



IE065: High Accuracy Oil & Gas Flow Measurement and Process Control



Training Description:

Accurate flow measurement is essential to today's oil & gas operations. Our fiscal metering and process control training aims to provide training to facility operators, technicians and engineers where once delivered, **"keep on working."** Participants are encouraged to raise queries both during and at any time after attending the course. Participants are also encouraged to bring with them any issues that they may have to the course. High quality multi-media is used to supplement traditional methods throughout the presentation, **(based on our interactive training software)** which has proven to be more useful in explaining and understanding the topic than actually seeing a system in operation.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Understand the legal and commercial metering requirements
- ✓ Appreciate design criteria and importance of accuracy
- ✓ Understand measurement concepts and types of error
- ✓ Understand the basic concepts, principle of operation and equipment used for gas metering, liquid metering, proving and sampling
- ✓ Understand the basic concepts, principle of operation and hardware used for typical flow computers, prover control micro-computers and supervisory systems
- ✓ Understand the typical operations, control functions and record keeping requirements
- ✓ Evaluate the results of turbine meter calibration and determine the validity by use of control chart

Training Designed for:

This course is intended for everyone whose concerned with the operation, maintenance and readings from oil & gas flow metering systems and process control. This includes Operations Engineers, Instrumentation Engineers, Design Engineers, Maintenance Engineers, Section Heads, Supervisors, Team Leaders, Operators, and Metering Specialist/Technicians.

Training Program:

DAY ONE:

- ❖ Pre-Test
- ❖ Introduction
 - Typical gas development overview
 - Typical gas pipeline system
 - Role of operator
 - Overview of typical gas sales
 - Contracts
- ❖ Typical Gas Metering System Overview
 - Introduction to fiscal metering
 - Dynamic measurement accuracy
 - Pipework and valving



- Flow measurement
- Instrumentation
- Orifice plates
- Gas turbine meters
- Ultrasonic meters
- Vortex meters
- ❖ **Primary Flow Measurement Instrumentation**
 - The orifice plate
 - Meter tubes and orifice fittings
 - Details
 - Orifice plate
 - Removals/replacement procedure
- ❖ **Flow Measurement Instrumentation**
 - Flow measurement uncertainty
 - Rangeability and calibration
 - Dual range & smart DP
 - Transmitter
- ❖ **Secondary Measurement Instruments**
 - Pressure measurement - general
 - Temperature measurement - general
 - Density measurement - general

DAY TWO:

- ❖ **Gas Quality Measurement**
 - The gas sampling and conditioning system
 - Relative density analyzer
 - Moisture analyzer
- ❖ **Gas Chromatographs**
 - Introduction to gas chromatography
 - Gas conditioning system
 - Gas chromatograph
 - Chromatograph controller
 - Calibration and maintenance
- ❖ **Computer System Overview**
 - System functional description
 - User access security
 - System operation
- ❖ **Stream Flow Computers Hardware**
 - Software overview
 - Display formats
 - Alarm handling and interpretations
 - Flow computer calculations
 - Response to input failures

- Calibration mode (maintenance mode)
- ❖ **Supervisory Computer System**
 - Hardware and software
 - Operator interface
 - System security
 - Communications
 - Calculations
- ❖ **Metering Panel Auxiliary Equipment**
 - Analogue to digital conversion
 - Power supplies
 - System operation

DAY THREE:

- ❖ **Documentation, Record Keeping and Reporting**
 - Production logs
 - Reporting formats
 - Rules for logbook entries
- ❖ **Calibration and Maintenance**
 - Test equipment
 - Types of standards
 - Orifice plate
 - Differential pressure transmitters
 - Static pressure transmitters
 - Temperature measurement loops
 - Gas densitometers
 - Relative density analyzers
 - Moisture analyzers
- ❖ **High Accuracy Oil & Gas Flow Measurement**
 - Typical oil development overview
 - Typical oil pipeline system
 - Role of operator
 - Overview of pipeline
 - Transportation agreement
- ❖ **Typical Oil Metering Overview**
 - Introduction to fiscal metering
 - Dynamic measurement accuracy
 - Pipework and valving
 - Prover loop
 - Flow measurement instrumentation
- ❖ **Design Criteria and Regulations**
 - Authorities: Hierarchy of importance
 - DTI gas and oil measurement branch
 - British, American and International Standards

❖ **Primary Flow Measurement Device**

- The turbine meter
- Meter tubes and valving details

DAY FOUR:

❖ **Prover Loop and Associated Components**

- Pipe provers
- Pipe spheres
- Prover components
- Prover calibration
- Prover operation

❖ **Secondary Measurement Instruments**

- Pressure management
- Temperature measurement
- Density measurement

❖ **Oil Quality Measurement**

- The oil sampling and densitometer fast loop
- Water-in-oil monitor

❖ **Sampling and Analysis**

- Continuous on-line automatic samples
- Sample receivers
- Pipeline conditions
- Sample analysis

❖ **Supervisory Computer System**

- Hardware and software
- Operator interface
- Systems security
- Communications
- Calculators

❖ **Computer Systems Overview**

- User access security
- System operation

❖ **Stream Flow Computers**

- Hardware
- Software overview
- Display formats
- Alarm handling and interpretations
- Flow computer calculations
- Response to input failures
- Calibration mode (maintenance mode)

❖ **Prover Control Microcomputer**

- Functions
- Response to input failures
- Calculations



- ❖ **Metering Panel Auxiliary Equipment**
 - Analogue to digital conversion power supplies
 - System operation

DAY FIVE:

- ❖ **Documentation – Record Keeping**
 - Production logs
 - Reporting formats
 - Rules for logbook entries
- ❖ **Calibration and Maintenance**
 - Test equipment
 - Types of standards
 - Turbine meters
 - Static pressure transmitter
 - Temperature measurement loops
 - Liquid densitometers
 - Water in oil analyzer
- ❖ **Course Conclusion**
- ❖ **Post-Test and Evaluation**

Training Requirements:

“Hands-on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant’s manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.



Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:

Aisha Relative: aisha@cmc-me.com

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615

Training & Career Development Department

