



*Training Course:  
Flow Measurement and Custody Transfer*

*18 - 22 May 2025*

*Cairo (Egypt)*

*Holiday Inn & Suites Cairo Maadi, an IHG Hotel*

## Training Course: Flow Measurement and Custody Transfer

Training Course code: EN6094 From: 18 - 22 May 2025 Venue: Cairo (Egypt) - Holiday Inn & Suites Cairo Maadi, an IHG Hotel Training Course Fees: 3900 € Euro

### Introduction

Custody Transfer defines the point at which ownership changes hands for the process product being measured. This transfer is unique among flow-meter applications since money changes hands and accuracy requirements are higher than they are for most other applications. The custody transfer system must generate detailed and indisputable cargo reports, based on accurate flow measurements and calculations.

In this intensive and highly practical training course, participants will gain sound and practical understanding and extend their knowledge of Custody Transfer and Flow Measurement systems, principles and types, and how to assess their impact on the strategic and tactical aspirations of the company.

### This training course will highlight:

- The laws governing fluids and gases
- Important principles of flow-metering including accuracy and repeatability
- Main types and applications of Flowmeters with emphasis on custody transfer
- Flowmeter proving and calibration techniques
- Custody transfer principles and applications

### Course Objectives of Flow Measurement and Custody Transfer

This training course introduces participants to a variety of flow measurement technologies and systems that are used custody transfer applications, and gain an understanding about how measurement systems can work properly and accurately.

### At the end of the training course, the participants will:

- Have a sound understanding of relevant fluid and gas Laws that are needed for the use of flow measurement devices
- Understand the main requirements of custody transfer systems
- Appreciate the main requirements of flow measurements including accuracy and repeatability
- Be knowledgeable about up-to-date flow measurement meters including differential pressure DP measurement, turbine meters, positive displacement meters, Coriolis flow measurement, Magnetic, and ultrasonic flow measurement.
- Gain the ability to determine if a metering system is adequate for the purpose, select appropriate custody transfer metering systems and identify potential problems
- Learn about the principles and applications of Multiple meters/meter runs, Flow computers, Quality systems, Calibration, Meter Runs, Proving and Supporting Automation

### Who should Attend?

This PetroKnowledge course is highly relevant to personnel needing a basic understanding of Custody Transfer concepts and requirements and fluid flow measurement techniques and applications.

This training course is suitable for a wide range of professionals but will greatly benefit:

- Engineers and Technicians of all disciplines
- Instrumentation Personnel
- Procurement and quality control personnel
- Inspection and Maintenance engineers

## Course Outlines of Flow Measurement and Custody Transfer

### Day One: Introduction - Basic Fluid and Gas Laws

**Competency Description:** Participants need to gain a sound knowledge of fluid and gas laws that are essential for the understanding of Flowmeter principles and operation.

#### Key behaviors

- Comprehensive knowledge of governing principles of fluid mechanics
- Understanding of relevant elements of gas principles and laws
- Appreciation of the importance of flow profiles in relation to flow measurements

#### Topics to be covered

- Custody Transfer principles and requirements
- Pressure, Viscosity, Flow Volume, Continuity Principle, Energy Law Bernoulli's
- Flow Configurations Flow Profiles, Laminar Flow, Turbulent Flow
- Reynold's Number, Flow Losses Friction Losses
- Ideal and Real Gases, Gas Laws, Boyle's Law, Charles's Law, Gay-Lussac's Law

### Day Two: General Characteristics and Performance of Flow Meters

**Competency Description:** Understanding the fundamental concepts related to flow measurement including Accuracy, Precision, and Rangeability, etc.

#### Key behaviors

- Gaining insight into key principles of flow measurements
- Understanding the essential requirements for related to successful flow measurements
- Consolidation of knowledge through definitions and worked examples of flowmeter parameters
- Gaining knowledge of additional and relevant measurements related to flowmeters

#### Topics to be covered

- System Characteristics and Flow range
- Performance, Accuracy, Stability and Repeatability, Sensitivity, Noise, Linearity, Reliability
- Flow modification and meter runs
- Applications and Usage, Sizing
- Temperature and Pressure Measurements

### Day Three: Types and Applications of Flow Meters

**Competency Description:** The description and comprehensive understanding of the main types of flowmeters that

are typically found in a variety of industries.

#### Key behaviours

- Understanding of key principles of specific types of flowmeters
- Further understanding of flowmeter parameters through practical examples
- Knowledge of the factors that influence these types of flowmeters
- Appreciation of relevant and specific applications, advantages and disadvantages of flowmeter types

#### Topics to be covered

- Differential Pressure DP Flow Meters, Orifice, Venturi, Nozzles, Pitot tubes
- Positive Displacement PD Flow Meters, Rotor, Oscillating Piston, Oval Gear
- Turbine Flow Meters, Conventional and Helical
- Problems with Erosion, corrosion, Cavitation and Obstructions
- Uses and Applications, Installation requirements and Standards

### Day Four: Types and Applications of Flow Meters Continued

**Competency Description:** Continued from day 3. The description and comprehensive understanding of the main types of flowmeters that are typically found in a variety of industries.

#### Key behaviors

- Understanding of key principles of specific types of flowmeters
- Further understanding of flowmeter parameters through practical examples
- Knowledge of the factors that influence these types of flowmeters
- Appreciation of relevant and specific applications, advantages and disadvantages of flowmeter types

#### Topics to be covered

- Ultrasonic Flow Meters
- Magnetic Flow Meters
- Coriolis Flow Meters
- Uses and Applications, Installation requirements and Standards
- Straight run requirement

### Day Five: Flow Measurement Systems and Custody Transfer Considerations

**Competency Description:** Consolidation of custody transfer concepts and a comprehensive understanding of the main methods of flowmeter proofing.

#### Key behaviors

- Knowledge of the key principles of custody transfer
- Understanding of the main methods of flowmeter proofing
- Knowledge of additional parameters required for proofing through practical examples

#### Topics to be covered

- Custody Transfer Requirements
- Meter Factor



- Proving Systems; Direct, Indirect, Master Meter, Volume, Displacement
- Custody Transfer Skids
- Flow Computers and Communication
- Temperature and Pressure Measurements

## Registration form on the Training Course: Flow Measurement and Custody Transfer

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Complete & Mail or fax to Global Horizon Training Center (GHTC) at the address given below

### Delegate Information

Full Name (Mr / Ms / Dr / Eng): .....  
 Position: .....  
 Telephone / Mobile: .....  
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 Official E-Mail: .....

### Company Information

Company Name: .....  
 Address: .....  
 City / Country: .....

### Person Responsible for Training and Development

Full Name (Mr / Ms / Dr / Eng): .....  
 Position: .....  
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### Payment Method

- Please find enclosed a cheque made payable to Global Horizon
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