

MODULE OVERVIEW

This module discusses testing, repair, and replacement procedures for tanks. Trainees will learn to perform a variety of tank repair activities according to company procedures.

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 Maintenance Level One; Pipeline Maintenance Level Two; Pipeline Maintenance Level Three, Modules 62301-02 through 62306-02

OBJECTIVES

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

1. Tighten tank connection flanges and perform tank hot tapping.
2. Perform nondestructive testing on tanks.
3. Perform flange electrical insulating and welding on tanks.
4. Repair and replace tank bottoms.
5. Move tanks for repair and repair arc burns and welds.
6. Perform roof installation.
7. Demolish and build internal/external floating roof tanks.
8. Replace in-service seals on floating roof tanks and remove/install nozzles, manways, and sumps.

PERFORMANCE TASKS

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

1. Perform tank repair activities per company procedure and/or using the tank repair critical steps checklist provided by your instructor.

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	Bolts and nuts
Markers/chalk	Variety of flanges with different numbers of bolts
Blank acetate sheets	Sample radiograph films
Transparency pens	Weld maps
Pencils and scratch paper	Ultrasonic monitor
Module Examinations*	Insulated flanges and bolts
Performance Profile Sheets*	Insulator checker
Overhead projector and screen	Procedure documentation for roof jacking
Whiteboard/chalkboard	Photos of arc burns
Appropriate personal protective equipment	Inspection tags
Copies of <i>49 CFR Part 192 (Gas)</i> and/or <i>49 CFR Part 195 (Liquid)</i>	Drawings that show mark locations on shell, bottom, and roof plates
Copies of your company policy and procedures manual	<i>Figure 20</i> with the callouts covered
Copies of <i>API Standards 650</i> and <i>653</i>	Aqueous film-forming foam with a fire extinguisher applicator

* 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 introduces trainees to the various types of bearings. Trainees will have an opportunity to practice removing, troubleshooting, and installing bearings.

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 Mechanical Level One; Pipeline Mechanical Level Two, Modules 63201-02 through 63208-02

OBJECTIVES

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

1. Identify and explain various types of bearings.
2. Explain bearing designation.
3. Remove, troubleshoot, and install bearings.

PERFORMANCE TASKS

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

1. Identify types of bearings and explain how they work.
2. Explain bearing designation.
3. Troubleshoot bearings.
4. Remove bearings.
5. Install bearings.

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	Equipment required for installing standard sleeve bearings
Markers/chalk	A bearing that failed due to fatigue and a bearing that failed due to overload
Blank acetate sheets	Bearings that have failed for various reasons
Transparency pens	Equipment and materials required for packing a bearing
Pencils and scratch paper	Equipment required for removing a bearing using a manual bearing puller
Module Examinations*	Equipment required for removing a bearing using a press
Performance Profile Sheets*	Equipment required for removing a bearing using the hydraulic method
Overhead projector and screen	Equipment required for removing a bearing using the temperature method
Whiteboard/chalkboard	Equipment required for installing tapered roller bearings using the temperature mounting method
Appropriate personal protective equipment	Equipment required for installing a thrust bearing using the press mounting method
Copies of your company's policy and procedures manual	Equipment required for installing spherical roller bearings using a hydraulic nut or locknut
Assorted plain bearings	Split-housing pillow block bearings and equipment needed to assemble/disassemble them
Assorted ball bearings	Equipment and materials for troubleshooting, removing, and repairing or replacing bearings
Roller bearings	
Plain, roller, and ball flanged bearings	
One- and two-piece pillow block bearings and takeup bearings	
Bearings with various identification codes	
Used bearings, lintless rags, clean oil, 3-volt ohmmeter, Permatex [®] or Teflon [®] tape, fine-tooth file	
Plain bearings and appropriate tools for disassembling and reassembling them	

* 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 introduces the types of mechanical seals and their classification. Trainees will learn to remove, inspect, and install mechanical seals.

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 Mechanical Level One; Pipeline Mechanical Level Two, Modules 63201-02 through 63209-02

OBJECTIVES

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

1. Identify and explain types of mechanical seals.
2. Explain mechanical seal classification.
3. Remove, inspect, and install mechanical seals.

PERFORMANCE TASKS

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

1. Identify types of mechanical seals and explain how they work.
2. Explain mechanical seal classification.
3. Remove a mechanical seal.
4. Troubleshoot a mechanical seal.
5. Install a mechanical seal.

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	Appropriate personal protective equipment
Markers/chalk	Copies of the Quick Quiz**
Blank acetate sheets	Copies of your company's policy and procedures manual
Transparency pens	Several types of mechanical seals
Pencils and scratch paper	Examples of failed mechanical seals
Module Examinations*	Equipment required for removing and inspecting mechanical seals from a pump
Performance Profile Sheets*	Equipment required for installing mechanical seals on a pump
Overhead projector and screen	
Whiteboard/chalkboard	

** 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 will familiarize trainees with the different types of drivers used to activate pumps and other equipment in a pipeline. Trainees will learn how to inspect and replace drivers, bearings, and seals. They will also learn how to maintain drivers.

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 Mechanical Level One; Pipeline Mechanical Level Two, Modules 63201-02 through 63210-02

OBJECTIVES

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

1. Identify types of drivers.
2. Inspect drivers.
3. Replace bearings and seals.
4. Perform preventive maintenance activities.
5. Replace drivers.

PERFORMANCE TASKS

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

1. Identify types of drivers.
2. Inspect drivers.
3. Replace bearings and seals.
4. Perform preventive maintenance activities.
5. Replace drivers.

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	Sample engine power ratings
Markers/chalk	Examples or photos of electric, diesel, gas, and turbine drivers
Blank acetate sheets	New bearings
Transparency pens	Examples of various types of failed bearings
Pencils and scratch paper	Access to bearings requiring replacement
Module Examinations*	Equipment required to remove and install bearings
Performance Profile Sheets*	Access to pipeline drivers
Overhead projector and screen	Equipment required for driver maintenance
Whiteboard/chalkboard	Access to a driver requiring replacement
Appropriate personal protective equipment	Equipment required to replace drivers
Copies of your company's policy and procedure manual	

* 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 discusses methods of inspecting and preparing rotating equipment for installation. Trainees will learn how to install rotating equipment and to relieve pipe stress from rotating equipment.

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 Mechanical Levels One and Two

OBJECTIVES

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

1. Identify inspection requirements for an equipment pad.
2. Describe the requirements for equipment base preparation.
3. Inspect equipment prior to installation.
4. Prepare equipment prior to installation.
5. Describe the installation process for rotating equipment.
6. Describe the process to relieve pipe stress from rotating equipment.

PERFORMANCE TASKS

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

1. Identify and describe the inspection requirements for an equipment pad.
2. Describe, inspect, and prepare equipment prior to installation.
3. Describe the installation process for rotating equipment.
4. Describe the process to relieve pipe stress from rotating equipment.

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	Tools and equipment necessary to level base plates, including:
Markers/chalk	Jack bolts
Blank acetate sheets	Anchor bolts
Transparency pens	Shims
Pencils and scratch paper	Wrenches
Calculators	Wedges
Module Examinations*	Hammers
Performance Profile Sheets*	Levels
Overhead projector and screen	Shim packs
Whiteboard/chalkboard	Straightedges
Appropriate personal protective equipment	Feeler gauges
Copies of <i>49 CFR Part 192</i> (Gas) and/or <i>49 CFR Part 195</i> (Liquid)	Tools and materials necessary to perform clearance and interference installation, including:
Copies of your company policy and procedures manual	Brass hammers
A variety of base plates	Key and setscrew couplings
Installation drawings	Cleaning solvents
Sample pumps and/or motors with physical damage	Shop clothes
Sample base plates that are warped, damaged, or cracked	Tapered shafts
Equipment to perform the bearing heating method	Locking nuts
	Micrometers
	Nonshrink and epoxy grout
	Forms to practice grouting
	Tools to work the grout

* 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 explains how to recognize and correct equipment misalignment. Trainees will learn how to identify and correct soft foot and to perform conventional, rim-and-face dial indicator, reverse dial indicator, and laser alignment.

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 Mechanical Levels One and Two; Pipeline Mechanical Level Three, Module 63301-02

OBJECTIVES

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

1. Recognize and describe the four types of equipment misalignment.
2. Identify the causes of soft foot.
3. Describe the major steps in performing conventional rim-and-face alignment.
4. Describe the major steps in performing reverse dial indicator alignment using the equation method of alignment.
5. Describe the major steps in performing reverse dial indicator alignment using the graphical chart method of alignment.
6. Describe the major steps in performing laser alignment.
7. Identify other laser alignment procedures that may be completed on the machinery trains depending on equipment needs.

PERFORMANCE TASKS

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

1. Recognize and describe the four types of equipment misalignment.
2. Describe the major steps in performing each of the following:
 - Conventional rim-and-face alignment
 - Reverse dial indicator alignment using the equation method of alignment
 - Reverse dial indicator alignment using the graphical chart method of alignment
 - Laser alignment

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	Copies of <i>Figures 1, 2, 3, 4, 23, 24, and 25</i> with the titles covered
Markers/chalk	
Blank acetate sheets	Copies of <i>Figure 33</i> with the callouts covered
Transparency pens	Alignment simulators
Pencils and scratch paper	Dial calipers
Module Examinations*	Straightedges
Performance Profile Sheets*	Scales
Copies of Quick Quiz**	Rules
Overhead projector and screen	Feeler gauges
Whiteboard/chalkboard	Chain indicator jigs
Appropriate personal protective equipment	Dial indicators
Copies of <i>49 CFR Part 192 (Gas)</i> and/or <i>49 CFR Part 195 (Liquid)</i>	Graphical alignment charts
Copies of your company policy and procedures manual	Graph paper
Calculators	Reverse indicator plotting guides
	Sample alignment records

** 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.

Course Planning Tools

MODULE OVERVIEW

This module discusses the causes of vibration and explains vibration analysis. Trainees will learn to identify the different kinds of basic vibration test equipment and to explain vibration monitoring and field balancing.

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 Mechanical Levels One and Two; Pipeline Mechanical Level Three, Modules 63301-02 and 63302-02

OBJECTIVES

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

1. Explain the causes of vibration.
2. Explain vibration analysis.
3. Identify and explain the different kinds of basic vibration test equipment.
4. Explain vibration monitoring.
5. Explain field balancing of machines.

PERFORMANCE TASK

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

1. Identify and explain the different kinds of basic vibration test equipment.

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 Task, 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	A variety of transducers, including:
Markers/chalk	Velocity transducers
Blank acetate sheets	Accelerometers
Transparency pens	Displacement transducers
Pencils and scratch paper	A variety of vibration test equipment, including:
Module Examinations*	Meters
Performance Profile Sheets*	Oscilloscopes
Overhead projector and screen	Spectrum analyzers
Whiteboard/chalkboard	Electronic filters
Appropriate personal protective equipment	Stroboscopes
Copies of <i>49 CFR Part 192</i> (Gas) and/or <i>49 CFR Part 195</i> (Liquid)	A variety of vibration recording instruments, including strip chart recorders and data collectors
Copies of your company policy and procedures manual	Sample vibration monitoring forms

* 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 introduces common pump troubleshooting and maintenance procedures. Trainees will learn how to prepare a pump for shutdown, as well as how to remove, disassemble, reassemble, and install a pump.

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 Mechanical Levels One and Two; Pipeline Mechanical Level Three, Modules 63301-02 through 63303-02

OBJECTIVES

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

1. Describe the preventive maintenance requirements for a pump.
2. Describe the inspection requirements for a pump.
3. Identify common troubleshooting techniques and problems for a pump.
4. Identify the common steps required to prepare a pump for shutdown for maintenance or repair.
5. Identify the common steps required to remove a pump from a pipeline system for maintenance or repair.
6. Identify the common steps to disassemble and reassemble a pump.
7. Identify the common steps required to install the pump after the pump has been reassembled.
8. Identify the common steps to prepare the pump for startup and operational check after maintenance or repair has been completed.

PERFORMANCE TASKS

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

1. Describe the preventive maintenance requirements for a pump.
2. Describe the inspection requirements for a pump.
3. Demonstrate common troubleshooting techniques and identify common problems for a pump.
4. Demonstrate the common steps to perform each of the following:
 - Prepare a pump for shutdown for maintenance or repair.
 - Remove a pump from a pipeline system for maintenance or repair.
 - Disassemble and reassemble a pump.
 - Install a pump after it has been reassembled.
 - Prepare a pump for startup and operation check after maintenance or repair has been completed.

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	Appropriate personal protective equipment
Markers/chalk	Copies of <i>49 CFR Part 192</i> (Gas) and/or <i>49 CFR Part 195</i> (Liquid)
Blank acetate sheets	Copies of your company policy and procedures manual
Transparency pens	Completed inspection reports
Pencils and scratch paper	Sample manufacturers' manuals, including procedures, schematics, and line drawings
Module Examinations*	Copies of <i>Figure 13</i> with the callouts covered
Performance Profile Sheets*	
Overhead projector and screen	
Whiteboard/chalkboard	

* 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 the types and designs of gas compressors. Trainees will learn to identify and demonstrate the procedures to maintain, troubleshoot, and repair gas compressors.

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 Mechanical Levels One and Two; Pipeline Mechanical Level Three, Modules 63301-02 through 63304-02

OBJECTIVES

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

1. Identify the typical lubrication system components of a gas compressor.
2. Describe the preventive maintenance requirements for a gas compressor.
3. Identify the common troubleshooting techniques for a gas compressor.
4. Identify the common steps required to prepare for shutdown and repair of a gas compressor.
5. Identify the common steps required to isolate a gas compressor from a pipeline system.
6. Identify the common steps required to repair a rotary and reciprocating gas compressor.
7. Identify the common steps required to prepare the gas compressor for start-up and operational check after maintenance has been completed.

PERFORMANCE TASKS

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

1. Identify the typical lubrication system components of a gas compressor.
2. Describe the preventive maintenance requirements for a gas compressor.
3. Demonstrate common troubleshooting techniques for a gas compressor.
4. Demonstrate the common steps to perform each of the following:
 - Prepare a gas compressor for shutdown and repair.
 - Isolate a gas compressor from a pipeline system.
 - Repair a rotary and reciprocating gas compressor.
 - Prepare the gas compressor for start-up and operational check after maintenance or repair has been completed.

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	Couplings
Markers/chalk	Lubricant
Blank acetate sheets	Fasteners
Transparency pens	Oil
Pencils and scratch paper	Straightedges
Module Examinations*	Tools and materials to repair common reciprocating compressor components, including:
Performance Profile Sheets*	Crossheads
Overhead projector and screen	Drive chains
Whiteboard/chalkboard	Screws
Appropriate personal protective equipment	Nuts
Copies of <i>49 CFR Part 192 (Gas)</i> and/or <i>49 CFR Part 195 (Liquid)</i>	Dust plugs
Copies of your company policy and procedures manual	Sprockets
Copies of <i>Figures 1, 2, and 3</i> with the callouts covered	Drift punches
Copies of manufacturers' specifications for gas compressors	Washers
Copies of manufacturers' maintenance manuals, including recommended startup checklists	Valve caps
Gas compressors on which to practice maintenance and repair techniques	Bolts
Tools and materials to repair common rotary compressor components, including:	O-rings
Mechanical seals	Machinist's rules
O-rings	Lube oil pump chain sprockets
Thread caulking	Sprocket setscrews
Silicone caulking	Woodruff keys
Oil pumps	Gaskets
	Metal files
	Lubricator
	Pry bars
	Screwdrivers
	Valve tools
	Anti-seize lubricant
	Valve retainer
	Lubricant
	Sample documentation for startup and operational checks

* 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 the techniques used to inspect, maintain, and repair metering devices and provers. Trainees will learn how to repair and calibrate prover systems.

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 Mechanical Levels One and Two; Pipeline Mechanical Level Three, Modules 63301-02 through 63308-02

OBJECTIVES

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

1. Inspect and maintain metering devices.
2. Repair metering devices.
3. Inspect and maintain prover systems.
4. Repair prover systems.
5. Calibrate prover systems.

PERFORMANCE TASKS

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

1. Inspect, maintain, and repair metering devices.
2. Inspect, maintain, and repair prover systems.
3. Calibrate prover systems.

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	Typical strainer assembly
Markers/chalk	Tools and materials to clean a typical strainer assembly and to disassemble a turbine meter
Blank acetate sheets	Meter clearance records
Transparency pens	Practice meters
Pencils and scratch paper	Appropriate measuring gauges
Module Examinations*	Components of a disassembled positive displacement meter
Performance Profile Sheets*	Materials to clean positive displacement meter components
Overhead projector and screen	Proving spheres
Whiteboard/chalkboard	Calipers
Appropriate personal protective equipment	Sizing rings
Copies of <i>49 CFR Part 192 (Gas)</i> and/or <i>49 CFR Part 195 (Liquid)</i>	Steel tape
Copies of your company policy and procedures manual	
<i>API Manual of Petroleum Measurement Standards</i>	

* 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.