be read and interpreted in conjunction with safety, environmental, weights and measures, customs and excise and other regulations in force in the particular country in which they are to be applied. Such regulatory requirements have precedence over corresponding clauses in the EI document except where the requirements of the latter are more rigorous when its use is recommended. Users should also consider contractual constraints imposed by any other interested party.

Users are invited to send comments, suggestions, or details of relevant experience to:
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1 INTRODUCTION AND SCOPE

1.1 INTRODUCTION

This document is one of a series of guidance documents on the measurement of liquid hydrocarbons provided by the EI. The guidance reflects best industry measurement practice and includes performance expectations. As this is given as guidance, local conditions, regulation, contract conditions may take precedence.

Gantry loading systems ('loading rack systems' in the US) are installed to allow the filling of road and rail tankers from bulk storage. The 'gantries' are installed to take product from a manifold and transfer it safely to the receiving tanker. The gantry metering system measures the quantity of product loaded into the tanker and provides the measurement used as both fiscal and custody transfer values for each transaction in addition to providing a cumulative measurement for supply chain mass balance. Gantry loading systems may provide 'top' or 'bottom' fill arrangements for the receiving tankers; however, due to environmental concerns, 'bottom' fill systems are more common.

The gantry measurement system consists of a flowmeter, secondary instrumentation (temperature and pressure measurement), and the mechanical or electronic registers, computers or recording systems providing the final measurement of traded quantity. The measurement system also includes all related pipework, fittings and valves which may influence the measurement. In terminals with multiple users, the system may also include additive packages for the specific user.

This document replaces former EI documents *HM 9. Meters. Section 3: Guidance notes for the installation of turbine meters on loading gantries* and *HM 41. The performance of turbine meters in loading gantries – A review of proving and test data,* which only covered the installation of turbine flowmeters in gantry measurement systems.

1.2 SCOPE

This document provides guidance on the specification, design, and installation of measurement systems installed in road and rail loading gantries, operating on unheated white oil products, but the principles can be applied to the design of loading gantries for other products with the application of different performance criteria. The document excludes heated oils, heavier hydrocarbon products, liquefied petroleum gas (LPG) (both pressurised and chilled) and cryogenic products such as liquefied natural gas (LNG).

This document covers the gantry measurement system only; it does not cover the design of a complete loading system or the specific requirements for safe operation, particularly in respect of electrical and static electricity or the prevention of spillage.

This document covers selection and installation of positive displacement (PD) meters, turbine meters and Coriolis meters, but the principles may be applied to other meter types. UK gantry measurement system designs should comply, where applicable, with Her Majesty's Revenue and Customs (HMRC) *Excise notice 179: Motor and heating fuels – General information and accounting for Excise Duty and VAT* and with its associated Code of Practice *HM 39. A guide to recommended measurement practice for compliance with the requirements of HMRC Notice 179.*

An explanation of some of the technical terms within this document can be found in Annex C; however, a more comprehensive library of technical terminology can be found in *HM 0. Hydrocarbon Management terms and definitions.*