

THE INSTITUTE OF PETROLEUM  
PETROLEUM MEASUREMENT MANUAL  
GUIDELINES FOR THE DEVELOPMENT OF  
UNCERTAINTY ESTIMATES FOR  
PIPE PROVER CALIBRATIONS

Petroleum Measurement Paper No. 12



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PIPE PROVER CALIBRATIONS

Petroleum Measurement Paper No. 12

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# FOREWORD

The Petroleum Measurement Committee of the Institute of Petroleum is responsible for the production and maintenance of standards and guides covering the various aspects of static and dynamic measurement of petroleum. These are issued as separate Parts and Sections of the Institute's *Petroleum Measurement Manual*, which was first published in 1952.

Membership of the IP working panels is made up of experts from the oil industry, equipment manufacturers, cargo inspectors and government authorities. Liaison is maintained with parallel working groups of the Committee on Petroleum Measurement of the American Petroleum Institute, and is extended as necessary to embrace other organizations concerned with quantitative measurement in other countries and in other industries.

Users are invited to send comments, suggestions, or details of experience with this issue to:

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The *Petroleum Measurement Manual* is widely used by the petroleum industry and has received recognition in many countries by consumers and the authorities. In order to promote their wide adoption internationally, it is the policy to submit selected standards through the British Standards Institute to Technical Committee TC 28 - Petroleum Products and Lubricants - of the International Organization for Standardization (ISO/TC 28) as potential International Standards.

A full list of the Parts and Sections of the *Petroleum Measurement Manual* (PMM) is available on request from the Institute of Petroleum.

Note:

The IP *Petroleum Measurement Manual* is recommended for general adoption but shall be read and interpreted in conjunction with weights and measures, safety and other regulations in force in the location where it is to be applied. Such regulatory requirements shall have precedence over the corresponding clauses in the Manual except where the requirements of the Manual are more rigorous, when its use is recommended. The Institute disclaims responsibility for any personal injury, or loss or damage to property howsoever caused, arising from the use or abuse of any Part or Section of the Manual.

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# SCOPE

This document is a basic guide to the principles of traceability and uncertainty of prover calibration, suitable for operators in the field. It is designed to augment the procedures and experience of the established calibration companies and to add the estimation of uncertainty to the established certificates in a metrologically sound manner.

Guidance is provided for each of the calibration methods in common use in the oil industry. This is to

augment the existing standards. Block diagrams are used to demonstrate suggested traceability for each method. The diagrams are greatly simplified and provide guidance to the expected traceability put in place from the calibration company carrying out the operation. The guidance for method, traceability and uncertainty outlines what both operator, calibration company and regulator should expect from prover calibration operations.