

# Auto Custody Transfer & Measurement



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## Introduction:

**Any losses in Custody Transfer Measurements** are very large and non-recoverable. It must be understood that at this point of the business; mistakes of any kind with processes in place are very critical and extremely costly. Only through arbitration and lengthy legal claims can the losses be redeemed and only partial of that.

Proper practices, insurance of accuracy in operation and precise instrumentation measurement up front before losses can occur is of paramount importance. Errors in flow measurements subject petroleum companies to significant financial losses.

The type of work required to properly conduct and maintain accurate custody transfer flow measurements is restrictive and very specialized. Controlling losses up front is much easier than reclaiming losses incurred due to improper measurement. Few organizations within the oil industries and outside engineering firms can understand and comply with such work.


This course provides an overview of all the major activities performed by the Custody Measurement. It is never an easy task to describe the working functions of any group of specialists contributing on a daily basis to maintain and enhance effectively the key area of the company's business, the accurate measurement and control of its products to the customer. The course will endeavor to provide specialist support, introduce sophisticated state of the art monitoring and measurement systems, develop/recommend proper procedures and design standards in line with international bodies to ensure mistakes and/or losses of any kind are alleviated and/or minimized.

After completion of the course, the candidates will become better aware and more familiar with the functions and field tasks of crude and hydrocarbon fluids custody flow measurements and loss control; as well as enhance the overall awareness of the company's professional and engineering work force in this field.

**This course** is developed for engineers and technicians who need to have a practical knowledge of selection, installation and commissioning of fiscal metering equipment. It is for those primarily involved in achieving effective results in industrial processes. This would involve the design, specification and implementation of control and measurement equipment. The course focuses on practical applications, with special attention to installation considerations and application limitations when selecting or installing different measurement or control instruments for fiscal metering.

## Objectives:

**By the end of this BTS training course, participants will be able to:**

- Build a solid foundation on flow measurement and custody transfer fundamentals, issues and practical implications
  - Acknowledge all flow measurement standards for better flow measurement practices
  - Learn and become familiar with international hydrocarbon flow measurement standards and their incorporation into major petroleum companies' operational procedures and standards
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- Enhance knowledge on Fluid Dynamics and Flow Measurement Devices, their advantages and limitations
  - Consider different methods, limitations and accuracy factors in improving accuracy and tools to trouble shoot accuracy errors
  - Update on the latest flow measurement technologies to reduce losses in crude and product due to measurement errors
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- Apply best practices for System Integrity and Loss/Gain Control
  - Identify different types of Gas and Liquid Meter Provers, their applications and operations
  - Observe the different ways and methods custody measurement organizations interfaces with other major petroleum companies and departments to conduct business domestically and internationally
  - Capitalize an opportunity to learn from expertise on how to tackle current problems encountered in flow measurement and loss control

## Who should attend?

MGC Coordinators and Supervisors, Instrumentation & Metering Engineers & Technicians, Metering Managers and Engineers, Production Operation & Process Engineers, Instrument Workshop Supervisors, Production Technologists, Design & Mechanical Engineers, Service Staff and Inspectors of Custody Transfer Stations, Design & Process Engineers, Reservoir Engineering & Custody Technicians, Well Testing Group & Chemical Engineers, Valve Technicians & Maintenance Personnel & Supervisors

## Course Outline:

### Introduction to Fundamentals of Measurement & Basic Fluid Flow

- Definitions and Standards
  - Properties and Flow Theory
  - Gas and Liquid Measurement
  - Current Meter Technology and Applications
  - Sampling, Flow Computers and Control Systems
  - Measurement Uncertainty
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- Fluid property
  - Density
  - Viscosity
  - Surface tension
  - Modulus elasticity
  - Compressible & Incompressible flow
  - Fluid Flow
  - Continuity Equation
  - Bernoulli Equation
  - Pipe fluid flow
  - Fluid Flow Measurement


### **Performance Characteristic of Flow meter**

- Accuracy
- Repeatability
- Performance Measure
- Calculation

### **Custody Transfer Applications**

- Differential Pressure (DP) Flowmeters
- Turbine Flowmeters
- Positive Displacement Flowmeters
- Coriolis Flowmeters
- Ultrasonic Flowmeters

### **Head Flow Meter**

- Orifice
  - Sizing
  - Secondary Instrument
  - Calculation
  - Standard AGA3
  - Turbine Meter
  - Systems
  - Properties
  - Characteristics
  - Standard AGA7
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### **Oil Transfer Meter**

- Meter Run
- Proving Skid
- Meter Proving
- Meter Factor
- Base Prover
- Proving Run
- Prover Pass
- Prover Round Trip
- Proving Counter

### **Ultrasonic Flow meter**

- Ultrasonic Flow meter
- Types
- Application
- Standard AGA9

### **Shipping Calculate Volume & Calculate Correction**

- Temperature material
- Pressure material
- Oil Temperature
- Oil Pressure
- Sediments and water
- Calculate Meter Factor



### **Retroactive Meter Factor**

- Manual retroactive factor

### **Calculation Sample**

- Flow calculation
- Oil Quantity measurement
- Use Measurement Systems in MIGAS Activities