

## **MODULE OVERVIEW**

The ability to communicate effectively is essential to the safe operation of a crane. This module covers the fundamentals of the communication process. It addresses abstractions, fear, lack of common experience, and environmental factors. Verbal and nonverbal methods of communication are covered. This module also takes an in-depth look at the *ASME B30.5* hand signals, including the appropriate operator action when the signal is given and the expected machine movement.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed Core Curriculum and Mobile Crane Operations Level One.

## **OBJECTIVES**

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

1. Identify the signal person on a job site.
2. Communicate effectively at the job site with management, the crew, and the signal person.
3. Demonstrate the standard hand signals as specified in *ASME B30.5*.
4. Describe the communication dynamics involved in conducting multiple-crane lifts.
5. Describe the signaling procedure used when crane operations require more than one signal person.
6. Identify the various methods of communication on the job.
7. Demonstrate communication procedures using a handheld radio.

## **PERFORMANCE TASKS**

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

1. Demonstrate the proper use of hand signals as specified by *ASME B30.5*.
2. Direct an operator to move and place a load using the appropriate hand signals.
3. Demonstrate communication procedures using a handheld radio.

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen	Various radios and walkie-talkies
Transparencies	Handheld radios
Whiteboard/chalkboard	Mobile crane or simulator
Markers/chalk	<i>ASME B30.5 Consensus Standard</i>
Blank acetate sheets	Copies of the Quick Quiz*
Transparency pens	Module Examinations**
Pencils and scratch paper	Performance Profile Sheets**
Appropriate personal protective equipment	

\* Located at the back of this module.

\*\* Located in the Test Booklet.

## **SAFETY CONSIDERATIONS**

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize basic site safety.

## 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 10 hours are suggested to cover *Communication*. 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.

Topic	Planned Time
<b>Session I. Introduction to Communication</b>	
A. Introduction	_____
B. Communication Process	_____
C. Effective Communication	_____
D. Verbal Modes of Communication	_____
E. Laboratory – Trainees practice correct communication procedures for using a handheld radio. This laboratory corresponds to Performance Task 3.	_____
<b>Session II. Signals I</b>	
A. Nonverbal Modes of Communication	_____
B. Hand Signals	_____
C. Laboratory – Trainees practice the proper use of hand signals as specified by ASME B30.5. This laboratory corresponds to Performance Task 1.	_____
<b>Session III. Signals II</b>	
A. Multiple Cranes Lifting Operations	_____
B. Multiple Signal Persons	_____
C. Laboratory – Trainees practice directing an operator to move and place a load using the appropriate hand signals. This laboratory corresponds to Performance Task 2.	_____
<b>Session IV. Review, Module Examination, and Performance Testing</b>	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Craft 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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

## **MODULE OVERVIEW**

This module covers the various power systems that enable a crane to perform its work. Diesel and gasoline engines and the electrical motor-generator are discussed, as well as the mechanical, electrical, pneumatic and hydraulic power systems.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed Core Curriculum; Mobile Crane Operations Level One; and Mobile Crane Operations Level Two, Module 21201-04.

## **OBJECTIVES**

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

1. Describe the various types of power sources used on mobile cranes.
2. Identify the major components used in mobile crane power systems, including the mechanical, electrical, pneumatic, and hydraulic power systems.
3. Identify the major power flow systems associated with transmitting power through mobile cranes.

## **PERFORMANCE TASKS**

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

1. Identify the main power source of a crane.
2. Identify the cooling system and its components.
3. Identify the mechanical linkages for operator controls.
4. Identify the mechanical power coupling used between the power source and the crane's systems.
5. Identify all mechanical gearing systems.
6. Identify the controls and systems affected by the pneumatic system.
7. Locate selected components of a power drive system, including the following:
  - Battery/batteries
  - Oil filter(s)
  - Air filter(s)
  - Mechanical braking systems
  - Torque converter
  - Drive axles
  - Hydraulic actuators
  - Hydraulic braking systems
  - Steering system

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen

Transparencies

Whiteboard/chalkboard

Markers/chalk

Blank acetate sheets

Transparency pens

Pencils and scratch paper

Appropriate personal protective equipment

Mobile crane access

Copies of crane service technician's manual

Copies of the Quick Quiz\*

Module Examinations\*\*

Performance Profile Sheets\*\*

\* Located at the back of this module.

\*\*Located in the Test Booklet.

## SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize gasoline-powered engine, electrical, hydraulic, and pneumatic equipment safety.

## 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 27½ hours are suggested to cover *Machine Power Flow*. 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.

Topic	Planned Time
<b>Session I–IV. Introduction and Power Sources</b>	
A. Introduction	_____
B. Diesel Engines	_____
1. Fuel Systems	_____
2. Cooling and Electrical Systems	_____
3. Lubrication and Air Filtration Systems	_____
C. Gasoline/Propane Engines	_____
D. Electrical Motor-Generators	_____
E. Laboratory – Trainees practice identifying the main power source of a crane and the cooling system and its components. This laboratory corresponds to Performance Tasks 1 and 2.	_____
<b>Session V and VI. Mechanical Power Flow</b>	
A. Mechanical Clutches	_____
B. Mechanical Control Linkages	_____
C. Mechanical Power Transfer	_____
D. Mechanical Steering	_____
E. Mechanical Braking	_____
F. Laboratory – Trainees practice identifying the mechanical linkages for operator controls, the mechanical power coupling used between the power source and the crane’s systems, and all mechanical gearing systems. This laboratory corresponds to Performance Tasks 3, 4, and 5.	_____
<b>Session VII and VIII. Hydraulic Power Flow</b>	
A. Hydraulic Fundamentals	_____
B. Hydraulic Brakes and Clutches	_____
C. Hydraulic Power Couplers	_____
D. Hydraulic Pumps and Actuators	_____
E. Hydraulic Controls and Steering	_____
F. Laboratory – Trainees practice locating selected components of the power drive system. This laboratory corresponds to Performance Task 7.	_____
<b>Session IX and X. Electrical and Pneumatic Power Flow</b>	
A. Electrical Systems	_____
B. Pneumatic Systems	_____
C. Laboratory – Trainees practice identifying the pneumatic controls and systems. This laboratory corresponds to Performance Task 6.	_____

**Session XI. Review, Module Examination, and Performance Testing**

A. Review

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B. Module Examination

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

C. Performance Testing

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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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.



## **MODULE OVERVIEW**

This module covers preventive maintenance and compliance inspections on a crane. The trainee will gain an understanding of the safety considerations, procedures, and equipment/materials required of these inspections.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed Core Curriculum; Mobile Crane Operations Level One; and Mobile Crane Operations Level Two, Modules 21201-04 and 21202-04.

## **OBJECTIVES**

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

1. Define the responsibilities of the operator in the preventive maintenance program.
2. Perform various preventive maintenance functions.
3. Define the safety requirements that apply when checking various fluid levels.
4. Identify the differences between preventive maintenance inspections and compliance inspections.
5. Identify the different types of compliance inspections and their requirements.
6. Perform a daily pre-startup inspection.
7. Identify the requirements for frequent and periodic inspections.

## **PERFORMANCE TASKS**

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

1. Demonstrate the proper use of a grease gun.
2. Identify the lubrication points on a crane.
3. Demonstrate the proper technique for changing the oil and replacing the oil filter.
4. Perform a daily inspection of a crane.

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen

Transparencies

Whiteboard/chalkboard

Markers/chalk

Blank acetate sheets

Transparency pens

Pencils and scratch paper

Appropriate personal protective equipment

Crane manufacturer's service manual

Mobile crane access

Large oil collection container

Tools and materials for changing the oil and oil filter

Grease gun

Grease

Copies of the Quick Quiz\*

Module Examinations\*\*

Performance Profile Sheets\*\*

\* Located at the back of this module.

\*\*Located in the Test Booklet.

## **SAFETY CONSIDERATIONS**

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Emphasize gasoline-powered engine, electrical, hydraulic, and pneumatic equipment safety.

## 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 22½ hours are suggested to cover *Preventive Maintenance*. 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.

Topic	Planned Time
<b>Sessions I–IV. Introduction and Servicing the Equipment</b>	
A. Introduction	_____
B. Servicing the Equipment	_____
1. Battery	_____
2. Oil and Lubrication	_____
3. Air Cleaners	_____
4. Cooling Systems	_____
5. Hydraulic Systems	_____
C. Laboratory – Trainees practice the proper use of a grease gun, identifying the lubrication points on a crane, and the proper technique for replacing the oil filter. This laboratory corresponds to Performance Tasks 1, 2, and 3.	_____
<b>Sessions V–VII. Preventive Maintenance Inspections</b>	
A. Service Meter Readings	_____
B. Daily Preventive Maintenance Inspections	_____
C. Monthly Preventive Maintenance Inspections	_____
D. Annual Preventive Maintenance Inspections	_____
E. Laboratory – Trainees practice performing a daily inspection of a crane. This laboratory corresponds to Performance Task 4.	_____
<b>Session VIII. Compliance Inspections</b>	
A. Initial Inspections	_____
B. Regular Inspections	_____
C. Inspection Records	_____
<b>Session IX. Review, Module Examination, and Performance Testing</b>	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Craft 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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

## **MODULE OVERVIEW**

This module covers the components of wire rope, wire rope inspection, load block inspection, sheave inspection, proper installation of wire rope, maintenance guidelines, and end terminations and preparations.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed Core Curriculum; Mobile Crane Operations Level One; and Mobile Crane Operations Level Two, Modules 21201-04 through 21203-04.

## **OBJECTIVES**

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

1. Describe how wire rope is constructed and secured and how its breaking strength is determined.
2. Determine the allowable working load of wire rope.
3. Perform a wire rope inspection.
4. Identify wire rope replacement criteria and describe procedures for replacement.
5. Describe the proper maintenance procedures for wire rope.
6. Describe proper procedures and methods of reeving all wire ropes and multiple-part lines.
7. Describe the advantages of using multi-part reeving.

## **PERFORMANCE TASKS**

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

1. Install a conventional wedge socket.
2. Inspect various wire ropes using the appropriate wire rope inspection criteria.
3. Inspect a sheave and load block using the appropriate inspection criteria.
4. Inspect the safety latch on a load block and ball.
5. Reeve multiple-part wire rope to a load block.

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen	Sheave
Transparencies	Safety latches
Whiteboard/chalkboard	Ball
Markers/chalk	Manufacturer's literature on wedge sockets
Blank acetate sheets	Copies of the <i>Wire Rope Technical Board Manual</i>
Transparency pens	Wedge socket assemblies
Pencils and scratch paper	U-bolt and fist grip clips
Appropriate personal protective equipment	Wire rope with deformations:
Wire rope:	birdcaging
right and left regular	fatigue breaks
lang	kinking
alternate lay	Load block
Wire rope with various strand patterns	Copies of the Quick Quiz*
Wire rope with tapered end and seizing	Module Examinations**
Wire rope with various end fittings	Performance Profile Sheets**

\* Located at the back of this module.

\*\* Located in the Test Booklet.

## **SAFETY CONSIDERATIONS**

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly.

## **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 25 hours are suggested to cover *Wire Rope*. 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.

<b>Topic</b>	<b>Planned Time</b>
<b>Sessions I–III. Introduction and Wire Rope Construction</b>	
A. Introduction	_____
B. Wire Rope Construction	_____
1. Composition	_____
2. Component Configuration	_____
3. Identification	_____
4. End Terminations	_____
C. Laboratory – Trainees practice installing a conventional wedge socket. This laboratory corresponds to Performance Task 1.	_____
<b>Session IV and V. Wire Rope Inspection</b>	
A. Wire Rope Inspection Guidelines	_____
B. Wire Rope Inspection Criteria	_____
C. Laboratory – Trainees practice performing a wire rope inspection. This laboratory corresponds to Performance Task 2.	_____
<b>Session VI and VII. Sheave and Load Block Inspection</b>	
A. Sheave and Load Block Inspection	_____
B. D/d Ratio	_____
C. Maintenance Guidelines	_____
D. Laboratory – Trainees practice inspecting a sheave and load block, and inspecting the safety latch on a load block and ball. This laboratory corresponds to Performance Tasks 3 and 4.	_____
<b>Sessions VIII and IX. Reeving</b>	
A. Wire Rope Reeving	_____
1. Determining Parts of Line	_____
2. Block Twisting	_____
B. Reeving a Drum	_____
C. Laboratory – Trainees practice reeving multiple-part wire rope to a load block. This laboratory corresponds to Performance Task 5.	_____
<b>Session X. Review, Module Examination, and Performance Testing</b>	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

### C. Performance Testing

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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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.



## **MODULE OVERVIEW**

This module covers load moment indicators, anti-two-block devices, load indicators, and other operator aids that are installed in cranes. It takes an in-depth look at the input devices associated with these operator aids and the information they provide.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed Core Curriculum; Mobile Crane Operations Level One; and Mobile Crane Operations Level Two, Modules 21201-04 through 21204-04.

## **OBJECTIVES**

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

1. Define the purpose of a load indicator (LI) and a load moment indicator (LMI).
2. Identify the inputs for an LMI.
3. Describe the input devices for an LI, LMI, and anti-two-block (ATB) device.
4. Recognize the conditions that activate various alarms on an LMI and ATB.
5. Identify the conditions that affect various crane controls.
6. Predict which crane controls will be affected by various out-of-specification conditions on the LMI.
7. Interpret signals received through various operator aids.
8. Describe various operator aids not associated with an LI, LMI, or ATB.

## **PERFORMANCE TASKS**

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

1. Test a two-block warning/prevention device.
2. Program an LMI for various crane configurations.
3. Clear an alarm condition on LMIs and/or ATBs.
4. Identify selected sensors and operator aids.

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen	Scientific calculators
Transparencies	Two-block warning device or simulator
Whiteboard/chalkboard	Load moment indicator or simulator
Markers/chalk	Mobile crane cab or simulator
Blank acetate sheets	Copies of the Quick Quiz*
Transparency pens	Module Examinations**
Pencils and scratch paper	Performance Profile Sheets**
Appropriate personal protective equipment	

\* Located at the back of this module.

\*\*Located in the Test Booklet.

## **SAFETY CONSIDERATIONS**

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly.

## 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 20 hours are suggested to cover *Computer Aids/Operator Aids*. 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.

Topic	Planned Time
<b>Sessions I–III. Introduction and Load Moment Indicator</b>	
A. Introduction	_____
B. Load Moment Indicator	_____
1. Boom Length Sensor	_____
2. Boom Angle Sensor and Jib Angle Sensor	_____
3. Load Weight Sensor	_____
4. Load Radius and Boom Tip Height	_____
5. Superstructure Angle/Level Sensor and Outrigger Position Sensor	_____
6. Anemometer and Counterweight Sensor	_____
C. Laboratory – Trainees practice programming a load moment indicator for various crane configurations and clearing an alarm condition. This laboratory corresponds to Performance Tasks 2 and 3.	_____
<b>Sessions IV and V. Other Operator Aids I</b>	
A. Two-Blocking Warning System	_____
B. Two-Blocking Damage Prevention Systems	_____
C. Laboratory – Trainees practice testing a two-block warning/prevention device and clearing the alarm. This laboratory corresponds to Performance Tasks 1 and 3.	_____
D. Selected Controls Lockout System	_____
E. Load Indicator	_____
<b>Sessions VI and VII. Other Operator Aids II</b>	
A. Hoist Drum Rotation Indicator	_____
B. Throttle Lock	_____
C. Automatic Engine Speed Control	_____
D. Advanced Controls	_____
E. Laboratory – Trainees practice identifying selected sensors and operator aids. This laboratory corresponds to Performance Task 4.	_____
<b>Session VIII. Review, Module Examination, and Performance Testing</b>	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Craft 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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

## **MODULE OVERVIEW**

This module covers leverage and stability, operational quadrants, submerged lifts, non-centered lifts and other factors that affect stability.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed Core Curriculum; Mobile Crane Operations Level One; and Mobile Crane Operations Level Two, Modules 21201-04 through 21205-04.

## **OBJECTIVES**

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

1. Describe the principles of mobile crane operations as they relate to leverage and center of gravity.
2. Identify a mobile crane's tipping axis as it relates to leverage and center of gravity.
3. Describe changes in a mobile crane's leverage relative to various boom operating quadrants.
4. Describe the effects of load radius on the rate of tipping.
5. Describe the effects of load movement on measured radius.
6. Define the effects of a submerged lift on crane capacity.

## **PERFORMANCE TASKS**

There are no performance tasks for this module.

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen

Transparencies

Whiteboard/chalkboard

Markers/chalk

Blank acetate sheets

Transparency pens

Pencils and scratch paper

Appropriate personal protective equipment

Model teeter-totter with sample loads

Model cranes

Fishing poles

Small swimming pool

Sample loads (brick and plywood)

Copies of the Quick Quiz\*

Module Examinations\*\*

\* Located at the back of this module.

\*\* Located in the Test Booklet.

## **SAFETY CONSIDERATIONS**

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly.

## 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 *Load Dynamics*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

Topic	Planned Time
<b>Sessions I–III. Introduction and Leverage</b>	
A. Introduction	_____
B. Rotational Forces or Moments	_____
C. Crane Stability	_____
1. Quadrants of Operation	_____
2. Centers of Gravity and Forward Stability	_____
3. Backward Stability	_____
4. Noncentered Lifts and the Effects on Load Radius	_____
5. Other Factors Affecting Stability	_____
<b>Sessions IV and V. Rate of Tipping and Submerged Lifts</b>	
A. Rate of Tipping	_____
B. Submerged Lifts	_____
<b>Session VI. Review and Examination</b>	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

## **MODULE OVERVIEW**

This module covers site hazards and restrictions that could hinder on-site crane movement safety considerations involved in crane movement over unlevel ground, pick-and-carry operations, and power-line contact. Flotation capacity is also addressed in this module.

## **PREREQUISITES**

Prior to training with this module, it is recommended that the trainee shall have successfully completed Core Curriculum; Mobile Crane Operations Level One; and Mobile Crane Operations Level Two, Modules 21201-04 through 21206-04.

## **OBJECTIVES**

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

1. Configure the crane for movement.
2. Travel with the boom over the front and rear.
3. Identify various site hazards and restrictions to on-site equipment movement.
4. Identify manufacturer's data and documentation.
5. Identify the safety considerations involved in movement preparation.
6. Travel the crane over unlevel ground, and identify the safety considerations involved in this travel.
7. Identify the safety considerations involved in a pick-and-carry operation.
8. Define flotation capacity.
9. Define the importance of proper tire pressure.

## **PERFORMANCE TASKS**

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

1. Survey the site for hazards and restrictions.
2. Configure and prepare the crane for movement.
3. Travel a predetermined course on route.
4. Perform turns while traveling.
5. Perform reverse motion in a predetermined location.

## **MATERIALS AND EQUIPMENT LIST**

Overhead projector and screen

Transparencies

Whiteboard/chalkboard

Markers/chalk

Blank acetate sheets

Transparency pens

Pencils and scratch paper

Appropriate personal protective equipment

Access to various types of mobile cranes

Manufacturer's documentation

Marker cones

Module Examinations\*

Performance Profile Sheets\*

\*Located in the Test Booklet.

## **SAFETY CONSIDERATIONS**

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Remind trainees of precautions associated with on-site crane movement.

## 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 25 hours are suggested to cover *On-Site Equipment Movement*. 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.

Topic	Planned Time
<b>Sessions I–V. Introduction and Movement Preparations and Safety</b>	
A. Introduction	_____
B. Movement Preparation	_____
B. Safety Considerations in Movement Preparation	_____
1. Site Hazards and Restrictions	_____
2. Manufacturer’s Requirements and Restrictions	_____
C. Laboratory – Trainees practice surveying the site for hazards and configuring and preparing the crane for movement. This laboratory corresponds to Performance Tasks 1 and 2.	_____
<b>Session VI–IX. Types of Crane Movement</b>	
A. Types of Crane Movement	_____
1. Rough-Terrain/All-Terrain Type Cranes	_____
2. Crawler-Type Cranes	_____
3. Truck-Mounted Cranes	_____
B. Flotation Capacity	_____
C. Tires	_____
D. Travel	_____
1. Over Unlevel Ground	_____
2. With a Suspended Load	_____
E. Laboratory – Trainees practice travel a predetermined course on route, perform turns while traveling, and perform reverse motion in a predetermined location. This laboratory corresponds to Performance Tasks 3, 4, and 5.	_____
<b>Session X. Review, Examination, and Performance Testing</b>	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70% or higher to receive recognition from NCCER.	
2. Record the testing results on Craft 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 Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	