MODULE OVERVIEW
This module introduces trainees to quality control and field measurement. Trainees will learn how to test product, identify and verify the accuracy of meters, and monitor odorant level.

PREREQUISITES
Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following:

- Core Curriculum; Pipeline Core, Module 66101-02; Gas Pipeline Operations, Modules 67102-02, 67103-02, and 67104-02 or 67105-02

OBJECTIVES
Upon completion of this module, the trainee will be able to:

1. Take product samples.
2. Perform product testing.
3. Identify types of meters.
4. Define measurement and understand how and why gas is measured and how to interpret measurements.
5. Verify the accuracy of meters and test gauges.
6. Explain the reasons for injecting and monitoring odorant.

PERFORMANCE TASKS
Under the supervision of the instructor, the trainee should be able to:

1. Take samples.
2. Use tube testing kits.
3. Inspect orifice meter plates.
4. Identify types of meters.
SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment. Emphasize the importance of following all safety precautions and procedures when working with power tools.

PREPARATION

Before teaching this module, you should review the Module Outline, Objectives, Performance Tasks, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

<table>
<thead>
<tr>
<th>Transparencies</th>
<th>Gas chromatograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markers/chalk</td>
<td>Sampling and testing equipment</td>
</tr>
<tr>
<td>Blank acetate sheets</td>
<td>Product to test (or access to it)</td>
</tr>
<tr>
<td>Transparency pens</td>
<td>Orifice meters and equipment required for inspection</td>
</tr>
<tr>
<td>Pencils and scratch paper</td>
<td>Equipment required for meter inspection and transmitter calibration</td>
</tr>
<tr>
<td>Module Examinations*</td>
<td>Copies of sample daily measurement statements</td>
</tr>
<tr>
<td>Performance Profile Sheets*</td>
<td>Copies of 49 CFR Part 192</td>
</tr>
<tr>
<td>Overhead projector and screen</td>
<td>Sample material safety data sheets</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td></td>
</tr>
<tr>
<td>Appropriate personal protective equipment</td>
<td></td>
</tr>
<tr>
<td>Copies of your company policy and procedures manual</td>
<td></td>
</tr>
</tbody>
</table>

* Performance Sheets for this module are available from NCCER’s Instructor Resource Center at www.nccerirc.com.
For information and updates about accessing the Module Examinations, visit www.nccer.org/testing.
MODULE OVERVIEW
This module teaches the process of tracking line inventory, identifying interface changes, and tracking pigs.

PREREQUISITES
Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following:

- Core Curriculum; Pipeline Core, Modules 66101-02 and 66102-02; Liquid Pipeline Field Operations, Modules 60102-02 and 60103-02

OBJECTIVES
Upon completion of this module, the trainee will be able to:

1. Track line inventory to ensure product quality.
2. Identify interface changes to isolate batches.
3. Track pigs to clean or inspect the pipeline.

PERFORMANCE TASKS
Under the supervision of the instructor, the trainee should be able to:

1. Track line inventory to ensure product quality.
2. Identify interface changes to isolate batches.
3. Track pigs to clean or inspect the pipeline.

SAFETY CONSIDERATIONS
Ensure that the trainees are equipped with appropriate personal protective equipment. Emphasize the importance of following all safety precautions and procedures when working with power tools.
PREPARATION

Before teaching this module, you should review the Module Outline, Objectives, Performance Tasks, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

Transparencies
Markers/chalk
Blank acetate sheets
Transparency pens
Pencils and scratch paper
Module Examinations*
Performance Profile Sheets*
Overhead projector and screen

Whiteboard/chalkboard
Appropriate personal protective equipment
Copies of your company’s policy and procedures manual
Sample pig-launching report form (one copy per trainee)
Sample pig-unloading report forms (several different forms, if possible)

* Performance Sheets for this module are available from NCCER’s Instructor Resource Center at www.nccerirc.com.
For information and updates about accessing the Module Examinations, visit www.ncer.org/testing.
MODULE OVERVIEW
This module reviews techniques for maintaining field quality. Trainees will learn how to perform product testing, pipeline switching, and blending operations.

PREREQUISITES
Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following:

   Core Curriculum; Pipeline Core, Modules 66101-02 and 66102-02; Liquid Pipeline Field Operations, Modules 60102-02 through 60106-02

OBJECTIVES
Upon completion of this module, the trainee will be able to:

1. Activate tank mixing devices.
2. Take product samples.
3. Perform product testing.
4. Perform pipeline switching.
5. Perform blending operations.
6. Explain the use of and inject appropriate additives.

PERFORMANCE TASKS
Under the supervision of the instructor, the trainee should be able to:

1. Activate tank mixing devices.
2. Take product samples.
3. Perform product testing.
4. Perform pipeline switching.
5. Perform blending operations.
6. Explain the use of and inject appropriate additives.
**SAFETY CONSIDERATIONS**

Ensure that the trainees are equipped with appropriate personal protective equipment. Emphasize the importance of following all safety precautions and procedures when working with power tools.

**PREPARATION**

Before teaching this module, you should review the Module Outline, Objectives, Performance Tasks, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

**MATERIALS AND EQUIPMENT LIST**

<table>
<thead>
<tr>
<th>Transparencies</th>
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<td>Markers/chalk</td>
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<tr>
<td>Blank acetate sheets</td>
<td>Copies of your company’s policy and procedures manual</td>
</tr>
<tr>
<td>Transparency pens</td>
<td>Assorted centrifuge tubes, including tubes used in the grind out and tubes that have not yet been tested</td>
</tr>
<tr>
<td>Pencils and scratch paper</td>
<td>Draeger tube test unit with a selection of tubes</td>
</tr>
<tr>
<td>Copies of Quick Quiz*</td>
<td>Fuel samples and strips of copper to conduct a corrosion test</td>
</tr>
<tr>
<td>Module Examinations**</td>
<td></td>
</tr>
<tr>
<td>Performance Profile Sheets**</td>
<td></td>
</tr>
<tr>
<td>Overhead projector and screen</td>
<td></td>
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</tbody>
</table>

* Located in the Annotated Instructor’s Guide for this module.
** Performance Sheets for this module are available from NCCER’s Instructor Resource Center at www.nccerirc.com.
For information and updates about accessing the Module Examinations, visit www.nccer.org/testing.
MODULE OVERVIEW

This module reviews measurement components, the types of meters, and the types of provers. Trainees will learn how to maintain accurate measurements, verify meter accuracy, and perform waterdraws.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following:

Core Curriculum; Pipeline Core, Modules 66101-02 and 66102-02; Liquid Pipeline Field Operations, Modules 60102-02 through 60107-02

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Identify types of meters.
2. Explain how to maintain accurate measurement on all custody receipts and deliveries.
3. Explain how to verify meter accuracy.
4. Explain the need and frequency of performing waterdraws on provers.
5. Use tank strappings.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to:

1. Identify types of meters.
2. Maintain accurate measurement on all custody receipts and deliveries.
3. Verify meter accuracy.
4. Explain when and how to flush turbine meters.
5. Explain the need and frequency of waterdraws using provers.
SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment. Emphasize the importance of following all safety precautions and procedures when working with power tools.

PREPARATION

Before teaching this module, you should review the Module Outline, Objectives, Performance Tasks, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

<table>
<thead>
<tr>
<th>Materials and Equipment</th>
<th>Details</th>
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<tbody>
<tr>
<td>Transparencies</td>
<td>A variety of orifice plates, including:</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Concentric orifice plates</td>
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<td>Blank acetate sheets</td>
<td>Eccentric orifice plates</td>
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<tr>
<td>Transparency pens</td>
<td>Segmental orifice plates</td>
</tr>
<tr>
<td>Pencils and scratch paper</td>
<td>Copies of the API Manual of Petroleum Measurement Chapter 12, Section 2, Part 4</td>
</tr>
<tr>
<td>Module Examinations*</td>
<td>Copies of API Chapter 2 and API Standards 2550 and 2551</td>
</tr>
<tr>
<td>Performance Profile Sheets*</td>
<td>Some of the tools and equipment that may be used for general strapping procedures, including:</td>
</tr>
<tr>
<td>Overhead projector and screen</td>
<td>Reels, handles, clamps, and ropes</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Jointed poles and ladders</td>
</tr>
<tr>
<td>Appropriate personal protective equipment</td>
<td>Gauges, straightedges, and calipers</td>
</tr>
<tr>
<td>Copies of your company’s policy and procedures manual</td>
<td>Rules, shovels, levels, awls, scribes, and brushes</td>
</tr>
<tr>
<td>Sample custody tickets</td>
<td>Copies of API standards for strapping tanks and preparing documentation</td>
</tr>
<tr>
<td>Sample proving schedules for a variety of meters</td>
<td></td>
</tr>
<tr>
<td>Small volume pipe prover</td>
<td></td>
</tr>
</tbody>
</table>

* Performance Sheets for this module are available from NCCER’s Instructor Resource Center at www.nccerirc.com.

For information and updates about accessing the Module Examinations, visit www.nccer.org/testing.
MODULE OVERVIEW

This module addresses the equipment and methods necessary for ensuring accurate measurement in a liquid pipeline. The module also reviews quality control throughout all operations of the pipeline.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following:

Core Curriculum; Pipeline Core, Module 66101-02; Liquid Pipeline Control Center Operations, Modules 65102-02 through 65106-02

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Activate tank mixing devices.
2. Perform product testing.
3. Perform pipeline grade changes and tank capacity operations.
4. Explain the use of and inject appropriate additives.
5. Identify types of meters.
6. Maintain accurate measurement on all custody receipts.
7. Explain the meter proving process.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to:

1. Activate tank mixing devices.
2. Perform product testing.
3. Perform pipeline grade changes and tank capacity operations.
4. Inject appropriate additives.
5. Identify types of meters.
6. Maintain accurate measurement on custody receipts and deliveries.
7. Verify meter accuracy.
SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment. Emphasize the importance of following all safety precautions and procedures when working with power tools.

PREPARATION

Before teaching this module, you should review the Module Outline, Objectives, Performance Tasks, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

| Transparencies                             | Overhead projector and screen          |
| Markers/chalk                              | Whiteboard/chalkboard                  |
| Blank acetate sheets                       | Appropriate personal protective equipment |
| Transparency pens                          | Copies of your company’s policy and procedure book |
| Pencils and scratch paper                  | Assorted Draeger tube unit and tubes  |
| Module Examinations*                       | Sample custody tickets                 |
| Performance Profile Sheets*                |                                          |

* Performance Sheets for this module are available from NCCER’s Instructor Resource Center at www.nccerirc.com. For information and updates about accessing the Module Examinations, visit www.nccer.org/testing.
MODULE OVERVIEW

This module provides a comprehensive overview of the Supervisory Control and Data Acquisition (SCADA) system. Trainees will learn about the components of the SCADA system as well as how to troubleshoot system problems.

PREREQUISITES

Please refer to the Course Map in the Trainee Module. Prior to training with this module, it is recommended that the trainee shall have successfully completed the following:

Core Curriculum; Pipeline Core, Modules 66101-02 and 66102-02; Pipeline Electrical and Instrumentation Levels One and Two; Pipeline Electrical and Instrumentation Level Three, Modules 64301-02 through 64306-02

OBJECTIVES

Upon completion of this module, the trainee will be able to:

1. Explain the functions and importance of control systems in pipeline operations.
2. Explain the various methods of communication used on the pipeline system.
3. Explain the functions and components of the Supervisory Control and Data Acquisition (SCADA) system.
4. Explain the functions and components of programmable logic controller (PLC) systems.
5. Explain the functions and methods for redundant systems.
6. Explain troubleshooting methods for pipeline control systems.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to:

1. Draw a block diagram of a SCADA system.
2. Given a set of circumstances, react to a communications failure.
3. Identify the four major hardware components of a PLC.
4. Troubleshoot a SCADA system using the 7-step procedure.
SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment. Emphasize the importance of following all safety precautions and procedures when working with power tools.

PREPARATION

Before teaching this module, you should review the Module Outline, Objectives, Performance Tasks, and the Materials and Equipment List. Be sure to allow ample time to prepare your own training or lesson plan and gather all required equipment and materials.

MATERIALS AND EQUIPMENT LIST

<table>
<thead>
<tr>
<th>Transparencies</th>
<th>Copies of your company’s policy and procedures manual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markers/chalk</td>
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<td>Whiteboard/chalkboard</td>
</tr>
<tr>
<td>Transparency pens</td>
<td>Appropriate personal protective equipment</td>
</tr>
<tr>
<td>Pencils and scratch paper</td>
<td>Copies of your local code</td>
</tr>
<tr>
<td>Module Examinations*</td>
<td>A variety of SCADA screenshots</td>
</tr>
<tr>
<td>Performance Profile Sheets*</td>
<td>Documentation of an actual or hypothetical troubleshooting procedure</td>
</tr>
<tr>
<td>Copies of Quick Quiz**</td>
<td></td>
</tr>
</tbody>
</table>

* Located in the Annotated Instructor’s Guide for this module.
** Performance Sheets for this module are available from NCCER’s Instructor Resource Center at www.nccerirc.com.
For information and updates about accessing the Module Examinations, visit www.nccer.org/testing.