

## Liquid Petroleum Measurement, cont.

### Gauging, Testing, and Running of Lease Tanks

1.3 CEUs

Please note: *This course has also been designed for on-site training, with the exception of the field exercises, and can be completed in one day.*

**Length:** 1½ days

GOALS OF THE MEASUREMENT PROCESS

LEASE TANKAGE COMPONENTS

GENERAL INSPECTION

SAFETY

MANUAL SAMPLING

DENSITY

TEMPERATURE DETERMINATION

BOTTOM SEDIMENT AND WATER DETERMINATION

LEVEL DETERMINATION

SUSPENDED SEDIMENT AND WATER DETERMINATION

PREPARATION FOR SHIPMENT

CLOSING GAUGE

CLOSURE

#### Recommended For

Operators, technicians, and supervisors and those who witness or audit lease tanks

#### Enrollment Information

Your company is invited to participate in these training programs. For additional information, contact—

Houston Training Center

The University of Texas

2700 W. W. Thorne Blvd.

Houston, TX 77073

Tel: 800-687-7052

or 281-443-7144

FAX: 281-443-8722

Email: [petexhtc@www.utexas.edu](mailto:petexhtc@www.utexas.edu)



*For more info about PETEX, check out our Web site at [www.utexas.edu/CE/petex](http://www.utexas.edu/CE/petex)*



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## PETEX Liquid Petroleum Measurement Courses

- Basic Petroleum Measurement
- Advanced Petroleum Measurement
- Gauging, Testing, and Running of Lease Tanks



[www.utexas.edu/CE/petex](http://www.utexas.edu/CE/petex)

## Basic Petroleum Measurement

3.3 CEUs

Length: 4½ Days

### PROPERTIES OF PETROLEUM

- Chemical composition of hydrocarbons
- Testing procedures for hydrocarbons
- Significance of petroleum testing
- Classroom exercise

### STATIC MEASUREMENT

- Basic tank calibration
- Calculation tables
- Gauging equipment and methods
- Static measurement calculations
- Practical exercises
  - Demonstration of a tank calibration
  - Tank gauging field exercise

### DYNAMIC MEASUREMENT

- Criteria for metering
- Displacement meters
- Turbine meters
- Coriolis meters
- Ultrasonic meters
- Accessory equipment
- Meter provers (overview)
- LACT/ACT units (overview)

### QUALITY DETERMINATION

- Definitions
- Representative sampling
  - Manual sampling
  - Dynamic sampling
- Manual sampling devices/components
- Types of dynamic sampling systems
  - In-line sampling systems
  - Fast-loop sampling systems

### CALCULATIONS OF QUANTITIES

- Definitions
- Physical properties
- Dynamic measurement calculations
  - Meter factor calculation
  - Meter ticket calculation
- Practical exercises
  - Classroom calculation exercises
  - Proving a meter with a pipe prover-field exercise
  - Discuss master meter proving
  - Demonstration of a water draw (walkthrough)

### OIL LOSS ANALYSIS

- Metering accuracy
- Tank gauging accuracy
- Other factors affecting accuracy
- Sources of measurement losses and gains

## Basic Petroleum Measurement, cont.

### Recommended For

Personnel who are new to liquid measurement and those who witness or audit measurement techniques. The *API Manual of Petroleum Measurement Standards* and the *ASTM Analytical Standards* are used.

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## Advanced Petroleum Measurement

3.3 CEUs

Length: 4½ Days

### TANK CALIBRATION METHODS

- Tank strapping
- Liquid calibration
- Optical methods
- Other calibration methods

### TANK MEASUREMENT METHODS

- Manual gauging
- Automatic tank gauging
  - Float systems
  - Radar systems
  - Servo systems
- Hydrostatic systems
- Sources of gauging errors
- Installation applications

### ELECTRONICS

- Electronic theory
- Equipment and instrumentation
- Fidelity and security
- Data transmission
- Pulse interpolation

### METERING SYSTEMS AND PROVERS

- Meter selection and sizing
- Prover selection and sizing
- Meter system layout
- Meter prover theory
- Volumetric tank provers
- Conventional pipe provers
- Small volume provers

### AUTOMATIC SAMPLING

- Theory and operation (overview)
- Various types of design (overview)
- Component performance tests
- Sampling system performance tests
- Operational performance

### OTHER METERS AND THEIR APPLICATIONS

- Differential pressure types of meters
- Types of magnetic meters

## Advanced Petroleum Measurement, cont.

- Ultrasonic/Doppler types of meters
- Meters for mass measurement
- Insertion and clamp-on types of meters
- Other meters

### METER AND PROVING TROUBLESHOOTING

- Problems with meter provers
- Problems encountered proving meters
- Turbine meter problems
- Displacement meter problems

### CALCULATIONS OF QUANTITIES

- API MPMS Chapter 12.1
- API MPMS Chapter 12.2
- Master meter calculations
- Computer implementation and calculations
- Electronic data handling and transfer
- Calculation exercises uncertainties

### PROVER CALIBRATION METHODS

- Water draw theory
- Master meter method
- Errors and uncertainties
- Water draw calculations

### PROVER CALIBRATION METHODS

#### PRACTICAL EXERCISES

- Water draw procedures
- Conventional provers
- Small volume provers
- Water draw calculations
- Exercises and problem solving

### MASS MEASUREMENT

- Mass metering methods
- Direct mass measurement
- Indirect mass measurement
- Comparison of volumetric vs mass measurement
- Mass measurement calculation

### OVERALL MEASUREMENT UNCERTAINTY

- Calculation of statistical uncertainties
- Sources of measurement uncertainties
- Methods of improving uncertainties

### Recommended For

This course is recommended for liquid measurement personnel with several years' experience or those who have completed *Basic Petroleum Measurement*.

*Need on-site training?*

*These courses can be customized to meet your company's needs.*

*Please call 1-281-443-7144 for more information.*