Module Overview

This module provides an overview of a pipefitter’s role in the maritime industry. Coverage includes pipefitter duties and responsibilities, characteristics required for success, and a description of apprentice training based on the NCCER curriculum. Emphasis is placed on safety hazards.

Objectives

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

1. Identify the types of work that a maritime pipefitter does and the characteristics required for success.
2. Explain the basic structure of an apprentice training program and identify career opportunities available to maritime pipefitters.
3. Describe the importance of safety and basic safety guidelines related to maritime pipefitting.

Performance Tasks

This is a knowledge-based module; there are no performance tasks.

Materials and Equipment

- Multimedia projector and screen
- Computer
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- Module Examinations*

* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.
Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Review safety guidelines associated with working on maritime piping systems. Emphasize the importance of proper housekeeping.

Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.


Teaching Time for This Module

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 5 hours are suggested to cover *Orientation to the Maritime Pipefitting Trade*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Planned Time</th>
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<tbody>
<tr>
<td><strong>Session I. Introduction; Maritime Pipefitting Work; Characteristics for Success; Your Training Program; Opportunities in the Trade</strong></td>
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<tr>
<td>A. Introduction</td>
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<tr>
<td>B. Maritime Pipefitting Work</td>
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<tr>
<td>1. Tools of the Trade</td>
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<td>C. Characteristics for Success</td>
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<tr>
<td>1. Professionalism</td>
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<td>2. Honesty</td>
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<td>3. Loyalty</td>
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<td>4. Willingness to Learn</td>
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<td>5. Willingness to Take Responsibility</td>
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<td>6. Willingness to Cooperate</td>
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<td>7. Rules and Regulations</td>
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<td>8. Tardiness and Absenteeism</td>
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<td>9. Human Relations</td>
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<tr>
<td>D. Your Training Program</td>
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<tr>
<td>1. Apprenticeship Program</td>
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<tr>
<td>E. Opportunities in the Trade</td>
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<tr>
<td><strong>Session II. Employer and Employee Safety Obligations; Review and Testing</strong></td>
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<tr>
<td>A. Employer and Employee Safety Obligations</td>
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<tr>
<td>1. Safety on the Job</td>
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<tr>
<td>B. Review</td>
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<tr>
<td>C. Module Examination</td>
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<tr>
<td>1. Trainees must score 70% or higher to receive recognition from NCCER.</td>
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<tr>
<td>2. Record the testing results on Training Report Form 200 and submit the results to the Training Program Sponsor.</td>
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</table>
Module Overview

This module explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and use the Pythagorean theorem to solve for right triangles and calculate piping offsets.

Objectives

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

1. Identify and explain the use of measuring devices used with scale drawings.
2. Explain how to calculate piping offsets various ways, including using the Pythagorean theorem.
3. Use conversion tables of weights, measurement, and volume.
4. Use formulas to solve basic problems.
5. Solve mathematical problems related to the following:
   - Area
   - Volume
   - Circumference

Performance Tasks

This is a knowledge-based module; there are no performance tasks.

Materials and Equipment

<table>
<thead>
<tr>
<th>Multimedia projector and screen</th>
<th>Calculators</th>
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</thead>
<tbody>
<tr>
<td>Computer</td>
<td>Architect’s scale</td>
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<tr>
<td>Whiteboard/chalkboard</td>
<td>Engineer’s scale</td>
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<tr>
<td>Markers/chalk</td>
<td>Metric scale</td>
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<tr>
<td>Pencils and paper</td>
<td>Module Examinations*</td>
</tr>
</tbody>
</table>

* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.
Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites or utility areas. Ensure that they are briefed on site safety procedures. Review safety guidelines associated with measuring and cutting pipe in the maritime environment. Emphasize the importance of proper housekeeping.

Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.

- *The Pipe Fitters Blue Book*. W.V. Graves. Webster, TX: Graves Publisher.

Teaching Time for This Module

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. Approximately 17.5 hours are suggested to cover *Maritime Pipefitting Trade Math*. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. A majority of sessions will be spent in laboratories. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

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<thead>
<tr>
<th>Topic</th>
<th>Planned Time</th>
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<tbody>
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<td>Session I. Introduction; Special Measuring Devices</td>
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<tr>
<td>A. Introduction</td>
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<td>B. Special Measuring Devices</td>
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<tr>
<td>1. Architect’s Scale</td>
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<td>2. Engineer’s Scale</td>
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<tr>
<td>3. Metric Scale</td>
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<td>Session II. Calculating Piping Offsets</td>
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<tr>
<td>A. Calculating Piping Offsets</td>
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<tr>
<td>1. Pythagorean Theorem</td>
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<td>2. Calculating 45-Degree Offsets</td>
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<td>3. Calculating Offsets Using Multipliers</td>
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<td>4. Calculating Travel of Rolling Offset</td>
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<td>Session III. Using Tables</td>
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<td>A. Using Tables</td>
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<tr>
<td>1. Comparative Value Tables</td>
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<td>2. Mathematical Tables</td>
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</tbody>
</table>
Session IV. Using Formulas
   A. Using Formulas
      1. Symbolism
      2. Expressing Rules as Formulas
      3. Factors
      4. Powers
      5. Roots
      6. Evaluating Formulas

Session V. Solving Area Problems; Solving Circumference Problems
   A. Solving Area Problems
      1. Finding the Area of Rectangles
      2. Finding the Area of Triangles
      3. Finding the Area of Circles
   B. Solving Circumference Problems

Session VI. Solving Volume Problems
   A. Solving Volume Problems
      1. Finding Volume of Rectangular Solids
      2. Finding the Volume of Cylinders
      3. Finding Volume of Spheres
      4. Finding the Volume of Pyramids
      5. Finding Volume of Cones

Session VII. Review and Testing
   A. Review
   B. Module Examination
      1. Trainees must score 70% or higher to receive recognition from NCCER.
      2. Record the testing results on Training Report Form 200 and submit the results to the Training Program Sponsor.
Module Overview

This module covers general hand tool safety and procedures for identifying, selecting, inspecting, using, and caring for pipe vises and stands, pipe wrenches, levels, pipe fabrication tools, and pipe bending and flaring tools.

Objectives

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

1. Describe the safety requirements that apply to the use of pipefitter hand tools.
2. Explain how to properly care for selected pipefitter hand tools.
3. Explain how to safely and properly use selected pipefitter hand tools.
4. Identify tools and state their uses.

Performance Tasks

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

1. Identify various pipefitting hand tools.
2. Secure a section of pipe in a vise and pipe stand.
3. Properly use the following:
   - Straight pipe wrenches
   - Offset pipe wrenches
   - Chain wrenches
   - Strap wrenches
   - Laser level
   - Torpedo and larger levels
   - Tubing water level
   - Center finder
   - Manual pipe threading tools
4. Check square and level:
   - Turn tongue 180 degrees from where it was
   - Flip level to ensure it is level

Materials and Equipment

Multimedia projector and screen
Computer
Whiteboard/chalkboard
Markers/chalk
Pencils and paper
Appropriate personal protective equipment
Assorted diameters of pipe
Assorted diameters of tubing at various lengths
Conduit
Chain vises
Yoke vises
Strap vises
Various jacks, stands, rollers, and supports
Straight pipe wrenches
Offset pipe wrenches
Compound leverage wrenches
Chain wrenches
Pipe tongs
Strap wrenches
Open-end wrenches
Adjustable wrenches
Framing levels
Torpedo levels
Laser levels
Tubing water levels
Framing squares
Pipefitter’s squares
Combination tri-squares
Center finders
Straight butt welding clamps
Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.

**Safety Considerations**

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires trainees to use hand tools. Emphasize basic hand tool safety.

**Additional Resources**

This module presents thorough resources for task training. The following resource material is suggested for further study.


**Teaching Time for This Module**

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2 1/2 hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Pipefitting Hand Tools*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Planned Time</th>
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<tbody>
<tr>
<td>Session I. Introduction; General Hand Tool Safety; Vises and Stands</td>
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<tr>
<td>A. Introduction</td>
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<tr>
<td>B. General Hand Tool Safety</td>
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<tr>
<td>C. Vises and Stands</td>
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<tr>
<td>1. Pipefitter’s Vises</td>
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<tr>
<td>2. Pipe Jack Stands</td>
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<tr>
<td>D. Laboratory</td>
<td>Have trainees practice securing a section of pipe in a stand. This laboratory corresponds to Performance Task 2.</td>
</tr>
</tbody>
</table>
Session II. Pipe Wrenches
A. Pipe Wrenches
   1. Pipe Wrench
   2. Pipe Tongs
   3. Strap Wrench
   4. Common Wrenches
   5. Using a Pipe Wrench
   6. Using and Caring for Pipe Wrenches
B. Laboratory
   Have trainees practice using various types of wrenches. This laboratory corresponds to Performance Task 3.

Session III. Levels
A. Levels
   1. Framing Levels
   2. Torpedo Levels
   3. Measuring Using Spirit Levels
   4. Laser Leveling Instruments
   5. Tubing Water Level
B. Laboratory
   Have trainees practice using various types of levels. This laboratory corresponds to Performance Task 3.

Sessions IV and V. Pipe Fabrication Tools
A. Pipe Fabrication Tools
   1. Framing Squares
   2. Combination Tri-Squares
   3. Center Finders
   4. Pipe Line-Up Clamps
   5. Hi-Lo Gauges
   6. Wraparounds
   7. Drift Pins
   8. Flange Alignment Pins
   9. Flange Spreaders
B. Laboratory
   Have trainees practice checking square and level. This laboratory corresponds to Performance Task 4.
Session VI. Pipe Cutting Tools; Benders and Flaring Tools
A. Pipe Cutting Tools
   1. Hacksaws
   2. Tube and Pipe Cutters
   3. Manual Tube and Pipe Reamers
   4. Tube Expanders
   5. Manual Pipe Threaders
   6. Pipe Threaders
   7. Pipe Taps
B. Benders and Flaring Tools
   1. Lever Compression Tube Benders
   2. Flaring Tools

Session VII. Pipe Fabrication Tools Laboratory
A. Laboratory
   Have trainees practice using a center finder and manual pipe threading tools.
   This laboratory corresponds to Performance Task 3.

Session VIII. Maritime Pipefitter’s Toolbox; Review and Testing
A. The Maritime Pipefitter’s Toolbox
B. Laboratory
   Have trainees identifying various pipefitting hand tools. This laboratory
   corresponds to Performance Task 1.
C. Review
D. Module Examination
   1. Trainees must score 70 percent or higher to receive recognition from NCCER.
   2. Record the testing results on Training Report Form 200, and submit the
      results to the Training Program Sponsor.
E. Performance Testing
   1. Trainees must perform each task to the satisfaction of the instructor to receive
      recognition from NCCER. If applicable, proficiency noted during laboratory
      exercises can be used to satisfy the Performance Testing requirements.
   2. Record the testing results on Training Report Form 200, and submit the
      results to the Training Program Sponsor.
Module Overview

This module identifies the hazards and explains general safety procedures that must be followed when using power tools. It provides specific guidelines for using electric and pneumatic power tools.

Objectives

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

1. State the safety and visual inspection procedures to be followed when working with power tools.
2. Identify and explain how to use portable grinders and saws.
3. Explain how to operate and maintain pipe threading equipment.
4. Describe various pipe beveling processes and identify the equipment used in pipe beveling.

Performance Tasks

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

2. Cut pipe using a portable grinder.
4. Replace the dies in a threading machine.
5. Cut, ream, and thread pipe using a threading machine.
6. Cut and thread nipples using a nipple chuck.
7. Thread pipe using a portable power drive.

Materials and Equipment List

Multimedia projector and screen
Maritime Pipefitting Level One PowerPoint®
Computer
Whiteboard/chalkboard
Markers/chalk
Pencils and scratch paper
Appropriate personal protective equipment
Face shields
Gloves
Ground fault circuit interrupter
Abrasive saws
Portable band saws and accessories
Portable grinders and accessories
Assorted lengths of 1-, 1½-, and 2-inch pipe
Assorted lengths of 3-, 4-, and 6-inch pipe
Cut and beveled pipe
Soapstone
Band saw blades
Tripod chain vise
Wraparounds
Grinding wheels
Measuring tapes
Spanner wrenches
Geared threaders and accessories
Thread cutting oil
Nipple chucks
RIDGID® 300 power drive
RIDGID® 535 power drive
Pipe bevelers
Module Examinations*
Performance Profile Sheets* 

* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.
Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires trainees to use power tools. Review basic power tool safety, electrical safety, and eye and hand protection.

Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.


Teaching Time for This Module

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover *Pipefitting Power Tools*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

<table>
<thead>
<tr>
<th>Topic</th>
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<td><strong>Session I. Introduction; Safety; Power Saws</strong></td>
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<td>A. Introduction</td>
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<td>B. Power Tool Safety</td>
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<td>1. Electric Power Tool Safety</td>
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<td>2. Pneumatic Power Tool Safety</td>
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<td>C. Power Saws</td>
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<tr>
<td>1. Portable Band Saws</td>
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<td>2. Abrasive Saws</td>
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<tr>
<td>D. Laboratory</td>
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<tr>
<td>Have trainees practice cutting pipe using a portable band saw. This laboratory corresponds to Performance Task 1.</td>
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<tr>
<td><strong>Session II. Portable Grinders</strong></td>
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<td>A. Portable Grinders</td>
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<td>1. Portable Grinder Safety</td>
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<td>2. Types of Portable Grinders</td>
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<td>3. Grinder Attachments</td>
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<td>4. Inspecting Grinders Before Use</td>
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<td>5. Operating Grinders</td>
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<td>B. Laboratory</td>
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<tr>
<td>Have trainees practice using a portable grinder to cut and bevel pipe. This laboratory corresponds to Performance Tasks 2 and 3.</td>
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</tbody>
</table>
Session III. Pipe Threading Machines, Part 1

A. Pipe Threading Machines
   1. Loading Pipe into a Threading Machine
   2. Cutting and Reaming Pipe
   3. Performing Threading Operations
   4. Replacing Dies in Threading Machine
   5. Laboratory
      Have trainees practice replacing dies in a threading machine.
      This laboratory corresponds to Performance Task 4.

B. Machine Maintenance
   1. Laboratory
      Have trainees practice cutting, reaming, and threading pipe using a
      threading machine. This laboratory corresponds to Performance Task 5.

Sessions IV and V. Pipe Threading Machines, Part 2; Pipe Beveling Equipment

A. Pipe Threading Machines
   1. Special Threading Applications
   2. Laboratory
      Have trainees practice cutting and threading nipples using a nipple chuck.
      This laboratory corresponds to Performance Task 6.
   3. Portable Power Drives
   4. Laboratory
      Have trainees practice threading pipe using a portable power drive.
      This laboratory corresponds to Performance Task 7.

B. Pipe Beveling Equipment
   1. Mechanical Beveling Equipment
   2. Thermal Beveling Equipment

Session VI. Review and Testing

A. Review

B. Module Examination
   1. Trainees must score 70 percent or higher to receive recognition from NCCER.
   2. Record the testing results on Training Report Form 200, and submit the results
to the Training Program Sponsor.

C. Performance Testing
   1. Trainees must perform each task to the satisfaction of the instructor to receive
      recognition from NCCER. If applicable, proficiency noted during laboratory
      exercises can be used to satisfy the Performance Testing requirements.
   2. Record the testing results on Training Report Form 200, and submit the results
to the Training Program Sponsor.
Module Overview

This module explains the safety requirements for oxyfuel cutting. It identifies oxyfuel cutting equipment and setup requirements. It explains how to light, adjust, and shut down oxyfuel equipment. Trainees will perform cutting techniques that include straight line, piercing, bevels, and washing.

Objectives

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

1. Identify the safety equipment and procedures required for oxyfuel cutting.
2. Identify and explain the use of oxyfuel cutting equipment.
3. Explain how to set up, operate, and shut down oxyfuel equipment.
4. Describe the characteristics of oxyfuel tanks and manifolds.
5. Explain how to perform various oxyfuel cutting procedures.

Performance Tasks

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

1. Set up oxyfuel equipment.
2. Properly light and adjust an oxyfuel cutting torch.
3. Properly shut down oxyfuel cutting equipment.
5. Use an oxyfuel bevel cutting machine to bevel a pipe.
6. Perform washing.
7. Perform gouging.

Materials and Equipment

Multimedia projector and screen
Computer
Whiteboard/chalkboard
Markers/chalk
Pencils and paper
Appropriate personal protective equipment
Safety goggles
Face shields
Welding helmets
Ear protection
Welding cap
Leather jacket
Leather pants or chaps
Gauntlet-type welding gloves
Respirators
ANSI Z49.1-1999
OSHA 29 CFR 1910.146

MSDS for cutting products
Oxygen cylinder with cap
Fuel gas cylinder with cap
Regulators (oxygen and fuel gas)
Hose set
One-piece cutting torch
Combination cutting torch and torch tips
Assorted acetylene, liquefied fuel gas, and special-purpose cutting torch tips
Tip cleaners
Tip drills
Mechanical guide
Cylinder cart
Motorized oxyfuel track cutter
Framing squares
Combination squares with protractor head
Tape measure
Soapstone
Penknife
Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires that the trainees operate oxyfuel cutting equipment. Ensure that trainees are briefed on fire and shop safety policies prior to performing any work. Emphasize the special safety precautions associated with the use of cylinders and oxyfuel cutting equipment.

Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.


Teaching Time for This Module

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2 1/2 hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 17.5 hours are suggested to cover Oxyfuel Cutting. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

<table>
<thead>
<tr>
<th>Topic</th>
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<tbody>
<tr>
<td><strong>Session I. Introduction; Oxyfuel Safety Summary; Oxyfuel Cutting Equipment</strong></td>
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<tr>
<td>A. Introduction</td>
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<tr>
<td>B. Oxyfuel Cutting Safety</td>
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<tr>
<td>1. Protective Clothing and Equipment</td>
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<td>2. Fire/Explosion Prevention</td>
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<td>3. Work Area Ventilation</td>
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<td>4. Confined Space Work</td>
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<td>5. Area Safety</td>
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<td>6. Cylinder Storage and Handling</td>
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</tbody>
</table>

* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.
C. Oxyfuel Cutting Equipment
   1. Oxygen
   2. Acetylene
   3. Liquefied Fuel Gases
   4. Regulators
   5. Hoses
   6. Cutting Torches
   7. Cutting Torch Tips
   8. Tip Cleaners and Tip Drills
   9. Friction Lighters
  10. Cylinder Cart
  11. Soapstone Markers
  12. Specialized Cutting Equipment

Session II. Setting Up Oxyfuel Equipment
   A. Setting Up Oxyfuel Equipment
      1. Transporting and Securing Cylinders
      2. Cracking Cylinder Valves
      3. Attaching Regulators
      4. Installing Flashback Arrestors or Check Valves
      5. Connecting Hoses to Regulators
      6. Attaching Hoses to the Torch
      7. Connecting Cutting Attachments (Combination Torch Only)
      8. Installing Cutting Tips
      9. Closing Torch Valves and Loosening Regulator Adjusting Screws
     10. Opening Cylinder Valves
     11. Purging the Torch and Setting the Working Pressures
     12. Testing for Leaks
   B. Laboratory
      Have trainees practice setting up oxyfuel equipment.
      This laboratory corresponds to Performance Task 1.

Sessions III and IV. Controlling the Oxyfuel Torch Flame; Shutting Down Oxyfuel Cutting Equipment; Changing Cylinders
   A. Controlling the Oxyfuel Torch Flame
      1. Oxyfuel Flames
      2. Backfires and Flashbacks
      3. Igniting the Torch and Adjusting the Flame
      4. Shutting Off the Torch
      5. Laboratory
         Have trainees practice lighting and adjusting an oxyfuel cutting torch.
         This laboratory corresponds to Performance Task 2.
   B. Shutting Down Oxyfuel Equipment
      1. Laboratory
         Have trainees practice shutting down an oxyfuel cutting outfit.
         This laboratory corresponds to Performance Task 3.
C. Disassembling Oxyfuel Equipment

D. Changing Empty Cylinders
   1. Laboratory
      Have trainees practice changing empty cylinders on an oxyfuel cutting outfit.
      This laboratory corresponds to Performance Task 4.

Sessions V and VI. Performing Cutting Procedures; Plasma Arc Cutting (PAC)
A. Performing Cutting Procedures
   1. Inspecting the Cut
   2. Preparing for Oxyfuel Cutting with a Hand Cutting Torch
   3. Cutting Thin Steel
   4. Cutting Thick Steel
   5. Piercing
   6. Cutting and Beveling Pipe
   7. Washing
   8. Gouging
B. Plasma Arc Cutting (PAC)
C. Laboratory
   1. Have trainees practice beveling pipe with a bevel cutting machine.
      This laboratory corresponds to Performance Task 5.
   2. Have trainees practice washing with an oxyfuel cutting torch.
      This laboratory corresponds to Performance Task 6.
   3. Have trainees practice gouging with an oxyfuel cutting torch.
      This laboratory corresponds to Performance Task 7.

Session VII. Review and Testing
A. Review
B. Module Examination
   1. Trainees must score 70 percent or higher to receive recognition from NCCER.
   2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.
C. Performance Testing
   1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
   2. Record the testing results on Training Report Form 200, and submit the results to the Training Program Sponsor.
Module Overview

This module covers hazards and general safety procedures governing the use of stepladders, straight and extension ladders, fixed and rolling scaffolds, personnel lifts, and rescue after a fall.

Objectives

Upon completion of this module, the trainee will be able to do the following:
1. Identify the different types of ladders and scaffolding used on a work site.
2. Describe how to safely use ladders and scaffolding.

Performance Tasks

Under the supervision of the instructor, the trainee should be able to do the following:
1. Select, inspect, and use stepladders.
2. Select, inspect, and use extension ladders.
3. Properly inspect scaffolding.

Materials and Equipment

- Multimedia projector and screen
- Computer
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- Calculators
- Tape measures
- Appropriate personal protective equipment, including personal fall arrest system
- Stepladder
- Platform ladder
- Straight ladder
- Extension ladder
- Assembled examples of tubular buck, pole, locking ring, and tube and clamp scaffolds and components
- Company safety manual with procedures for fall protection and rescue after a fall
- Scaffolding tags
- OSHA requirements for scaffolds: 29 CFR 1926.450, Subpart L Scaffolds and 29 CFR 1926.1431, Hoisting Personnel
- Safety training video (optional)
- Module Examinations*
- Performance Profile Sheets*

* Single-module AIG purchases include the printed exam and performance task sheet. If you have purchased the perfect-bound version of this title, download these materials from the IRC using your access code.
Safety Considerations

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites or utility areas. Ensure that they are briefed on site safety procedures.

This module requires trainees to use ladders and scaffolding. Review fall hazards and personal fall arrest systems as well as safety guidelines associated with using ladders and scaffolds in the maritime environment. Emphasize the importance of proper housekeeping.

Additional Resources

This module presents thorough resources for task training. The following resource material is suggested for further study.


Teaching Time for This Module

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. Approximately 12.5 hours are suggested to cover *Ladders and Scaffolds*. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. A majority of sessions will be spent in laboratories. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Planned Time</th>
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<tbody>
<tr>
<td>Sessions I and II. Introduction; Ladders</td>
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<tr>
<td>A. Introduction</td>
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<td>B. Ladders</td>
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<tr>
<td>1. Portable Ladders</td>
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<td>2. Permanent Ladders</td>
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<td>C. Laboratory</td>
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<tr>
<td>Have Trainees practice properly selecting, inspecting, and using stepladders and extension ladders. This laboratory corresponds to Performance Tasks 1 and 2.</td>
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<tr>
<td>Sessions III and IV. Scaffolding; Personnel Lifts; Rescue After a Fall</td>
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<tr>
<td>A. Scaffolding</td>
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<tr>
<td>1. Using and Caring for Tubular Buck Scaffolds</td>
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<td>2. Using and Caring for Pole Scaffolds</td>
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<td>3. Rolling Scaffolds</td>
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<td>4. Scaffolding Hazards</td>
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<td>5. Scaffolding Safety Guidelines</td>
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<td>B. Personnel Lifts</td>
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<td>C. Rescue After a Fall</td>
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<td>D. Laboratory</td>
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<tr>
<td>Have trainees practice properly inspecting scaffolding. This laboratory corresponds to Performance Task 3.</td>
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</table>
Session V. Review and Testing

A. Review

B. Module Examination
   1. Trainees must score 70 percent or higher to receive recognition from NCCER.
   2. Record the testing results on Training Report Form 200, and submit the
      results to the Training Program Sponsor.

C. Performance Testing
   1. Trainees must perform each task to the satisfaction of the instructor to receive
      recognition from NCCER. If applicable, proficiency noted during laboratory
      exercises can be used to satisfy the Performance Testing requirements.
   2. Record the testing results on Training Report Form 200, and submit the results
      to the Training Program Sponsor.