



**NCCER**

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## **LIQUID PIPELINE FIELD OPERATIONS**

### **Competencies / Objectives**

#### **MODULE 66101-02 – INTRODUCTION TO THE PIPELINE INDUSTRY**

1. Explain the basic functions and purposes of pipelines and facilities and identify the characteristics and hazards of common pipeline products.
2. Identify maps and drawings used to depict pipelines and facilities.
3. Explain the roles of control personnel and equipment in the overall operation of a pipeline.
4. Explain liquid pipeline hydraulics and gas pipeline pneumatics.
5. Explain the types and purposes of pipeline equipment.
6. Explain pipeline electrical power systems and corrosion control.
7. Review operations, maintenance, and emergency procedures and perform documentation required for pipeline operations.

#### **MODULE 66102-02 – LIQUID PIPELINE GENERAL ABNORMAL OPERATING CONDITIONS**

1. Recognize and react to abnormal facility conditions.
2. Recognize and react to activation of a safety device.
3. Recognize and react to communications failures.
4. Recognize and react to power interruptions.
5. Respond appropriately to fire, explosions, and natural disasters.
6. Recognize and react to pipeline system damage.
7. Recognize and react to unexpected hazardous liquid or carbon dioxide (CO<sub>2</sub>) leaks.
8. Recognize and react to unexplained pressure deviations.

#### **MODULE 60102-02 – BASIC PIPELINE HYDRAULICS AND EQUIPMENT**

1. Explain basic hydraulic systems.
2. Describe hydraulics as applied to pipeline operations.
3. Identify and explain basic types of hydraulic pumps and valves.
4. Describe the operation of pumps used in pipelines.
5. Identify and explain basic types of valves used in pipelines.

#### **MODULE 60103-02 – PIPELINE COMMUNICATIONS**

1. Identify and explain the internal communications requirements for operating the pipeline and the pipeline facility.
2. Explain the communications responsibilities of the pipeline facility scheduling department.
3. Identify and explain the external communications procedures that must be followed to inform and educate the general public on pipeline issues.

## **MODULE 60104-02 – PRODUCT BATCH AND PIG TRACKING**

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

## **MODULE 60105-02 – ROUTINE FIELD AND FACILITY OPERATIONS (CT 43.1, 43.2, & 43.4)**

1. Visually check facility as required.
2. Perform tank management procedures.
3. Operate valves manually or by remote control (CT 43.4).
4. Operate facility pumping equipment.
5. Set alarm parameters.
6. Perform normal facility startup and shutdown procedures (CT 43.1 and 43.2).
7. Correctly perform batch switches.
8. Calculate facility over/short.
9. Complete required operations documentation.

## **MODULE 60106-02 – MONITORING PIPELINE OPERATIONS (CT 43.3)**

1. Monitor pipeline parameters to ensure normal facility operation (CT 43.3).
2. Monitor safety devices (CT 43.3).
3. Monitor purging during maintenance.
4. Monitor specific areas using remote video for operations.
5. Monitor weather conditions.

## **MODULE 60107-02 – FIELD QUALITY CONTROL**

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.

## **MODULE 60108-02 – FIELD MEASUREMENT**

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.



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## **LIQUID PIPELINE FIELD OPERATIONS**

### **Materials and Equipment**

#### **MODULE 60102-02 - BASIC PIPELINE HYDRAULICS AND EQUIPMENT**

- Transparencies
- Markers/chalk
- Blank acetate sheets
- Transparency pens
- Pencils and scratch paper
- Copies of Quick Quiz
- Module Examinations
- Performance Profile Sheets
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate personal protective equipment
- Copies of 49 CFR Part 195
- Copies of your company's policy and procedures manual
- A variety of P&ID drawings

#### **MODULE 60103-02 - PIPELINE COMMUNICATIONS**

- Transparencies
- Markers/chalk
- Blank acetate sheets
- Transparency pens
- Pencils and scratch paper
- Module Examinations
- Overhead projector and screen
- Whiteboard/chalkboard
- Appropriate personal protective equipment
- Copies of your company's policy and procedures manual
- Blank work order forms (one per trainee)
- Samples of nominations, product specs, product transfer orders, batch changes, and written confirmations
- Copies of Figure 1 or your company's call investigation report sheet
- A variety of educational brochures or items used to notify residents of pipeline systems
- Photos or pictures of various right-of-way markers
- Copies of 49 CFR Part 195

## **MODULE 60104-02 - PRODUCT BATCH AND PIG TRACKING**

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)

## **MODULE 60105-02 - ROUTINE FIELD AND FACILITY OPERATIONS**

Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Copies of Quick Quiz  
Module Examinations  
Performance Profile Sheets  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of your company's policy and procedures manual  
Copies of the Performance Verification for CT 43.1, 43.2, and 43.4  
Copies of 49 CFR Part 195  
Custody transfer tickets  
A sample pumping schedule  
A booked inventory and an actual physical inventory  
Sample tank farm personal protective equipment, including:  
    Respirators  
    Gloves  
    Eyewear  
    Radios  
    Gas test meters  
    Rags  
Damaged tools and equipment, including:  
    Damaged tapes  
    Damaged or low-quality gloves  
    Unapproved or inaccurate gauges or thermometers  
Several gauge tapes, plumb bobs, water-cut paste, buckets, and water  
Copies of a valve alignment chart and its corresponding standard operating procedures

## **MODULE 60106-02 - MONITORING PIPELINE OPERATIONS**

Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Module Examinations  
Performance Profile Sheets  
Copies of the Performance Verification for CT 43.3  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of your company's policy and procedures manual  
Copies of 49 CFR Part 195  
Smoke, fire, and flame detectors  
Television and VCR, video surveillance tape, and pilot observation record

## **MODULE 60107-02 - FIELD QUALITY CONTROL**

Transparencies  
Markers/chalk  
Blank acetate sheets  
Transparency pens  
Pencils and scratch paper  
Copies of Quick Quiz  
Module Examinations  
Performance Profile Sheets  
Overhead projector and screen  
Whiteboard/chalkboard  
Appropriate personal protective equipment  
Copies of your company's policy and procedures manual  
Assorted centrifuge tubes, including tubes used in the grind out and tubes that have not yet been tested  
 Draeger tube test unit with a selection of tubes  
Fuel samples and strips of copper to conduct a corrosion test

## MODULE 60108-02 - FIELD MEASUREMENT

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 custody tickets

Sample proving schedules for a variety of meters

Small volume pipe prover

A variety of orifice plates, including:

- Concentric orifice plates

- Eccentric orifice plates

- Segmental orifice plates

Copies of the API Manual of Petroleum Measurement Chapter 12, Section 2, Part 4

Copies of API Chapter 2 and API Standards 2550 and 2551

Some of the tools and equipment that may be used for general strapping procedures, including:

- Reels, handles, clamps, and ropes

- Jointed poles and ladders

- Gauges, straightedges, and calipers

- Rules, shovels, levels, awls, scribes, and brushes

Copies of API standards for strapping tanks and preparing documentation



# LIQUID PIPELINE FIELD OPERATIONS

## On-the-Job Training

### MODULE 66101-02 – INTRODUCTION TO THE PIPELINE INDUSTRY

Task Number	Item	Date(s)	Recorded By
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This is a knowledge-based module; there is no performance testing.

### MODULE 66102-02 – LIQUID PIPELINE GENERAL ABNORMAL OPERATING CONDITIONS

Task Number	Item	Date(s)	Recorded By
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This is a knowledge-based module; there is no performance testing.

### MODULE 60102-02 – BASIC PIPELINE HYDRAULICS AND EQUIPMENT

Task Number	Item	Date(s)	Recorded By
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60102-1	Identify and explain the types of valves used in pipelines.		
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### MODULE 60103-02 – PIPELINE COMMUNICATIONS

Task Number	Item	Date(s)	Recorded By
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This is a knowledge-based module; there is no performance testing.

### MODULE 60104-02 – PRODUCT BATCH AND PIG TRACKING

Task Number	Item	Date(s)	Recorded By
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60104-1	Track line inventory to ensure product quality.		
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60104-2	Identify interface changes to isolate batches.		
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60104-3	Track pigs to clean or inspect the pipeline.		
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## **MODULE 60105-02 – ROUTINE FIELD AND FACILITY OPERATIONS (CT 43.1, 43.2, and 43.4)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
60105-1	Perform visual facility checks.		
60105-2	Perform tank management procedures.		
60105-3	Operate valves (CT 43.4).		
60105-4	Operate facility pumping equipment.		
60105-5	Set alarm parameters.		
60105-6	Perform normal facility startup and shutdown procedures (CT 43.1 and 43.2).		
60105-7	Correctly perform batch switches.		
60105-8	Calculate facility over/short.		
60105-9	Complete required operations documentation.		

## **MODULE 60106-02 – MONITORING PIPELINE OPERATIONS (CT 43.3)**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
60106-1	Monitor pipeline parameters to ensure normal facility operation (CT 43.3).		
60106-2	Monitor safety devices (CT 43.3).		
60106-3	Monitor specific areas using remote video for operations.		

## **MODULE 60107-02 – FIELD QUALITY CONTROL**

<b>Task Number</b>	<b>Item</b>	<b>Date(s)</b>	<b>Recorded By</b>
60107-1	Activate tank mixing devices.		
60107-2	Take product samples.		
60107-3	Perform product testing.		
60107-4	Perform pipeline switching.		
60107-5	Perform blending operations.		
60107-6	Explain the use of and inject appropriate additives.		



## MODULE 60108-02 – FIELD MEASUREMENT

Task Number	Item	Date(s)	Recorded By
60108-1	Identify types of meters.		
60108-2	Maintain accurate measurement on all custody receipts and deliveries..		
60108-3	Verify meter accuracy.		
60108-4	Explain when and how to flush turbine meters.		
60108-5	Explain the need and frequency of waterdraws using provers.		