TRAINING COURSE ON PIPELINE TRANSPORT MEASUREMENT OF HYDROCARBONS

General Objective

To verify the metrological reliability of the transport of petroleum derivatives by pipeline systems according to API Standards.



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Length:

12 days





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Address:

C. Omega 201, Industrial Delta, 37545 León, Gto.



Personal benefits

By the end of this course, attendees will be able to:



•Carry out preventive and corrective maintenance to the components of a measuring system.

•Address any issues that may affect the correct performance of the measurement system.

•Provide maintenance to the measurement system according to the operating conditions and current regulations.

Schedule:

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The course will be held partially online. The theoretical courses will be held during the first week of the course. Practical courses will be held during the second week of the course.

Week 1						Week 2	Week 2					
Mon	Tue	Wed	Thu	Fri	Sat	Mon	Tue	Wed	Thu	Fri	Sat	
TC	тс	тс	тс	TC	TC	PC	PC	PC	PC	PC	PC	

TC Theoretical Course: Will analyze the theory of all modules (1-3). PC Practical Courses: Will revisit the framework proposed during the Theoretical Course and will provide examples (with physical equipments and on METPHY platform).

The Practical courses will be held on the METPHY platform in the state of Querétaro, México.

THEMATIC STRUCTURE OF THE DIPLOMA

INTRODUCTION TO FLUID MEASURING CONCEPTS

1. Fluid measurement (hydrocarbons)

1.1 Metrological terms regarding flow measurement.1.2Properties, physical quantities and flow measurement characteristics.

2.Dynamic measurement

1.1 Physical quantities that affect flow measurement.
1.2 Flow meters
1.3 Measurement uncertainty
1.4 Corrected volume calculation
1.5 Calibration systems
Calibration, verification and control chart

3.Static measurement

- 1.1 Storage tank classification
- 1.2 Level measurement
- 1.3 Volume determination (Net, corrected)
- 1.4 Volumetric calibration
- 1.5 Static measurement's uncertainty

Comparing statc and dynamic flow measurement

INSTRUMENTATION, CONTROL, AND TELEMETRY

MODULE

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MODULE

1. Sensors and transmitters

1.1 Measurement system's elements (Transductors, transmitter, connections, primary, secondary, tertiary elements...)

2.Technical documentation

2.1 P&ID (Piping & Instrumentation Diagram).2.2 Instrument data sheets

3.Information transmission

3.1 Signal types3.2 Transmission medium3.3 Communication protocols3.4Signal verification

4.Telemetry systems

4.1 Telemetry system operation

5. Trend analysis

5.1 Trend graphs 5.2Trend interpretation

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INTEGRATION OF A MEASUREMENT SYSTEM

1. Flow computer description and architecture

1.1 Flow computer hardware characteristics2.1 Flow computer software characteristics

2. Flow computer configuration

2.1 Characteristics and components of the measuring system according to a flow computer (metering station, meter, product, instruments, calibration systems, flow control valves)
2.2 Hardware and firmware selection
2.3 Characteristics and component configuration of the flow computer.

3. Security

3.1 Access levels3.2 Physical safety/security locks3.3 Information backupComputer redundancy

4. Connections

5. Report generation

- 5.1 Auiting reports
- 5.2 Configuration reports
- 5.3 Calibration reports
- 5.4 Batch reports
- 5.5 Instant reports
- Daily reports

6. Metrological regulatory compliance verification 6.1Telemetry information monitoring

7. Maintenance

8.1 Preventive maintenance 8.2 Corrective maintenance

8. Validation of the measurement system operation