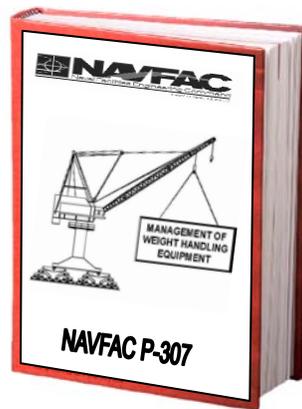




# Navy Crane Center



# NAVFAC P-307 Training

**CERTIFYING OFFICIAL**

**WEB BASED TRAINING STUDENT GUIDE**

**NCC-CO-01**

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## INTRODUCTION

### CERTIFYING OFFICIAL COURSE

Certifying Official is designed to acquaint new and prospective certifying officials with Navy requirements for certifying cranes and provide a knowledge base on which to build upon with on-the-job experience. Topics covered include NAVFAC P307 familiarization, responsibilities, test procedures, documentation, and accident identification and reporting. Prerequisite: None



### CERTIFYING OFFICIAL MODULES

Here is a list of the modules used in certifying official. Take time to explore the content for each of the modules.

### CERTIFYING OFFICIAL REFERENCE MATERIALS

The certifying official course uses references: a student reference package and the video reference library. These references are available from the courseware reference area. Use the Course Reference Button to view and print the Student Reference Package and view the video clips.

# NOTES

## NAVFAC P-307

### NAVFAC P-307 PURPOSE

The overall purpose of NAVFAC P-307 is to maintain the level of safety and reliability that was originally built into the equipment, ensure optimum service life, provide uniform standards for weight handling equipment operator licensing, and ensure safe weight handling operations. Weight Handling Equipment includes both cranes and the rigging gear used for lifting operations.

### NAVFAC P-307 APPLICABILITY

NAVFAC P-307 applies to naval shore activities, naval construction forces, including the Naval construction training centers, and naval special operating units.

NAVFAC P-307 meets, or exceeds, all OSHA regulations that apply to the operation of cranes.

### NAVFAC P-307 CONTENTS

For an overview of NAVFAC P-307, review this table of contents.

Section	Contents
1	General Overview
2	Maintenance
3	Certification
4	Crane Alterations
5	Equipment History File
6	Operator Licensing Program
7	Operator Qualification and Testing
8	Licensing Procedures and Documentation
9	Operator Checks
10	Operation Safety
11	Additional Requirements
12	Investigation and Reporting of Crane and Rigging Gear Accidents
13	Training and Qualification
14	Rigging Gear and Miscellaneous Equipment

### WEIGHT HANDLING REQUIREMENTS

NAVFAC P-307 provides requirements for Weight Handling Equipment including maintenance (repairs and alterations), inspection, test, certification, operations, training, licensing, and rigging gear use.

### WHE MAINTENANCE AND INSPECTION

NAVFAC P-307 also provides requirements for documentation

**CERTIFICATION POSTING**

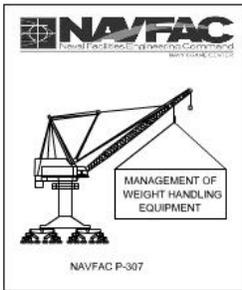
The crane identification number, certified capacity and certification expiration date must be posted on or near the crane. Posting a copy of the actual certification, crane test cards, stickers or signs, are all acceptable methods provided they include the required information.

**Certification**

CRANE NO	TYPE CRANE	TEST LOAD (lbs.)	TEST PROCEDURE
12345-7	OET	12,500	APPENDIX E
MAIN HOIST RATED CAPACITY	MAIN HOIST	AUX HOIST	WHP HOIST
	10,000 lbs	5,000 lbs	lbs
TYPE SERVICE AUTHORIZED	SPECIAL PURPOSE SERVICE OR GENERAL PURPOSE SERVICE		
GPS			
CERTIFICATION DATE	CERTIFICATION EXPIRES/RETEST DATE		
July 20xx	30 JUNE 20xx 1 YEAR		
SIGNATURE OF TEST DIRECTOR		DATE	Certification Includes: • Crane Number • Crane Capacity • Certification Expiration Date
John Q. Tester		1 July	
OPERATOR AND LICENSE NUMBER			
Pat Operator		#123456	

Crane Testing Information Card can be used to display crane certification information.

All cranes require certification in accordance with NAVFAC P-307



**NAVFAC P-307 COVERED EQUIPMENT**

NAVFAC P-307 covers category 1, 2, 3, and 4 cranes, as well as rigging gear. Detailed descriptions of the cranes are included in Section 1. Illustrations of individual crane types can be found in Appendix B. Rigging gear is covered in Section 14.

**NAVFAC P-307 OVERVIEW SECTION 1**

Section 1 describes cranes and crane-related equipment and lists types of cranes and related equipment used at Naval Shore activities by category.

**CATEGORY 1 CRANES**

This is a list of category 1 cranes. All category 1 cranes require a license to operate.

CERTIFYING OFFICIAL STUDENT GUIDE

CATEGORY 1 CRANES

These are examples of Category 1 cranes.



### MOBILE BOAT HOIST

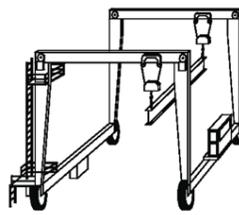
The mobile boat hoist consists of a steel structure of rectangular box sections, supported by four sets of dual wheels capable of straddling and carrying boats.

The landing craft retrieval unit is a type of mobile boat hoist with self propelled or towed carriers consisting of a wheeled steel structure capable of straddling and carrying boats.

### RUBBER TIRE GANTRY

The rubber tire gantry crane shown is a Cat 1 crane as described in NAVFAC P-307.

Rubber Tire Gantry Crane



- Portable elevated bridge crane or hoist(s) mounted on legs
- Legs mounted on rubber tires
- May be self-propelled or towed

### CATEGORY 2 AND 3 CRANES

This is a list of Category 2 and Category 3 cranes. Portable manual and powered hoists are covered in Section 14 of the NAVFAC P-307. The activity may, however, treat them as Category 2 or 3 cranes.

### CATEGORY 2 AND 3 CRANES CAPACITY

The certified capacity of these cranes determines the category. Category 2 cranes have a certified capacity of 20,000 lbs. and greater. Category 3 cranes are those with a certified capacity of less than 20,000 lbs.

**CATEGORY 2 AND CATEGORY 3 CRANES**

These are examples of Category 2 and Category 3 Cranes.



**CATEGORY 4 CRANES**

All Category 4 cranes require a licensed operator.

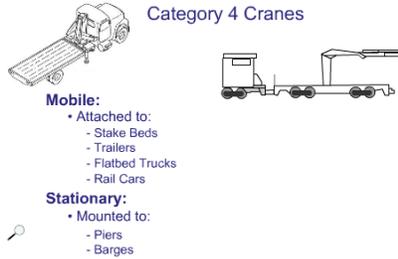
Category 4 Cranes



### CATEGORY 4 CRANES – MOUNTING

Category 4 cranes may be attached to stake beds, trailers, flat bed trucks, rail cars, or may be stationary mounted on piers, barges, etc.

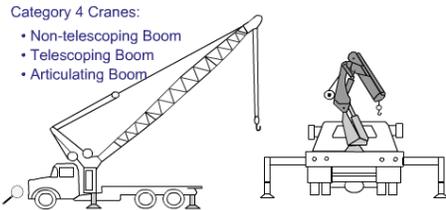
#### Mounts



### CATEGORY 4 CRANES – BOOMS

Category 4 Cranes may have a non-telescoping, telescoping, or articulating boom.

#### Category 4 Booms



### PEDESTAL MOUNTED - CAPACITY

Pedestal mounted commercial boom assembly cranes of with less than 2,000 lbs. capacity are considered Category 3 cranes. Capacities greater than 2,000 lbs. are Category 4 cranes and require a licensed operator.

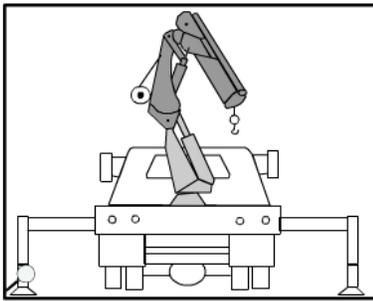
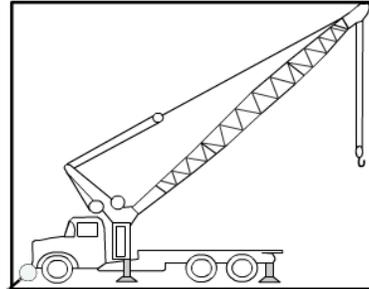


### CATEGORY 4 CRANES - SPECIAL CONSIDERATIONS

Commercial truck mounted cranes [described in ASME B30.5] and articulating boom cranes [described in ASME B30.22] of all capacities are Category 4 cranes and require a licensed operator - even if the crane is down rated for administrative purposes.

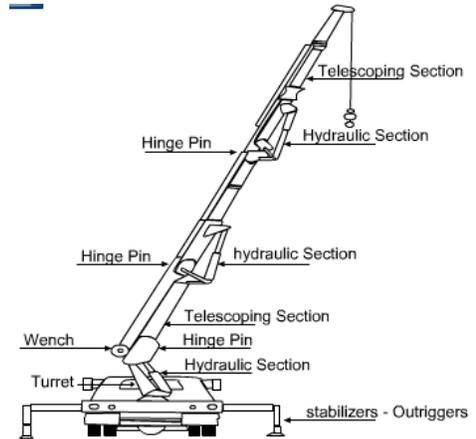
**CATEGORY 4 CRANES - EXAMPLES**

These are examples of Category 4 cranes.



### CATEGORY 4 CRANES – COMPONENTS

Using your mouse, explore these Category 4 crane components.



### P-307 SECTION 7 OPERATOR QUALIFICATION AND TESTING

NAVFAC P-307 provides uniform standards for weight handling operator licensing.



### CRANE ACCIDENTS

In the event of an accident, activities shall investigate and report the accident in accordance with NAVFAC P-307 Section 12, as well as OPNAV Instructions 5102.1. Crane and Rigging Gear Accident definitions can be found in Section 12.

### P-307 TRAINING

Personnel training requirements are found in section 13 of NAVFAC P-307.

### P-307 SECTION 14 - RIGGING GEAR

Section 14 of NAVFAC P-307 provides maintenance, inspection, and test requirements for rigging gear and miscellaneous equipment not covered in sections 2 through 11.



# NOTES

NAVFAC P-307 MODULE EXAM

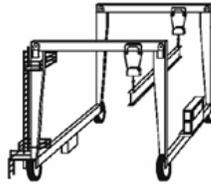
Online exam questions may appear in a different order than those listed below.

1. The purpose of NAVFAC P-307 is to:

- A. maintain safety & reliability
- B. ensure optimum service life
- C. provide standards for crane operations and rigging
- D. ensure safe crane and rigging operations
- E. ensure all of the above

2. What is the category of this crane?

- A. category 1
- B. category 2
- C. category 3
- D. category 4



3. NAVFAC P-307 provides guidance to shore based Navy activities for management of weight handling equipment.

- A. True
- B. False

4. What is the category of this crane?

- A. category 1
- B. category 2
- C. category 3
- D. category 4



Capacity: Less than 20,000 lbs.

5. What is the category of this crane?

- A: category 1
- B. category 2
- C. category 3
- D. category 4



6. What is the category of this crane?

- A: category 1
- B. category 2
- C. category 3
- D. category 4



Capacity: 20,000 lbs.

7. What is the category of this crane?

- A: category 1
- B: category 2
- C: category 3
- D: category 4



8. There is no difference in capacity between category 2 and category 3 cranes.

- A: True
- B: False

9. What is the category of this crane?

- A: category 1
- B: category 2
- C: category 3
- D: category 4





## CRANE COMPONENTS



### CRANE COMPONENTS

Careful repair and maintenance are essential to safe crane operations. To ensure repairs are not compromised by sub-standard parts, critical crane components are clearly identified. NAVFAC P-307, section F provides examples of load bearing parts, load controlling parts, and operational safety devices.

### LOAD-BEARING PARTS

Load-bearing parts support the load. Failure of a load-bearing part can cause dropping, uncontrolled shifting or uncontrolled movement of the load.



Examples of load-bearing parts are wire rope, sheaves, hooks, hook blocks, and hoist drum pawls. The next example screen shows a boom dog, used to prevent unwanted rotation of a boom or hoist drum.



### LOAD-BEARING PARTS - CARRIER FRAME STRUCTURES



The carrier frame provides a working base for the upper works of the crane. The tires, wheels, and axles support the carrier frame for transporting and for lifting loads on rubber. Outriggers, stabilizers, and locking devices provide support for on-outrigger operations.



Failure of any one of these components or systems can cause the load to drop or cause uncontrolled movement of the load. These are critical components that must be carefully checked before operations or testing.

### LOAD-BEARING PARTS - BRIDGE CRANE

Load-bearing parts found on bridge cranes include the bridge girders that carry the weight of the trolley including hoisting machinery and the load; and the wire rope drum and hoisting machinery that lifts and supports the load. Appendix F of NAVFAC P-307 provides examples of load-bearing parts.

### LOAD-CONTROLLING PARTS

Load-controlling parts are crane components that position, restrain, or control movement of the load. Malfunction of these parts can cause dropping, uncontrolled shifting, or movement of the load.



### LOAD CONTROLLING PARTS EXAMPLES 1

Examples of load-controlling components are foot-controlled brakes used as secondary brakes for hoist speed control, travel gear assemblies, rotate gear assemblies, and rotate locks. Appendix F of NAVFAC P-307 lists examples of load-controlling parts.



### LOAD-CONTROLLING PARTS - EXAMPLES 2

Some additional examples are electrical crane-control circuits related to rotate and travel including brakes and clutches. Crane-mounted diesel engines and generators and electrical-power-distribution systems must be treated as load controlling parts.



### SAFETY DEVICES

Safety devices are divided into two groups, general safety devices and operational safety devices. Operational safety devices affect the safe lifting and handling ability of the equipment. Operational safety devices are critical crane components. General safety devices provide protection for personnel and equipment on or in the crane operating path.

### OPERATIONAL SAFETY DEVICES – LOAD INDICATORS

Load-moment indicators are operational aids providing the crane operator necessary information to stay within the capacity of the crane. Load-moment indicators that provide shutdown capabilities are operational safety devices. They may provide the operator with load weight, boom angle, and boom length. As the operator approaches critical limits load moment devices may sound an audible alarm, illuminate warning lights, or lock out functions that could possibly allow the operator to overload the crane. If a load moment device has lockout capability, it must be treated as an operational safety device.

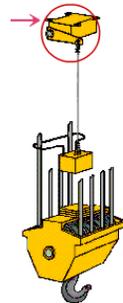


### BOOM ANGLE INDICATORS

Mechanical boom angle indicators are operational safety devices. These devices provide the operator with the boom angle needed to calculate the radius of the crane. Mechanical boom angle indicators are usually mounted on the boom where they can easily be read from the cab.

### OPERATIONAL SAFETY DEVICES – LIMIT SWITCHES

Limit switches are operational safety devices that prevent damage to the crane if a loss of control occurs. Most cranes are equipped with limit switches. These images are examples of weighted-type hoist upper-limit switches. A spring-loaded switch opens the circuit when the hook block raises the weight. Interruption of power to the hoist function stops the upward movement of the hoist block to prevent two-blocking.



### OPERATIONAL SAFETY DEVICES – OVER-SPEED

Over-speed, pressure, and temperature devices on crane-mounted engines are operational safety devices. When the engine provides the power to move loads, the devices provide shutdown ability to protect the engine from damage. Appendix F of the P-307 provides a comprehensive list of operational safety devices.



### SAFETY DEVICES – GENERAL

General safety devices are those devices that protect or alert the operator or personnel working in the vicinity of the crane. Some general safety devices used to warn personnel working on or around the crane are horns, bells, whistles, travel alarms, travel warning lights, and bumpers.



Horns, Bells, Whistles



Travel Alarms



Travel Warning Lights



Bumpers

# NOTES

CRANE COMPONENTS MODULE EXAM

*Online exam questions may appear in a different order than those listed below.*

1. Which of the following does not affect the safe operation of the crane?
  - A. load bearing parts
  - B. load controlling parts
  - C. operational safety devices
  - D. general safety devices
  
2. Safety devices that provide protection for personnel and equipment are considered \_\_\_\_\_ safety devices.
  - A. load bearing
  - B. general
  - C. operational
  - D. universal
  
3. Load \_\_\_\_\_ parts are those that support the load.
  - A. handling
  - B. controlling
  - C. bearing
  - D. operational
  - E. lifting
  
4. A horn is what type of component?
  - A. operation safety device
  - B. load controlling part
  - C. load bearing part
  - D. general safety device
  
5. Load \_\_\_\_\_ parts are those that restrain, position or control the movement of the load.
  - A. controlling
  - B. operation
  - C. lifting
  - D. handling
  - E. bearing

6. Safety devices that affect the safe load lifting and handling capabilities of equipment are considered \_\_\_\_\_ safety devices.

- A. universal
- B. load bearing
- C. general
- D. operational

7. Travel gears are what type of components?

- A. operational safety devices
- B. general safety devices
- C. load controlling parts
- D. load bearing parts

8: A hook is what type of component?

- A. load bearing part
- B. load controlling parts
- C. general safety device
- D. operational safety device

9: A travel alarm is what type or group of components?

- A. general safety device
- B. operational safety device
- C. load bearing part
- D. load controlling part

10: Hydraulic foot brakes are what type or group of components?

- A. load bearing parts
- B. load controlling parts
- C. general safety device
- D. operational safety device

## **RESPONSIBILITIES**

### **THE CERTIFYING OFFICIAL CANDIDATE**

An activity's certifying official should have a fundamental knowledge of cranes and the use of weight handling equipment. Decisions regarding cranes must be based on safety. Decisions made by the certifying official not only affect the overall condition of the crane, but the safety of personnel working in, with, and around cranes. The certifying official should not be pressured by production schedules. There should be a separation between the production organizations that need and use the cranes and the person who certifies the crane.



### **PRIMARY RESPONSIBILITY**

The certifying official's primary responsibility is to maintain the integrity of the crane certification program. In doing this, the Certifying Official ensures the activity's cranes are inspected and tested in accordance with NAVFAC P-307 and that the cranes are safe for their intended purpose. The activity's certifying official must ensure the safety and reliability of weight handling equipment by determining that repairs are properly performed and documented. He or she must verify that all required certification tests have been performed and the appropriate paperwork is complete and correct.



### **CERTIFYING OFFICIAL RESPONSIBILITIES**

The major responsibilities of the certifying official include certifying cranes, designating WHE personnel, ensuring third party certifications on long-shoring cranes, confirming, concurring and/or approving [as applicable] WHE procedures, work deferrals, certification and service cycle extensions, lift configurations, proper documentation, certification of work, and resolving any issues that may arise regarding the activity's weight handling equipment or program.

### **DESIGNATES WHE PERSONNEL**

One of the first responsibilities of the certifying official is to designate the personnel who will be involved in Weight Handling Equipment and crane operator certification. The certifying official must designate, in writing, the condition inspectors and test directors who are going to perform the inspections and load tests on the cranes. The certifying official may also be designated by the activity commanding officer as the licensing official and be responsible for designating performance examiners



for licensing crane operators. Before these personnel are designated, the certifying official must ensure that they are well qualified for the job and have had the required training for their positions. Chapter 13 of NAVFAC P-307 outlines the training required for each job.

### CRANE CERTIFICATION

A major responsibility of the certifying official is crane certification. The certifying official ensures all certifications, including third party certifications, are performed.



### CERTIFICATION OF CRANES

All applicable paperwork must be reviewed before certifying officials certify a crane. Certifying officials must make sure that all requirements for maintenance, inspection, and testing have been met before they sign the crane certification. After a complete review of the crane certification documentation, a certifying official signs the crane certification.

### RE-CERTIFIES CRANES

The certifying official plays an important part in the crane *re-certification* process. He or she must be aware of any repairs, adjustments, and / or alterations to any critical components that affect the crane's current certification. Certifying officials must understand the load test requirements after repairs, adjustments, and / or alterations have been made. Work documents must be signed by the certifying official when any repairs to critical components will NOT necessitate a load test. Certifying officials must understand other circumstances which affect crane certification, for example: overloads, accidents, and major deficiencies.



### THIRD PARTY CERTIFICATION

The Certifying Official must ensure that applicable cranes receive a third party certification by the Navy Crane Center. Cranes that require third-party certification are those used in cargo transfer and floating cranes used for ship building, ship repair, or ship breaking. Detailed information about third party certification can be found in NAVFAC P-307, Appendix M.



### APPROVAL AND CONCURRENCE

Certifying officials provide approval and concurrence to various evolutions involving crane maintenance and the certification process. In cases where the safe operation of the crane is not affected and engineering justification and evaluation has been obtained, the certifying official may defer work to critical components. Certifying officials may extend maintenance, servicing, or lubrication schedules when outages would conflict with work schedules and are responsible for providing concurrence with the activity Commanding Officer when extending the annual certification of the crane for emergent conditions. The extended certification shall not exceed 45 calendar days from the annual certification expiration date. Authority to extend a certification shall not be delegated and before extending the certification, the crane shall pass a complete condition inspection. Any authorization to extend a certification shall be filed in the crane's equipment history file.

### CRANE PROCEDURE APPROVAL

The certifying official is tasked with approving procedures for cranes. When cranes come with features or components not specifically covered by NAVFAC P-307, the certifying official will approve procedures developed by the activity engineering organization. The certifying official will approve procedures developed for controlled disassembly and reassembly of critical components before the procedures are sent to the Navy Crane Center for approval. Approval by the certifying official is also required on ancillary equipment procedures before the procedures are sent to the Navy Crane Center for approval. The certifying official approves reduced capacity ratings, test procedures, and test conditions for certifying barge-mounted mobile cranes, as well as wind and wave restrictions. More detailed information on these procedures may be found in NAVFAC P-307, section 3.



**OVER-THE-SIDE LIFTING**



The Certifying Official ensures that applicable crane set-ups and lift configurations are reviewed and approved. One example might be where the crane's load chart permits lifts over the side without the use of outriggers. In this case, the certifying official shall review the weights and capacities involved and approve the capacity. Capacity shall not exceed 60% of the OEM's load chart values or, if a stability test is performed in accordance with SAE J765, 50% of the balance point loads.

**BARGE-MOUNTED MOBILE CRANES**

In cases where it is necessary to install a mobile crane on a barge, the certifying official shall prescribe appropriate test conditions and precautions as outlined in NAVFAC P-307, Section 3.8.



**REPORTS ACCIDENTS**

Certifying officials are responsible for crane accident reporting. They must review and sign all crane accident reports.

CRANE AND RIGGING GEAR ACCIDENT REPORT					
Accident Category: <input type="checkbox"/> Crane Accident <input type="checkbox"/> Rigging Gear Accident					
From:			To: Navy Crane Center 10 Industrial Hwy MS 82 Lester, Pa 19113-2990 FAA (915) 889-9814		
BIC:		Activity:		Report No.:	
Crane No.:	Category:	Accident Date:	Time: hrs		
Category of Service: <input type="checkbox"/> SPA <input type="checkbox"/> CPA		Crane Type:	Crane Manufacturer:		
Location:		Weather:			
Crane Capacity:	Hook Capacity:	Weight of Load on Hook:		NATIVE ACTIONS TAKEN AS responsibility For equipment caused by the malfunction of	
<input type="checkbox"/> Full	<input type="checkbox"/> No	<input type="checkbox"/> Misc	<input type="checkbox"/> Only Cost Estimate		Code
Concurrents:			Code	Date	
			Code	Date	
Certifying Official (Crane Accidents Only):			Code	Date	

### ADDITIONAL RESOURCES

Navy Crane Center is always ready and willing to assist in solving your crane-related concerns. Resources available include the NAVCRANECEN website. This website contains crane-related information such as Crane Safety Advisories (CSA's) and Equipment Deficiency Memorandums (EDM's), Standing Crane Alterations, downloadable versions of various forms and manuals, including the latest version of NAVFAC P-307, training schedules, and the Crane Corner newsletter. The website also provides a comprehensive summary of audit findings and results from previous years. The In-Service Engineering Branch provides engineering resolutions for cranes already in service. Located in Portsmouth, Virginia, their services include evaluation of alteration requests and development of Crane Safety Advisories and Equipment Deficiency Memorandums. NCCR and audit team personnel are a good source of information about your equipment and can also provide points of contact for other activities with similar equipment. Stay in touch with your audit team throughout the year.

# NOTES

RESPONSIBILITIES MODULE EXAM

*Online exam questions may appear in a different order than those listed below.*

1. When cranes are equipped with features or components not specifically covered by NAVFAC P-307, the certifying official will \_\_\_\_\_.

- A. approve applicable procedures developed by the activity engineering organization
- B. turn the procedure development process over to one of NCC audit teams
- C. turn the procedure development process over to the load test director and load test team

2. While the certifying official may extend maintenance, servicing, or lubrication schedules, the extended certification shall not exceed:

- A. 45 calendar days from the annual certification expiration date
- B. 120 calendar days from the annual certification expiration date
- C. 30 days from the annual certification expiration date

3. A certifying official must make crane decisions based on \_\_\_\_\_.

- A. work orders
- B. production schedules
- C. safety

4. In case of a crane or rigging gear accident, the certifying official is responsible for \_\_\_\_\_.

- A. reporting crane accident
- B. reviewing accident reports
- C. signing accident reports
- E. all of the listed actions

5. Before certifying a crane, the certifying official must make sure all requirements have been met for \_\_\_\_\_.

- A. testing
- B. all of the listed actions
- C. documentation
- D. maintenance
- E. inspection

6. Decisions made by the certifying official \_\_\_\_\_.

- A. provides guidance for the NCC audit teams
- B. first and foremost adhere to the production and testing schedule
- C. affect the safety of personnel working in, with, and around cranes.
- D. guide revisions for NAVFAC P-307

## CERTIFYING OFFICIAL STUDENT GUIDE

7. The certifying official's primary responsibility is to maintain the integrity of the crane certification program by \_\_\_\_\_.
- A. verifying required certification tests have been performed
  - B. verifying all appropriate documentation is complete and correct
  - C. ensuring the safety and reliability of weight handling equipment
  - D. performing all listed actions
8. A certifying official must \_\_\_\_\_.
- A. not be pressured by production schedules
  - B. ensure all production schedules are met
9. Before ancillary equipment procedures are sent to the Navy Crane Center for approval they must be approved by the \_\_\_\_\_.
- A. all personnel listed
  - B. certifying official
  - C. load test director
  - D. commanding officer
10. In cases where it is necessary to install a mobile crane on a barge, the certifying official shall \_\_\_\_\_.
- A. contact NCC for appropriate procedures
  - B. provide an interim certification until permanent certification can be granted
  - C. prescribe appropriate test conditions and precautions as outlined in NAVFAC P-307
11. The certifying official must ensure that third party certification has been provided by Navy Crane Center for:
- A. cranes owned and operated by contractors
  - B. cranes used in cargo transfer
  - C. all floating cranes
12. The certifying official designates in writing:
- A. all personnel listed
  - B. crane operator performance examiners
  - C. condition inspectors
  - D. none of the personnel listed – they are designated by the commanding officer
  - E. load test directors

CERTIFYING OFFICIAL STUDENT GUIDE

13. The certifying official is responsible for \_\_\_\_\_.

- A. re-certification
- B. only for crane certification
- C. crane certification
- D. third-party certification
- E. all of the certifications listed



**DOCUMENTATION REVIEW**

**CERTIFICATION REVIEW**

The annual crane certification process requires that the certifying official review the following documents: the Maintenance Inspection Specification and Record, the Crane Condition Inspection and Record, and the Certification of Load Test and Condition Inspection. In addition to these documents, Shop Repair Orders, referred to by the acronym SRO's, or other work authorizing documents for work performed, may be reviewed at the discretion of the certifying official.

CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION	
Activity: Crane No. Type    OEM's Rated Capacity Main _____ Dc. _____ Test Aux _____ Dc. _____ Test Wip _____ Dc. _____ Test <input type="checkbox"/> Annual Certification <input type="checkbox"/> Biennial Load Test <input type="checkbox"/> Biennial Certification <input type="checkbox"/> Within Recertification (Reason) _____	<b>Certification</b> This is to certify that inspections and tests have been conducted in accordance with the procedures set forth in the current NAVFAC P-307. It is further certified that the crane identified above is satisfactory to lift its Test Director (Signature) _____ Date _____ Inspector (Signature) _____ Date _____ Inspector (Signature) _____ Date _____ <b>Certifying Official (Signature)</b> _____ Date _____ Expiration Date _____
Category 1 or 4 Cranes: _____	Maximum Payload: _____

**MAINTENANCE INSPECTION SPECIFICATION AND RECORD (MISR)**

The Maintenance Inspection Specification and Record (MISR) is used for category 1 and category 4 cranes. This document is found in Appendix C of the NAVFAC P-307 manual. It is referred to by the acronym MISR. When using the MISR for category 4 cranes, only applicable portions of Appendix C are used as needed and as recommended by the OEM. For category 2 and category 3 cranes, the Annual

Maintenance Inspection Specification and Record is found in Appendix D of the NAVFAC P-307 manual. It is referred to by the acronym as an AMISR; the "A" standing for annual. When reviewing this form, the certifying official must verify that the information blocks, at the top of each sheet, are filled in with the correct information, and that all inspection blocks are marked either satisfactory (S), unsatisfactory (U), corrected (C), or not applicable (N/A). If an inspection block is

MAINTENANCE INSPECTION SPECIFICATION AND RECORD				
CATEGORY 1 CRANES				
SHEET 1 OF 1				
Crane	Type	Manufacturer	Capacity	
Prior Inspection DATE	Current Inspection DATE	Legend: Check under condition		
		S = Satisfactory U = Unsatisfactory	C= Corrected (If deferred, leave blank and identify on Unsatisfactory Items sheet) NA = Not Applicable	
Item No.	Inspection Type	Items to be Inspected	Maintenance Inspection Specified	System Inspected
1	A			
ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES				
SHEET 1 OF 1				
Crane	Type	Manufacturer	Capacity	
Prior Inspection DATE	Current Inspection DATE	Legend: Check under condition		
		S = Satisfactory U = Unsatisfactory	C= Corrected (If deferred, leave blank and identify on Unsatisfactory Items sheet) NA = Not Applicable	
Item No.	Items to be Inspected	Maintenance Inspection Specification	System Inspected	Condition
1	Structure (Bridge Girders, etc.)	Inspect structural components for damage, etc.	S U C NA	

marked "U", verify, that it is also marked "C" showing that it has been corrected. Or, if not corrected, verify that the item is identified as deferred on the Unsatisfactory Items page of the MISR.

**MISR SYSTEMS INSPECTED BLOCK**

In cases where the attribute is one that applies to different systems on the crane, each system must be identified and the results recorded on the form. As shown on this example, there are three different sets of clutches listed on the form in the systems-inspected column: a rotate clutch, a hoist clutch, and a boom clutch. Each system that applies has been written in, and each must be marked with an “X” in the appropriate block.

Item No.	Inspection Type			Items to be Inspected	Maintenance Inspection Specification	System Inspected	Condition				
	A	B	C				S	U	C	NA	
23	X	X	X	Clutches (Boom, Hoist, Swing, and Travel)	Inspect clutch linkage for damage, for evidence of binding and loose or worn components, and for proper lubrication and adjustment. Inspect clutch linings for wear, debonding, and glazing, and drums for smoothness and for evidence of overheating. During operation, inspect for slippage and evidence of binding. Listen for abnormal noise.	HOIST	X				
						BOOM	X				
						ROTATE	X				

**MISR UNSATISFACTORY ITEMS SHEET**

If an item is marked unsatisfactory on the MISR form it must be listed on the Unsatisfactory Items sheet in NAVFAC P-307 appendix C. The certifying official should ask the following questions to evaluate the completeness of the document: Is there an adequate description of the unsatisfactory item? Is the repair SRO number listed? Is the Verification of Correction column signed and dated for each item? If the item is being deferred, is the SRO block marked with a D? Deferred work to load bearing, load

controlling and operational safety devices requires approval by the certifying official with engineering justification. NAVFAC P-307, Section 2, Maintenance: *Deferral of Work During Annual Inspections/Certifications* outlines the procedure and actions to be taken. The deferral must be in writing and limited for a period up to the next certification.

MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 CRANES UNSATISFACTORY ITEMS			
SHEET <u>1</u> OF <u>1</u>			
Crane 82-00051			
NOTE: DESCRIBE ITEMS FOUND UNSATISFACTORY AND LIST SRO NUMBER ISSUED FOR CORRECTIVE ACTION. SIGN AND DATE TO VERIFY THAT THE DEFICIENCY HAS BEEN CORRECTED OR ACCEPTED AS IS. IDENTIFY DEFERRED ITEMS BY ANNOTATING A "D" IN THE SRO BLOCK. (SEE SECTION 2 FOR REQUIREMENTS FOR DEFERRAL OF WORK.)			
Item No.	Deficiency	SRO No.	Verification of Correction (Signature and Date)
2	Leak in filter at inlet line	9825	<i>John Doe</i> 12 08 06
51	Aux boom nose sheave worn	D	

**MISR BRAKE DATA SHEET**

The Brake Data Sheet is the last page of the MISR form. The certifying official should verify it for accuracy and completeness. Have all brake data measurements been recorded on the sheet? Are the OEM tolerances recorded in the minimum and maximum (MIN or MAX) columns? If OEM criteria are not available then verify the settings have local engineering and NCC approval. In some cases, depending on the type of brake in question, not all measurements may be filled in.

MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 CRANES BRAKE DATA										
SHEET _____ OF _____										
CRANE										
NOTE TO INSPECTOR: Fill in applicable data as recommended by the brake and/or crane OEM. Record actual measurement inspected in "INSP" block. If adjustments are made, record adjusted setting in "ADJ" block. Otherwise indicate "NA". List repair document number and corrective action required under remarks.										
BRAKE	TYPE	SPRING LENGTH/ TORQUE SETTING				AIR GAP/ PLUNGER STROKE			LINING THICKNESS	
		MIN	MAX	ACTUAL		MIN	MAX	ACTUAL	MIN	ACT
				INSP	ADJ			INS	ADJ	
HOIST	PM	5 3/8	5 1/2	5 5/8	5 3/8	1/8	5/16	3/8	1/8	

**REQUIRED SIGNATURES ON MISR**

The certifying official should verify that both the mechanical and electrical inspectors have signed and dated the Maintenance Inspection and Specification Record. If only one person performs the inspections, that individual must have the pre-requisite training and qualifications to perform all of the applicable inspections as outlined in NAVFAC P-307, Section 13.

MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 CRANES UNSATISFACTORY ITEMS			
Crane 82-00051		SHEET 1 OF 1	
NOTE: DESCRIBE ITEMS FOUND UNSATISFACTORY AND LIST SRO NUMBER ISSUED FOR CORRECTIVE ACTION. SIGN AND DATE TO VERIFY THAT THE DEFICIENCY HAS BEEN CORRECTED OR ACCEPTED AS IS. IDENTIFY DEFERRED ITEMS BY ANNOTATING A "D" IN THE SRO BLOCK. (SEE SECTION 2 FOR REQUIREMENTS FOR DEFERRAL OF WORK.)			
Item	SRO	Verification of Correction	
Mechanical Inspector (Signature):	Date:	Electrical Inspector (Signature):	Date:
<i>D.N. Smith</i>	10 Dec 03	<i>Pat Reedh</i>	10 Dec 03

**CRANE CONDITION INSPECTION RECORD (CCIR)**

The Crane Condition Inspection and Record form, referred to by the acronym CCIR is used for all categories of cranes and can be form found in the NAVFAC P-307 manual,

CRANE CONDITION INSPECTION RECORD				
Note: Inspect components that are reasonably accessible without disassembly.				
Crane No.:	Type:	Location:	Operator's Name:	Operator's License No.
Purpose of Inspection:	Legend: B = Before A= After D = During	Date Started:	Date Completed:	
Item No.	Item Description	B	D	A Insp/ Init.
1	Inspect structural components for damaged or deteriorated members, and for evidence of loose and missing fasteners and cracked welds.			

Figure 3-3. The CCIR is completed by the inspector and test director to document the condition of the crane before, during and after a load test. Section 3 of NAVFAC P-307 contains information about completing the CCIR. As the certifying

official, you should verify that the following has been done: The information blocks at the top of the first sheet must be annotated with the correct information. Each inspection block shall be marked as satisfactory (S), unsatisfactory (U), or not applicable (N/A). Initials and check marks are not allowed since the column headings are before, during, and after indicating when the inspection was performed. The *INSPECTOR/ INITIAL* column Must be initialed for each item. If a block is marked "U", is a description of the unsatisfactory condition noted in the remarks section of the form? For category 3 jib, pillar, or monorail cranes, and fixed overhead hoist, if no major deficiencies are found in the maintenance inspection and if no work is done between the maintenance inspection and the load test, the maintenance inspection can serve as the "before" portion of the condition inspection. Both inspection forms shall be complete. All major deficiencies shall be corrected prior to completing the load test.

**CCIR'S**

If a major deficiency is found after the load test, it shall be corrected, and a selective load test shall be performed to test the component or components corrected. When a selective load test is performed, a condition inspection shall be performed on all items in the CCIR that experience greater than normal loading to ensure that the load test has not caused any damage. A record of this retest shall be recorded in the "Remarks" portion of the CCIR and should be examined for accuracy. Make sure the method for testing the load brake is described in the remarks section of the CCIR. If the remarks section is not used, a detailed written procedure must be developed. Review the signature blocks at the bottom of the form. The signature blocks should be signed and dated by the inspector and test director.

CRANE CONDITION INSPECTION RECORD							
Note: Inspect components that are reasonably accessible without disassembly.							
Crane No.:	Type:	Location:	Operator's Name:	Operator's License No.:			
Purpose of Inspection:		Legend: B = Before A = After D = During	Date Started:	Date Completed:			
Item No.:	Item Description			B	D	A	Insp Inst.
1	Inspect structural components for damaged or deteriorated members, and for evidence of loose and missing fasteners and cracked welds.						
2	Inspect wire rope for wear, broken wires, corrosion, kinks, damaged strands, crushed or flattened sections, condition of sockets, dead end connections, and for proper lubrication.						
Remarks:							
Inspector Signature/Date:				Test Director Signature/Date:			

**CERTIFICATION OF LOAD TEST**

CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION			
Activity		Existing Location	
Crane No. Type	OEM's Rated Capacity	Certified Capacity	
Main _____ Lbs. _____ Met		(If different from OEM's rated capacity, explain in "Remarks")	
Aux _____ Lbs. _____ Met		Main _____ Lbs. _____ Met	
W/tp _____ Lbs. _____ Met		Aux _____ Lbs. _____ Met	
W/tp _____ Lbs. _____ Met		W/tp _____ Lbs. _____ Met	
<input type="checkbox"/> Annual Certification	<input type="checkbox"/> Recalibrated Load Test	<input type="checkbox"/> Recalibrated Certification	Appendix "E" Applicable Crane Test Procedure Paragraphs (include applicable subparagraphs.)
<input type="checkbox"/> Within Recertification (Please _____)			
Category 1 or 4 Cranes *			
Boom Length	Test Load %	Minimum Payload Pounds	Maximum Payload Pounds
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
HOIST			

Most certifications are preceded by a load test. Category 2 and 3 cranes shall be inspected, operationally tested (w/load), and certified annually, however, a load test shall be performed at every fourth annual certification, as a minimum. The Certification of Load Test and Condition Inspection Form documents the load test. Important points to verify: Verify the information blocks are annotated

with the required information at the top of each sheet. If the certified capacity is different from the OEM capacity, the reason must be explained in the remarks section. A typical case might be if a crane is reconfigured with fewer parts of hoist line. Verify the appropriate test load has been used in the calculation of test weights. Mobile cranes are load tested at **105%** of rated capacity; all other crane types are load tested at 125% of rated capacity.

**CERTIFICATION OF LOAD TEST - ADDITIONAL VERIFICATIONS**

The Certification of Load Test and Condition Inspection Form documents the load test. Other points to verify: Verify the hook tram measurements are listed including the base measurement. Verify the annual certifications since the last hook NDT have been listed. Confirm all of the appropriate test paragraphs (including subparagraphs and notes) from Appendix E, are listed on the load test form. In order to confidently make this confirmation, the certifying official must be familiar with the configuration of the crane during load test. Some configuration changes might be whether or not the crane is equipped with a load brake or, whether a

CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION			
Activity		Existing Location	
Crane No. Type	OEM's Rated Capacity	Certified Capacity	
Main _____ Lbs. _____ Met		(If different from OEM's rated capacity, explain in "Remarks")	
Aux _____ Lbs. _____ Met		Main _____ Lbs. _____ Met	
W/tp _____ Lbs. _____ Met		Aux _____ Lbs. _____ Met	
W/tp _____ Lbs. _____ Met		W/tp _____ Lbs. _____ Met	
<input type="checkbox"/> Annual Certification	<input type="checkbox"/> Recalibrated Load Test	<input type="checkbox"/> Recalibrated Certification	Appendix "E" Applicable Crane Test Procedure Paragraphs (include applicable subparagraphs.)
<input type="checkbox"/> Within Recertification (Please _____)			
Category 1 or 4 Cranes *			
Boom Length	Test Load %	Minimum Payload Pounds	Maximum Payload Pounds
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
HOIST			

CERTIFYING OFFICIAL STUDENT GUIDE

mobile crane being certified with an on-rubber capacity is actually allowed free rated capability by OEM.

**SUPPLEMENTAL FORM FOR MOBILE CRANES**

When testing mobile cranes, in addition to the Certification of Load Test form, a supplemental form will be needed. This form is used because mobile cranes generally have ancillary equipment such as jibs and interchangeable hook blocks, which must be tested. The Certification of Load Test form does not have room for all of these additional tests, so the supplemental form is used. One example of when this form may be used is when the crane has “on-tires” or “free-rated” capabilities, which must be tested. When reviewing mobile crane load test documentation, make sure that the supplemental form has been used as necessary and that all required tests have been identified. Confirm that the actual test loads being applied to the crane are based on the total weight of the test weights, rigging gear, and applicable attachments, components, and equipment (as specified on the OEM load chart). Typical considerations may include may include the weight of the jib, whether erected or stowed, overhaul ball, hook block, auxiliary boom nose, and in some cases the weight of the wire rope.

CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION (SUPPLEMENT FOR MOBILE CRANE TESTS)									
Complete as applicable for the type of crane certified. Indicate "NA" for configurations that do not apply.									
Crane No.		Telescoping Boom Crane							
Lattice Boom Crane									
Boom Length (Feet)									
On Outriggers		Test Load	Radius	On Outriggers		Test Load	Radius	Boom Length	
Min. Radius				Min. Radius Boom Retracted					
Max. Radius				Min. Radius Boom Extended					
On Tires (Stationary)		Test Load	Radius	Max. Radius (Boom 50% Extended)					
Min. Radius				On Tires (Stationary)		Test Load	Radius	Boom Length	
Max. Radius				Min. Radius					
On Tires (Pick and Carry)				Max. Radius (Boom 50% Extended)					
(Describe configurations and list test loads/radii)				On Tires (Pick and Carry)					
Other Configurations, including ancillary equipment if applicable. (Describe and list test loads/radii)									

**SHOP REPAIR ORDERS**

All work performed on cranes shall be documented on a Shop Repair Order (SRO) or other work document. If reviewing a SRO or other work document, ask yourself: - Are the information blocks filled out with the correct information? - Does the SRO clearly

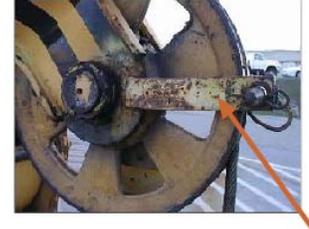
NAVFAC 1120020A (Rev. 1-73) SUPERSEDES NAVDOCK5148 SN-0105-LF-004-1001										
SHOP REPAIR ORDER							(1) PAGE OF	(2) SRO NUMBER	(3) JOB ORDER NUMBER	(4) USN NUMBER
(5) DESCRIPTION	(6) MAKE	(7) MODEL	(8) EQUIP. CODE		(9) DOD ALPHA					
(10) ACTIVITY	(11) PHONE NUMBER	(12) LAST "A" TYPE PM	(13) LAST "B" TYPE PM	(14) LAST "C" TYPE PM	(15) ACCV. MILES/HR.					
TO BE COMPLETED UPON EQUIPMENT AVAILABILITY FOR MAINTENANCE REPAIR										
(16) PM GROUP	(17) PM TYPE DUE	(18) DATE DUE	(19) DOWNTIME			(20) PRESENT METER READING				
		IN		OUT		TOTAL HOURS				
		DATE	TIME	DATE	TIME	HOURS				

describe, in detail, the work performed? Are all replacement parts and part numbers listed? - Are the appropriate test and/or re-certification requirements listed? - Have the approval and completion blocks been signed and dated? When adjustment or repair of a load bearing or load controlling part or operation safety device does not require a

load test for verification of satisfactory work, one of the following (at the activity's option) is required prior to returning the crane to service. After all work, inspection, and operational testing required by NAVFAC P-307 section 2 are completed, the work document(s) shall be signed by the chief engineer or the certifying official. An interim re-certification is not required. A selective inspection, operational test, and recertification shall be performed. This is in addition to the inspection requirements of NAVFAC P-307 section 2.

### ALTERATIONS

When reviewing crane certification documentation, the certifying official should check to see if any of the repairs described on the Shop Repair Order or in the Maintenance Inspection Specification and Record would constitute an alteration. If so, verify that the approval has gone to the proper level. Alterations to load bearing parts, load controlling parts, or operational safety devices must have the approval of the Navy Crane Center. Other alterations may be approved locally but the Navy Crane Center must be copied within 14 days. Section 4 of NAVFAC P-307 describes alterations and gives guidance on the approval process. The illustration shows an example of an alteration in the form of a bracket that has been welded onto the boom tip. Since the boom tip assembly is a load bearing part, approval from the Navy Crane Center would be required.



# NOTES

DOCUMENTATION REVIEW MODULE EXAM

*Online exam questions may appear in a different order than those listed below.*

1. At a minimum, the crane certification package contains \_\_\_\_\_.
  - A. Maintenance Inspection Specification and Record
  - B. Crane Condition Inspection Record
  - C. Certificate of Load Test and Condition Inspection
  - D. all of the listed items
  
2. The Crane Condition Inspection Record can be substituted for the Certification of Load Test and Condition Inspection.
  - A. True
  - B. False
  
3. The Crane Condition Inspection Report (CCIR) is used for \_\_\_\_\_.
  - A. category 1 and category 4 cranes
  - B. all crane categories
  - C. category 2 and category 3 cranes
  
4. The AMISR or Annual Maintenance Inspection Specification and Record form is \_\_\_\_\_.
  - A. category 1 and category 4 cranes
  - B. used with all crane categories
  - C. used for category 2 and category 3 cranes
  
5. To document the current condition of the crane WHE personnel would use:
  - A. Certification of Load Test and Condition Inspection
  - B. MISR
  - C. AMISR
  - D. Crane Condition Inspection Record
  
6. The Certification of Load Test and Condition Inspection is reviewed and signed by \_\_\_\_\_.
  - A. all personnel listed
  - B. certifying official
  - C. load test director
  - D. only the inspectors (mechanical or electrical)
  - E. inspectors (mechanical or electrical)

CERTIFYING OFFICIAL STUDENT GUIDE

7. The Crane Condition Inspection Record is filled out by the \_\_\_\_\_.

- A. load test director, condition inspector and the certifying official
- B. condition inspector
- C. load test director and condition inspector
- D. certifying official
- E. load test director

8. The MISR or Maintenance Inspection Specification and Record form is \_\_\_\_\_.

- A. used for category 2 and category 3 cranes
- B. used with all crane categories
- C. used for category 1 and category 4 cranes

9. On the MISR and AMSIR all inspection blocks must be marked S, U, or C for \_\_\_\_\_.

- A. satisfactory, unsatisfactory, continuing
- B. satisfactory, unsatisfactory, corrected
- C. satisfactory, unsatisfactory, current

10. Each MISR or AMISR must be signed by \_\_\_\_\_.

- A. only the mechanical inspector
- B. only the electrical inspector
- C. all participating inspectors
- D. only the certifying official

11. The Crane Condition Inspection Record uses columns marked B, D, A for each item number and item description. These letters designate \_\_\_\_\_.

- A. crane conditions
- B. load test stages
- C. personnel involved

12. Alterations to load bearing parts, load controlling parts or operational devices must have the approval of \_\_\_\_\_.

- A. Navy Crane Center
- B. certifying official
- C. load test director

## CERTIFYING OFFICIAL STUDENT GUIDE

13. On the MISR or the AMISR, if an item in the inspection block is marked U (unsatisfactory), it...

- A. brought to the attention of the load test director
- B. must be listed on the Unsatisfactory Items Worksheet
- C. deferred until the item is necessary

14. A certifying official is responsible for reviewing all documents carefully. The certifying official will verify \_\_\_\_\_.

- A. all appropriate signatures are present
- B. all applicable spaces are filled
- C. there is not missing information
- D. all points listed

## LOAD TESTS – OVERVIEW

### THE PURPOSE OF THE LOAD TEST

The purpose of load testing is to ensure by controlled operation with prescribed test loads, that the equipment is capable of safely lifting and moving the rated load through all design motions.



### TEST DIRECTOR RESPONSIBILITIES

The test director ensures the load test is done safely and efficiently. Crane load tests are overload conditions, requiring extreme caution and control.

### TEST DIRECTOR QUALIFICATIONS

Test directors must be qualified to oversee and direct load tests. They must be trained according NAVFAC P-307, technically competent and knowledgeable, and understand the duties of other test members as described in P-307 appendix N. The test director is designated, in writing, by the certifying official of the naval activity.



### TEST DIRECTOR TRAINING

The load test director must have the required training and background to perform a load test safely and efficiently. The load test director will know the operational characteristics of the weight handling equipment being tested and the components being tested. The load test director also knows how to interpret load charts and proper crane communications, including, hand signals.



### WHO APPOINTS THE LOAD TEST DIRECTOR?

The certifying official, appointed by the commanding officer of the activity, designates in writing all test directors and condition inspectors.

### WHEN LOAD TESTS ARE NECESSARY

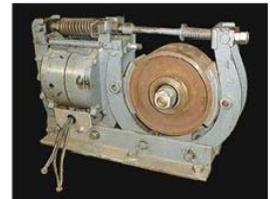
Cranes, including all types of category 1, 2, 3, and 4 cranes, which are in an annual certification program shall be load tested at every annual certification. The crane certification shall indicate when a crane is in the quadrennial load test program. When the adjustment, repair, disassembly, alteration, or replacement of a load bearing part, load controlling part, or operational safety device requires a load test for verification of satisfactory work performed, a load test is required. If an inadvertent overload exceeds 110% of the certified capacity, a load test is required (along with the condition inspection) for recertification.

### RE-CERTIFICATION

WHE certifications are good for one year unless voided. Re-certification requires a condition inspection. Depending on the type of crane, a load test is required at every annual certification. Certification is void whenever the rated capacity is exceeded, except during a load test. Selective load tests and re-certification may be required after an adjustment, repair, disassembly, replacement, or alteration of load-bearing and in some cases load-controlling components. Load-controlling components, such as the rotate function on a floating crane, may require load testing to verify satisfactory work. Some exceptions apply for brake adjustments and certain disassembly and reassembly procedures.

### SELECTIVE LOAD TESTS

Selective load tests for interim re-certification are required when adjustment, repair, disassembly, alteration, or replacement of a load bearing part, load controlling part, or operational safety device requires a load test to verify the work performed. A selective load test is limited to components in an affected system. Specific test procedures may be determined by the crane engineers. Disassembly or repair to the load holding brake on a hoist, requires both a static and dynamic test for only for the hoist system. Some repairs may be excluded from a selective load test.



# NOTES

LOAD TESTS OVERVIEW MODULE EXAM

*Online exam questions may appear in a different order than those listed below.*

1. During the annual certification of a category 1 crane \_\_\_\_\_.
  - A. a load test is required
  - B. a load test is not required
  - C. a load test is performed at the discretion of the load test director
  
2. Load Test Directors must be trained and knowledgeable on which of the following?
  - A. NAVFAC P-307 load test requirements
  - B. interpretation of OEM load charts
  - C. crane safety
  - D. calculation of weight for load tests
  - E. All of the listed factors
  
3. When only one load bearing component in a hoist is affected \_\_\_\_\_.
  - A. a load test is required
  - B. a load test is not required
  - C. a load test is performed at the discretion of the load test director
  
4. After disassembly of most load bearing parts \_\_\_\_\_.
  - A. a load test is required
  - B. a load test is not required
  - C. a load test is performed at the discretion of the load test director
  
5. Which of the following statements BEST describes the purpose of load testing cranes?
  - A. so that naval activities can be sure the equipment will not fail when in use
  - B. to ensure that the crane is designed according to industry standards
  - C. To ensure that the equipment is capable of safely lifting and moving rated loads through all design motions
  - D. to see if the equipment will fail under capacity loads
  
6. Which of the following is not a requirement to become a load test director?
  - A. technically competent
  - B. knowledgeable of team member responsibilities
  - C. designated in writing by the certifying official of the activity
  - D. trained according to P-307
  - E. certified by OSHA

CERTIFYING OFFICIAL STUDENT GUIDE

7. When a brake is adjusted within the manufactures tolerances \_\_\_\_\_.

- A. a load test is required
- B. a load test is not required
- C. a load test is performed at the discretion of the load test director

8. Which of the following is not a responsibility of the load test director?

- A. completes the paperwork for the test
- B. coordinates team member activities during test
- C. performs the post inspection of the crane
- D. directs or controls the load test
- E. checks test weight calculations

9. To verify satisfactory repair of a load bearing part \_\_\_\_\_.

- A. a load test is required
- B. a load test is not required
- C. a load test is performed at the discretion of the load test director





### SELECTING THE TEST SITE

Selecting a suitable test area is important. Considerations include sufficient room, adequate support, and traffic. Test sites must always be secured.



### PREP TEST SITE

Preparing both equipment and personnel are part of test site preparations.

### MAKING THE TEST SITE SAFE

Erect barriers to prevent entry of unauthorized personnel and vehicles into the test area. The barricaded area should be large enough to protect personnel should a major component fail, such as a boom. Enforce the barriers with the help of other test-team members to keep the test site safe.



### TEST WEIGHTS

Here are the specific requirements for test weights.

### TOTAL TEST LOAD

Total test loads must be calculated for specific cranes and specific tests.



### STAGING THE WEIGHTS

Prior to the load test, all rigging gear, test weights, and test load calculations need to be inspected and verified.



### TEST TEAM BRIEFING

After the pre-test preparations are complete and the test is ready to begin, the Load Test Director will conduct a Test Crew Briefing.

### COMMUNICATIONS

Clear communication is vital to the safety of personnel and equipment during a test. The communication method and a designated signal person must be established. It should be emphasized to the test team that anyone can give an emergency stop signal and anytime communication is lost during the test, the operator is to automatically stop operations.



### TESTING PRECAUTIONS

During the test, normal operating speed shall be used. Rated equipment speeds do not need to be attained. The emphasis shall be placed on the ability to safely control loads through all motions at normal speed. Use extreme caution during the tests. These tests are overload tests that may cause failure. Personnel must stay clear of suspended loads and out of areas where they could be struck by a falling hoist assembly or boom. Finally, raise the test weights just high enough to perform the test. This will help to prevent the crane from tipping if problems arise.



### COMPLETE CRANE CONDITION INSPECTION REPORT (CCIR)

Prior to the test, ensure the 'Before' portion of the CCIR is completed.



# NOTES

[RECORDS AND REQUIREMENTS MODULE EXAM](#)

*Online exam questions may appear in a different order than those listed below.*

1. Pretest team briefings shall include which of the following items?
  - A. communication methods
  - B. specific test procedures
  - C. individual job assignments
  - D. traffic control
  - E. all listed items
  
2. A briefing for new test team members shall be done...
  - A. once at the beginning of a test
  - B. only if the test director deems it necessary
  - C. Any time a new member joins the team
  - D. only when a turnover cannot be given by the replaced member
  
3. Which of the following are important steps in preparing for a successful crane load test?
  - A. research the crane history file
  - B. perform the "Before" portion of the CCIR
  - C. select a suitable test site
  - D. calculate and select test weights
  - E. All listed steps are important
  
4. The total test loads for mobile cranes must be calculated using which of the following formulas?
  - A. 1.20 times the rated capacity, +5, -0% tolerance
  - B. 1.25 times the rated capacity, +5, -0% tolerance
  - C. 1.05 times the rated capacity, +5, -0% tolerance
  - D. 1.10 times the rated capacity, +5, -0% tolerance
  
5. The most important difference between a major deficiency and a minor deficiency for load testing purposes, is that major deficiencies...
  - A. must be evaluated by a crane engineer
  - B. are identified by a comprehensive list in NAVFAC P-307
  - C. hinder the safe operation of the crane or reduce the load bearing or load controlling capacity of the crane
  - D. will not affect safe testing of the crane

6. Which one of the following is not an important test site consideration when selecting a suitable area?

- A. has sufficient room for the set-up and test
- B. have permanent barriers to keep people out
- C. has minimal vehicle and pedestrian traffic
- D. provides adequate support for the test

7. The OEM crane manual should provide all of the following information about a mobile crane except...

- A. the load rating chart
- B. load test calculation sheets
- C. procedures to erect ancillary devices
- D. crane outrigger set-up instructions
- E. procedures to change crane configuration

8. The primary purpose of the Crane Condition Inspection is best described by which of the following statements?

- A. to identify changes in condition during the test
- B. to find any damage resulting from the test
- C. To ensure that the overall structure, mechanical and electrical components of the equipment have been maintained in a safe and serviceable condition and are functioning properly.
- D. to ensure the crane is in good conditions before the test

9. A Crane Condition Inspection for most cranes must be done at which of the following frequencies?

- A. before the load test only
- B. before, during and after the load test
- C. after the load test only
- D. only during the load test



## OET LOAD TESTS

An OET load test checks the integrity and function of crane components through a series of tests.



### NO LOAD OPERATIONAL TEST

The no-load test proves all crane functions for proper operation. The no-load testing procedure may vary for specific cranes.

### EMERGENCY HOIST DRUM BRAKE

For cranes equipped with emergency drum brakes, simulate a fault.



### STATIC LOAD TEST

Each hook is tested separately.

### PRIMARY AND SECONDARY BRAKE

Follow this procedure for cranes that are equipped with primary and secondary brakes.





**DYNAMIC LOAD TEST**

Perform a dynamic load test on each hoist by hoisting and lowering the test load using normal operating speeds and watching for smooth operation.

**LOAD BRAKE TESTING**

Test the mechanical load brake, when equipped and accessible.



**LOSS OF POWER TEST**

The loss of power, or panic test, is designed to test a hoisting unit's ability to stop the load if power fails during a lift.

**EMERGENCY HOIST DRUM BRAKE TEST**

After testing the other holding brakes, test the emergency hoist drum brake, when equipped, with a 100% test load plus five, minus zero percent.



**TROLLEY AND BRIDGE LOAD TEST**

Operate the trolley the full distance of travel or as space allows.

### TROLLEY AND BRIDGE LOSS-OF-POWER TEST

For each bridge or trolley, without automatic brakes, test the crane's ability to stop under loss of power.



### JIB, PILLAR AND PILLAR-JIB TESTS

Perform the no-load and load test on jib, pillar, and pillar-jib cranes following this procedure.

# NOTES

LOAD TESTING CATEGORY 2 AND 3 CRANES MODULE EXAM

*Online exam questions may appear in a different order than those listed below.*

1. During the static portion of the load test, which item below are you not checking?
  - A. hook bearing/rotation
  - B. brake slippage
  - C. hoist speeds
  
2. Where a hoist is equipped with primary and secondary brakes, each brake must be individually tested to support the load for \_\_\_\_\_.
  - A. 2 minutes
  - B. 5 minutes
  - C. 6 minutes
  - D. 10 minutes
  
3. A no-load operational check is the start of every load test.
  - A. True
  - B. False
  
4. Which item below is not included on the Certification of Load Test and Condition Inspection?
  - A. test paragraph numbers
  - B. crane identification
  - C. calculated load weights for each hook
  - D. crane weight
  - E. hook tram measurements
  
5. When testing electrically powered cranes, we need to prove that the crane will come to a safe stop in the even of a power failure.
  - A. True
  - B. False
  
6. Any safety device on a crane must be included in the inspection and test for function.
  - A. True
  - B. False
  
7. Hooks showing an increase \_\_\_\_\_ must be replaced.
  - A. of more than 5%
  - B. of more than 10%
  - C. of more that 15%
  - D. that can be seen with the naked eye

**CATEGORY 2 AND 3 EXERCISE**

*You will need a copy of the Bridge\_Crane\_Certification\_Package.pdf*

DIRECTIONS



**Certifying Official**

**Bridge Crane Certification Package Review**

● **Directions**

Exercise 1

Exercise 2

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Exercise 12

**Bridge Crane Certification Package Review**

As the certifying official, you received the certification package ***Bridge Crane Certification***. The crane is a 25,000 lb. capacity bridge crane. Included in the package are the AMISR, the CCIR for the Load Test and the Load Test Certification form.

For this exercise, you will review the certification package submitted for your signature. Review the package for errors or questionable items. Determine if the certification is ready to be signed or if there are errors in testing or certification paperwork, which may delay certification.

After reviewing the package, continue with the exercise to verify your review.



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EXERCISE 1



# Certifying Official

## Bridge Crane Certification Package Review

Directions

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ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES SHEET <u>1</u> OF <u>11</u>							
Crane 349	Type Bridge	Manufacturer Wallace & Grommet	Capacity 25,000 lbs.				
Prior Inspection		Current Inspection		Legend: Check under condition			
DATE 03/06/08		DATE 03/02/09		S=Satisfactory C=Corrected (if deferred, leave blank and identify on Unsatisfactory Items sheet) U=Unsatisfactory NA=Not Applicable			
Item No	Items to be inspected	Maintenance Inspection Specification	System Inspected	Condition			
				S	U	C	NA
7	Shafts and Couplings	Inspect for evidence of damage, misalignment, leaking seals, and loose keys, coupling bolts, and covers. During operation, inspect for vibration, overheating, and other evidence of misaligned, worn, or damaged components or bearings. Listen for abnormal noise.	TROLLEY BRIDGE HOIST	X X X			
	Shafts and Couplings (Hoist Drives)	Verify coupling alignments are within OEM tolerances (not applicable to NEMA c, d, and p-face motors, or similar configurations). Coupling alignment verifications shall be completed by June 2001. After initial verification, verify alignment at every sixth annual inspection. Coupling alignment verification data shall be included in the crane's history file.					X

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

[Print PDF](#)



EXERCISE 2



Certifying Official

Bridge Crane Certification Package Review

Directions

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- Exercise 6
- Exercise 7
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- Exercise 9
- Exercise 10
- Exercise 11
- Exercise 12

ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES SHEET 2 OF 11							
Crane 349	Type Bridge	Manufacturer Wallace & Grommet	Capacity 25,000 lbs.				
Prior Inspection DATE 03/06/08		Current Inspection DATE 03/02/09	Legend: Check under condition S=Satisfactory C=Corrected (if deferred, leave blank and identify on Unsatisfactory Items sheet) U=Unsatisfactory NA=Not Applicable				
Item No	Items to be inspected	Maintenance Inspection Specification	System Inspected	Condition			
				S	U	C	NA
8b	Gearing (Hoist, Rotate, Travel) Internal Gears, including clutches. (Not applicable to manual chain hoists).	Inspect gear case for proper lubricant level. Inspect for leaks and for evidence of loose or missing fasteners. Inspect breathers for restrictions. During operation, inspect for vibration, overheating, and other evidence of misaligned, worn, or damaged internal components or bearings. Listen for abnormal noise.	HOIST BRIDGE TROLLEY	X	X		
	Hoist Gears (Not applicable to category 2 & 3 package hoist assemblies or manual chain hoists.)	Additionally, internal gearing for hoists shall be monitored by an oil or vibration analysis program. The oil or vibration analysis shall be performed at least once each certification period with results analyzed by a qualified source and documented and retained in the equipment history file for the life of the component.  As an alternative to oil or vibration analysis, internal gears shall be visually inspected for wear or damage and for evidence of misalignment. If all gears can not be visually inspected through inspection ports or by video probe or similar inspection devices, gear cases shall be disassembled for visual inspection. If this alternative is selected, perform at every tenth annual inspection.					

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

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EXERCISE 3



Certifying Official

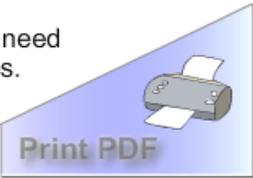
Bridge Crane Certification Package Review

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ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES SHEET <u>2</u> OF <u>11</u>							
Crane	Type	Manufacturer	Capacity				
349	Bridge	Wallace & Grommet	25,000 lbs.				
Prior Inspection		Current Inspection		Legend: Check under condition			
DATE		DATE		S=Satisfactory	C=Corrected (if deferred, leave blank and identify on Unsatisfactory Items sheet)		
03/06/08		03/02/09		U=Unsatisfactory	NA=Not Applicable		
Item No	Items to be inspected	Maintenance Inspection Specification	System Inspected	Condition			
				S	U	C	NA
9b	Mechanical Load Brakes - Manual Hoists	Inspect for evidence of worn, glazed, or oil contaminated friction discs; worn pawls, cams or ratchet; corroded, stretched, or broken pawl springs in brake mechanism. Manual hoist load brakes shall be disassembled at every sixth annual inspection for detailed inspection of above noted items.		X			

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)



EXERCISE 4



Certifying Official

Bridge Crane Certification Package Review

Directions

Exercise 1

Exercise 2

Exercise 3

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Exercise 5

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Exercise 10

Exercise 11

Exercise 12

ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES SHEET 5 OF 11							
Crane 349		Type Bridge	Manufacturer Wallace & Grommet		Capacity 25,000 lbs.		
Prior Inspection		Current Inspection		Legend: Check under condition			
DATE 03/06/08		DATE 03/02/09		S=Satisfactory C=Corrected (if deferred, leave blank and identify on Unsatisfactory Items sheet) U=Unsatisfactory NA=Not Applicable			
Item No	Items to be inspected	Maintenance Inspection Specification	System Inspected	Condition			
				S	U	C	NA
16	Wire Rope, Fastenings, and Terminal Hardware*	Thoroughly inspect entire length of wire rope. The depth and detail of the inspection shall be that necessary to ensure that the entire rope is acceptable with special attention paid to areas of expected wear or damage, and to areas not normally visible to the operator during operation or pre-use check. During the inspection, the wire rope shall be payed out as far as possible. For sections that can not be spooled off the drum, visual inspection of the wire rope on the drum is sufficient. Remove wire rope dressing from selected areas subjected to significant wear, exposure, and abuse. Dimensional (diameter) measurements shall be performed at several places over the length of the rope. Record minimum dimension measured in the "remarks" block. Expose and examine sections in contact with equalizer sheaves and saddles or where corrosion may develop because of poor drainage. Lubricate areas after inspection. Inspect sockets, swivels, trunnions, and connections for undue looseness, wear, cracks, corrosion, or other damage. Undue looseness in poured sockets is defined as looseness or evidence of slippage of wires in the securing material, evidence of deterioration of the securing material, looseness of wire rope strands or wires adjacent to the socket or any looseness resulting from cracks or other defects in the basket. Evidence of looseness between the securing material and the basket resulting solely from seating of the material in basket is acceptable. Drum end fittings need only be disconnected or disassembled when experience or visible indications deem it necessary. The Federal Specification for wire rope is RR-W-410.	1/2"	X			

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)


  
[Print PDF](#)

EXERCISE 5



# Certifying Official

## Bridge Crane Certification Package Review

Directions

Exercise 1

Exercise 2

Exercise 3

Exercise 4

● Exercise 5

Exercise 6

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Exercise 10

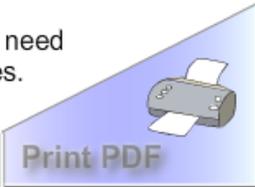
Exercise 11

Exercise 12

ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES SHEET <u>5</u> OF <u>11</u>								
Crane	Type	Manufacturer		Capacity				
349	Bridge	Wallace & Grommet		25,000 lbs.				
Prior Inspection		Current Inspection		Legend: Check under condition				
DATE 03/06/08		DATE 03/02/09		S=Satisfactory    C=Corrected (if deferred, leave blank and identify on Unsatisfactory Items sheet) U=Unsatisfactory    NA=Not Applicable				
Item No	Items to be inspected	Maintenance Inspection Specification		System Inspected	Condition			
17	Load Chains and Sprockets	Inspect for damage or deterioration, and for evidence of loose or missing fasteners and cracked welds. Measure for increase in chain length. Record measurements or gage part/drawing number in the "remarks" block. Ensure chain is properly oriented with link welds facing away from load sprockets unless otherwise specified by the OEM. During operation, listen for abnormal noise. Inspect for overheating and other evidence of worn or damaged components and bearings.			S	U	C	NA
					X			

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)



EXERCISE 6



## Certifying Official

### Bridge Crane Certification Package Review

**Directions**

Exercise 1

Exercise 2

Exercise 3

Exercise 4

Exercise 5

● Exercise 6

Exercise 7

Exercise 8

Exercise 9

Exercise 10

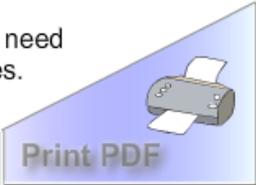
Exercise 11

Exercise 12

ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES SHEET <u>6</u> OF <u>11</u>							
Crane	Type	Manufacturer	Capacity				
349	Bridge	Wallace & Grommet	25,000 lbs.				
Prior Inspection		Current Inspection		Legend: Check under condition			
DATE		DATE		S=Satisfactory	C=Corrected (if deferred, leave blank and identify on Unsatisfactory Items sheet)		
03/06/08		03/02/09		U=Unsatisfactory	NA=Not Applicable		
Item No	Items to be inspected	Maintenance Inspection Specification	System Inspected	Condition			
				S	U	C	NA
23	Electrical Hardware and General Lighting	Inspect conduits, raceways, and junction boxes for damage or deterioration, and for evidence of loose connections. Inspect light fixtures and associated wiring for damage or deterioration, and for evidence of loose connections. Verify operation of lights.			x		

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)



EXERCISE 7



# Certifying Official

## Bridge Crane Certification Package Review

Directions

Exercise 1

Exercise 2

Exercise 3

Exercise 4

Exercise 5

Exercise 6

• Exercise 7

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Exercise 10

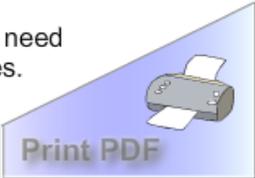
Exercise 11

Exercise 12

ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES SHEET <u>7</u> OF <u>11</u>							
Crane 349	Type Bridge	Manufacturer Wallace & Grommet	Capacity 25,000 lbs.				
Prior Inspection		Current Inspection		Legend: Check under condition			
DATE 03/06/08		DATE 03/02/09		S=Satisfactory C=Corrected (if deferred, leave blank and identify on Unsatisfactory Items sheet) U=Unsatisfactory NA=Not Applicable			
Item No	Items to be inspected	Maintenance Inspection Specification	System Inspected	Condition			
				S	U	C	NA
26	Resistors	Inspect resistors, insulators, and brackets for damage, distortion, or deterioration, and for evidence of loose or missing fasteners. Inspect wiring for damage or deterioration, and for evidence of loose connections. Inspect for evidence of overheating.					X

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)



EXERCISE 8



# Certifying Official

## Bridge Crane Certification Package Review

Directions

Exercise 1

Exercise 2

Exercise 3

Exercise 4

Exercise 5

Exercise 6

Exercise 7

● Exercise 8

Exercise 9

Exercise 10

Exercise 11

Exercise 12

ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES SHEET 7 OF 11							
Crane 349	Type Bridge	Manufacturer Wallace & Grommet		Capacity 25,000 lbs.			
Prior Inspection DATE 03/06/08		Current Inspection DATE 03/02/09		Legend: Check under condition S=Satisfactory      C=Corrected (if deferred, leave blank and identify on Unsatisfactory Items sheet) U=Unsatisfactory    NA=Not Applicable			
Item No	Items to be inspected	Maintenance Inspection Specification	System Inspected	Condition			
				S	U	C	NA
28	Eddy Current Brakes	Inspect for cleanliness, damage, or deterioration, and for evidence of loose connections. Inspect for proper lubrication. Inspect wiring for damage or deterioration, and for evidence of loose connections. During operation, listen for any abnormal noise. Inspect for vibration, overheating, or other evidence of misaligned, worn, or damaged internal components or bearings.		X			

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

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EXERCISE 9



Certifying Official

Bridge Crane Certification Package Review

Directions

- Exercise 1
- Exercise 2
- Exercise 3
- Exercise 4
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- Exercise 6
- Exercise 7
- Exercise 8
- Exercise 9
- Exercise 10
- Exercise 11
- Exercise 12

ANNUAL MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES			
UNSATISFACTORY ITEMS		SHEET <u>10</u> OF <u>11</u>	
Crane			
NOTE: DESCRIBE ITEMS FOUND UNSATISFACTORY AND LIST SRO NUMBER ISSUED FOR CORRECTIVE ACTION. SIGN AND DATE TO VERIFY THAT THE DEFICIENCY HAS BEEN CORRECTED OR ACCEPTED AS IS. IDENTIFY DEFERRED ITEMS BY ANNOTATING A "D" IN THE SRO BLOCK. (SEE SECTION 2 FOR REQUIREMENTS FOR DEFERRAL OF WORK.)			
Item No.	Deficiency	SRO No.	Verification of Correction (Signature and Date)
Mechanical Inspector (Signature): <i>John Q. Smith</i>		Date: <i>03/04/09</i>	Electrical Inspector (Signature): 
			Date: 

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

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EXERCISE 10



Certifying Official

Bridge Crane Certification Package Review

Directions

Exercise 1

Exercise 2

Exercise 3

Exercise 4

Exercise 5

Exercise 6

Exercise 7

Exercise 8

Exercise 9

● Exercise 10

Exercise 11

Exercise 12

MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 2 AND 3 CRANES											
BRAKE DATA										Sheet 11 of 11	
CRANE 349:											
NOTE TO INSPECTOR : Fill in applicable data as recommended by the brake and/or crane OEM. Record actual measurement inspected in "INSP" block. If adjustments are made, record adjusted setting in "ADJ" block. Otherwise indicate "NA". List repair document number and corrective action required under remarks.											
BRAKE	TYPE	SPRING LENGTH/				AIR GAP/				LINING	
		TORQUE SETTING				PLUNGER STROKE				THICKNESS	
		MIN	MAX	ACTUAL		MIN	MAX	ACTUAL		MIN	ACT
				INSP	ADJ			INSP	ADJ		
HOIST	TM	5-1/8"	5-1/8"	5-1/8"	1/8"	1/8"	1/8"		1/16"	3/32"	3/8"
TROLLEY	TM 83	4"	4"		4"	1/16"	1/16"		1/16"	1/8"	1/4"
BRIDGE	TM 83	4"	4"		4"	1/16"	1/16"		1/16"	1/8"	1/4"

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

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EXERCISE 11



## Certifying Official

### Bridge Crane Certification Package Review

**Directions**

Exercise 1

Exercise 2

Exercise 3

Exercise 4

Exercise 5

Exercise 6

Exercise 7

Exercise 8

Exercise 9

Exercise 10

● Exercise 11

Exercise 12

#### CRANE CONDITION INSPECTION RECORDED

Note: Inspect Components that are reasonably accessible without disassembly.

Crane No: 349	Type: BRIDGE	Location: BLDG. 539	Operator's Name: Drew Southworth	Operator's License No. C20549
Purpose of Inspection: ANNUAL LOAD TEST		Legend: B = Before A = After D = During	Date Started: 03/06/02	Date Completed: 03/06/02
Item No:	Item Description			Insp/ Init.
22	Inspect pawls, ratchets, and rotate locks for proper engagement and operation of interlocks.			B D A S [REDACTED] JM

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.



[Discussion Notes](#)

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EXERCISE 12



# Certifying Official

## Bridge Crane Certification Package Review

### CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION

**Directions**

Exercise 1

Exercise 2

Exercise 3

Exercise 4

Exercise 5

Exercise 6

Exercise 7

Exercise 8

Exercise 9

Exercise 10

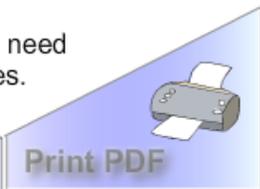
Exercise 11

● Exercise 12

Activity PWC LAS VEGAS				Building/Location Bldg. 539			
Crane No.	Type	OEM's Rated Capacity		Certified Capacity			
349	Bridge	Main	25,000 lbs.	_____ feet		(if different from OEM's capacity, explain in 'Remarks')	
		Aux	_____ lbs.	_____ feet		Main	25,000 lbs.
		Whip	_____ lbs.	_____ feet		Aux	_____ lbs.
						Whip	_____ lbs.
<input checked="" type="checkbox"/> Annual Certification		<input type="checkbox"/> Biennial Load Test Crane		Appendix "E", Applicable Crane Test Procedure Paragraphs (include applicable subparagraphs.)			
<input type="checkbox"/> Interim Recertification (Reason _____)				1	1.1	1.2	1.3
				1.4	1.4.1	1.4.2	1.4.3
				1.4.4	1.4.5	1.6	1.6.1
				1.6.2	1.6.4	1.7	1.7.1
Category 1 Cranes				8	8.1	8.1.1	a.b.c.d.
Boom Length	Test Load %			6.1.2	6.1.3	6.2	6.2.1
Hook				6.2.1.a	6.2.1.c	6.2.1.e	6.2.2
Main				6.2.3			
Aux							
Whip							
Other							
Hook Tram Measurements							
Main Hook							
Aux Hook							
Whip Hook							
Other							
Category 2 Cranes				Certification			
Hoist	Test Load %	Pounds		This is to certify that inspections and tests have been conducted in accordance with the procedures set forth in the current NAVFAC P-307. It is further certified that the crane identified above is satisfactory to lift its certified capacity at its rated radii.			
Main							
Aux							
Other							
Category 3 Cranes				Test Director (Signature)		Date:	
Hoist	Test Load %	Pounds		<i>Thomas J. Miller</i>		03/04/09	
				Inspector (Signature)		Date:	
Main				<i>Joe McSpencer</i>		03/04/09	
Aux				Inspector (Signature)		Date:	
Other							
Annual Certifications Since Hook NDT				Certifying Official (Signature)		Date:	
2							
Expiration Date							
Remarks							
<small>* For mobile cranes, list all test loads and configurations (e.g., over side/rear, boom extended/retracted, lifts on tires, traveling, etc.). If necessary, use figure 3-2.</small>							

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)



DISCUSSION NOTES

Exercise 1:

**AMISR**  
Item 7 – (alignment checks) below the dotted line should be marked N/A except for the required sixth annual inspection. The Certifying Official should identify that it is not marked and question if the required alignment checks have been performed and evaluated.”

Exercise 2:

**AMISR**  
Item 8b - . “The portion of item 8b below the dotted line should be marked as follows:  
If oil analysis is performed, required results must be documented in the crane history file and this paragraph marked Sat. If oil analysis is not performed, mark the first paragraph N/A and proceed to the second paragraph.  
  
The second paragraph is broken into two parts. FIRST, if the annual visual is possible it must be marked Sat or Unsat annually. If the disassembly option is selected then it should be marked N/A except on the 10th MISR cycle when the disassembly is performed.”

Exercise 3:

**AMISR**  
Item 9b, mechanical load brake is marked Satisfactory. If the crane has a mechanical load brake it will not also have an eddy current brake.

Exercise 4:

**AMISR**  
Item 16 – Wire rope inspection – Since one fractional dimension is listed and it appears to be a nominal dimension, the QUESTION should be asked if this is an actual measurement AND if it is the average of the several measurements required. Most wire rope is slightly larger than it’s nominal diameter and rope must be measured by using a caliper normally recorded to 1/1000 of an inch or at least to 1/64th. Additionally, measurements are to be recorded in the remarks section of the AMISR.

Exercise 5:

**AMISR**  
Item 17 – Load Chain - is marked Satisfactory and should be marked Not Applicable. The crane has wire rope established by a recorded measurement, not load chain.

Exercise 6:

**AMISR**  
Item 23 is marked Unsatisfactory, with no mark in the corrected column and is not listed on the UNSAT ITEM sheet.

Exercise 7:

**AMISR**  
Item 26 – Resistors – is marked N/A. This should raise a question. A crane this size and type almost certainly has resistors.

Exercise 8:

**AMISR**  
Items 9a and 28 should not both be marked as satisfactory. If the crane has a mechanical load brake it will not also have an eddy current brake. The Certifying Official should notify Crane Inspection and/or Engineering to clarify as to which type of brake is installed on this crane.

Exercise 9:

**AMISR**  
Page 10 - There is only the mechanical inspector's signature. Was there an electrical inspector, and if not, is the mechanical inspector qualified as a general inspector, able to sign for both inspections?

Exercise 10:

**AMISR**  
Page 11 - The Brake Data sheet has no tolerances for air gap or spring lengths. Because one or both of these measurements usually change as a brake wears, the acceptable ranges must be obtained from the manufacturer or developed by local engineering.

Exercise 11:

**CCIR**  
Item 22 is marked "Sat" should be "N/A".

Exercise 12:

**CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION**  
Item 1.4.3 is listed in the applicable paragraphs, but at the bottom of the form it indicates that 2 certifications have passed since the Non Destructive Test (NDT) of the hook.  
Paragraph 6.2.1.d is not listed, but the AMISR indicates that there is a load brake. This is a serious problem. If there is a mechanical load brake on the crane, it must be independently tested.  
The test load listed is exactly 125% of the capacity. This should at least raise the question whether or not the rigging gear, slings and shackles, were added to the test weights. It must be verified that the total load include the test weights and rigging gear. One other possibility is that the calculated test load is recorded here instead of the actual test load.

# NOTES

## LOAD CHART REVIEW

### INTRODUCTION TO LOAD CHARTS

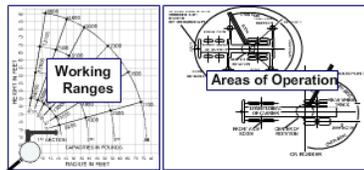
A good working knowledge of the OEM load chart is necessary to calculate safe lifting capacities. Generally, load charts list the maximum rated capacity of the crane for every permissible configuration, specify the crane's operational limitations, and set-up requirements for safe operation. Load charts also show configuration variables affecting the capacity of the crane at the time of the lift and identify factors influencing the crane's capacity, such as boom angle, boom length, load radius, deductions from gross capacity, configuration of the crane, and quadrants of operation.



Radius in Feet	Manual Fly Section Retracted							
	Boom Length in Feet							
	32	33	44	50	56	62	68	
12	50,000	47,000	44,000	41,000	38,000			
15	42,000					27,000	25,000	
20	31,800	<b>21,800</b>	<b>21,700</b>	<b>21,100</b>	20,000	19,000	18,000	
25	21,800	21,800	21,700	21,100	20,000	19,000	18,000	
30		15,500	15,500	15,500	15,500	15,500	15,500	
40			9,000	9,000	9,000	9,000	9,000	9,000

### PARTS OF A LOAD CHART

The load chart usually contains the following parts: rated capacities chart, notes section, range diagram, and a working area diagram.



### WHAT CAN WE LEARN FROM THE NOTES SECTION?

Before calculating the crane's capacity, the operator must read the general notes found on the load chart or in the load chart package. Load chart notes contain important information such as: deductions from listed capacities, allowable boom lengths, instructions for determining structural vs. stability limitations, wire rope type and reeving information, crane set up requirements, crane configuration requirements for travel and general crane safety reminders. Load chart notes serve as a safety refresher.

### RATED LIFTING CAPACITY CHART

The rated capacity chart is that part of the load chart that we reference to determine the crane's gross capacities. Gross capacities are listed for various boom lengths and load radii. The bold line, running between the listed capacities, separates capacities based on strength of materials where overload may cause structural failure and capacities based on stability where overload may cause the crane to become unstable and tip over. Capacities above the line are based on material strength. Capacities below the line are based on stability. Not all manufacturers use the bold line method of separating the listed capacities.

Radius in Feet	Manual Fly Section Retracted										Manual Fly Ext'd. '92
	Boom Length in Feet										
	32	33	44	50	56	62	68	71			
12	50,000	47,000	44,000	41,000	38,000						
15	42,000	40,000	39,000	36,000	33,000	27,000	25,000				
20	31,800	31,400	31,000	29,500	28,000	25,500	22,000	20,000	12,000		
25	21,800	21,800	21,700	21,100	20,000	19,000	18,000	17,000	11,500		
30		15,500	15,500	15,500	15,500	15,500	15,500	15,500	11,000		
40			9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	
50					5,700	5,700	5,700	5,700	5,700	5,700	
60							3,500	3,500	3,500	3,500	
70									3,100	3,100	
80										2,100	
89										1,500	

Some manufacturers use asterisks to mark the structural areas of the load chart.

RADII	US	BOOM LENGTH 33'			BOOM LENGTH 45'			BOOM LENGTH 57'		
		Angle	FRONT	360°	Angle	FRONT	360°	Angle	FRONT	360°
10	67	80,000*	80,000*	74	75,000*	75,000*	74	59,600*	59,600*	
12	63	76,100*	76,100*	71	73,000*	72,900*	72	55,000*	55,000*	
15	57	64,200*	63,200*	67	61,700*	61,700*	66	46,300*	45,700*	
20	46	45,800*	45,300*	60	46,100*	45,600*	60	35,300*	35,000*	
25	31	34,700*	34,400*	52	35,100*	34,800*	54	28,800*	27,800*	
30				43	27,800*	27,600*	47	22,800*	22,600*	
35				32	22,500*	22,400*	40	18,900*	18,700*	
40				15	17,600*	17,500*	32	15,800*	14,700*	
45							20	12,700*	11,700*	

\* Asterisks may be used to mark the structural areas of the load chart

### Rated Lifting Capacity Chart with Shaded Areas

30 FOOT JIB	JIB POINT RADIUS FEET	CAPACITIES IN POUNDS							JIB POINT RADIUS FEET	
		BOOM LENGTH FEET								
		110	120	130	140	150	160	170	180	
75*	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	75*
80	40,000	40,000	40,000	40,000	40,000	40,000	40,000	39,200	39,200	80
85	39,400	39,400	39,400	39,400	39,400	39,400	39,400	38,600	38,600	85
90	36,400	36,400	36,400	34,900	34,500	33,900	33,600	33,100	33,100	90
95	33,700	33,700	33,700	32,200	31,800	31,200	30,900	30,400	30,400	95
100	31,300	30,700	30,500	29,900	29,400	28,800	28,500	28,000	28,000	100
105	29,200	28,600	28,400	27,700	27,300	26,700	26,400	25,800	25,800	105

Shaded areas indicate structural or strength of materials lifting areas

In this example shaded areas identify capacities based on structural strength.

40 FOOT JIB	JIB POINT RADIUS FEET	CAPACITIES IN POUNDS							JIB POINT RADIUS FEET	
		BOOM LENGTH FEET								
		110	120	130	140	150	160	170	180	
80	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	80
85	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	85
90	30,000	30,000	30,000	30,000	30,000	29,300	29,300	29,300	29,300	90
95	29,600	29,000	28,800	28,800	28,100	27,700	27,700	27,700	27,700	95
100	27,700	27,100	26,800	26,200	25,700	25,700	25,700	24,900	24,300	100
105	24,300	23,700	23,500	22,800	22,400	21,800	21,500	21,000	21,000	105

### WHAT IS GROSS CAPACITY?

What can be safely lifted on the hook? To answer that question gross capacity. Gross capacity is the value shown on a manufacturer's load chart. These values are not the loads that can be suspended from the hook. To answer this question you need to know the gross capacity of the crane.

RADII	US	BOOM LENGTH 33'			BOOM LENGTH 45'			BOOM LENGTH 57'		
		Angle	FRONT	360°	Angle	FRONT	360°	Angle	FRONT	360°
10	67	80,000*	80,000*	74	75,000*	75,000*	74	59,600*	59,600*	
12	63	76,100*	76,100*	71	73,000*	72,900*	72	55,000*	55,000*	
15	57	64,200*	63,200*	67	61,700*	61,700*	66	46,300*	45,700*	
20	46	45,800*	45,300*	60	46,100*	45,600*	60	35,300*	35,000*	
25	31	34,700*	34,400*	52	35,100*	34,800*	54	28,800*	27,800*	
30				43	27,800*	27,600*	47	22,800*	22,600*	
35				32	22,500*	22,400*	40	18,900*	18,700*	
40				15	17,600*	17,500*	32	15,800*	14,700*	
45							20	12,700*	11,700*	

45,800 Gross Lifting Capacity

### WHAT IS NET CAPACITY?



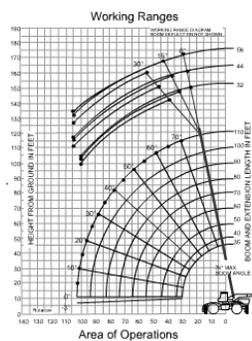
Net capacity is the value shown on the manufacturer's load chart, minus all deductions. To calculate net capacity, subtract the effective weight of all deductions from the gross capacity. Common deductions include the weight of attachments including extensions, swing-away jibs, and auxiliary boom nose sections. The same attachments may have different effective weights in the stowed and erected position. The effective weight of these attachments is listed in the load chart notes, in an area titled weight reductions for load handling devices.

### COMMON DEDUCTIONS

The weight of attachments, such as swing away jibs, stowed or erected, and the weight of auxiliary boom heads and rooster sheaves, must be deducted from gross capacity. The weight of the hooks, blocks and overhaul ball are also deducted from the gross capacity. The crane may be equipped with standard or optional hook blocks having different weights. Hook block weights and capacities should be stamped on each hook block. Be aware that some manufacturers require the weight of excess wire rope, not necessary for a lift, to be deducted.



### RANGE DIAGRAM

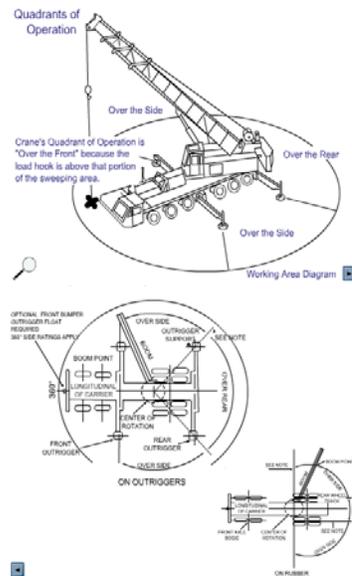


Range diagrams are used for planning lifts. You can use them to determine the configuration of the crane needed for a particular job. By laying out the geometry of the job on the diagram, the operator can determine the boom length, boom angle, jib length and jib offset required for the lift. When loads must be placed above grade, the boom-tip height must allow for clearance between the boom tip and the load blocks, and the height of the load including the slings. When loads must be set a certain distance in from the edge of a roof, the length of jib and necessary jib offset are easily determined by using the range diagram. It may be used to determine the boom angle of telescopic booms, when the boom is only partially extended and the radius is known. The range diagram may also be used to identify the allowable clearances between the load blocks and boom tip.

### WORKING AREA DIAGRAM

Another important part of the load chart is the working area diagram. Crane stability and capacity will vary as the load moves from one quadrant of operation to another. Because the crane's capacity is different in each quadrant of operation, it is important to match the load chart to the quadrant(s) the crane will be working in and through.

Working Area Diagram



### CATEGORY 4 QUADRANTS

Always check OEM documentation for the location of quadrants on your machine. These are examples of the variety of crane and stabilizer placements on category 4 machines.

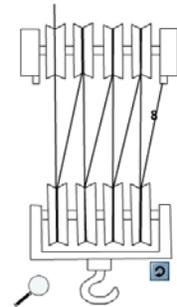


### CAPACITY LIMITING FACTORS

The lifting capacity of a crane may be limited to the rated load of the hook and block installed on your crane. Hook block capacity information is normally located on side of block.

### PARTS OF LINE

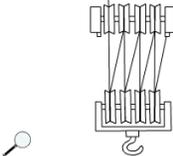
Before making any lift, you must ensure that the crane has sufficient net capacity to lift the load and is reeved with enough parts of line to lift the load without exceeding the rated load of the hoist wire rope. The number of parts used may limit lifting capacity. Count the number of lines suspending the load. In this example we have 8 parts of line between the hoisting sheaves and the hoist block sheaves.



### WIRE ROPE CAPACITY

The rated load of the crane's hoist depends on the wire rope size, type, and the number of parts of line. The allowable line pull is found in the crane's load chart. In this example the allowable line pull of each part of the wire rope is 12,920 pounds.

Hoists	Cable specs.	Permissible Line pulls
Main & Aux. Model 30	3/4" (19 mm) 18 x 19 Class or 35 x 7 Rotation Resistant Min. Breaking Str. 64,800 lbs.	12,920 lbs.
Main & Aux. Model 30	3/4" (19 mm) 6x37 Class EIPS IWRC Special Flexible Min. Breaking Str. 58,800	12,920 lbs.



Multiply the rated load by the number of parts:

$$\begin{array}{r} 12,920 \text{ lbs.} \\ \times \quad 8 \text{ parts} \\ \hline 103,360 \text{ lbs.} \end{array}$$

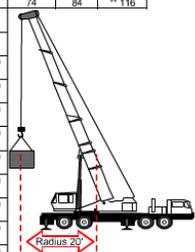
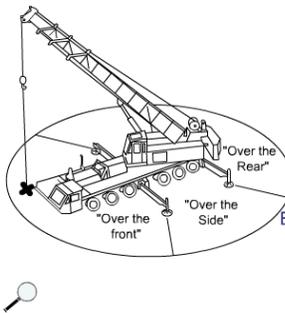
### CALCULATING WIRE ROPE CAPACITY

To find the capacity of the crane's wire rope, multiply the rated load or line pull by the number of parts. In this example we multiply the rated load of 12,920 pounds by eight parts. Eight parts of wire rope have a rated load of 103,360 pounds. If the hook block capacity is less than the rated load of the wire rope, the hook will be the limiting factor.

### LOAD RADIUS

The load radius is the horizontal distance measured from the center of rotation of the crane center pin, to the center of the hook. Load radius can be established by centering the hook over the load and referring to the crane's radius indicator. For fixed boom lengths, radius can be calculated using boom angle and a load chart. On telescoping boom cranes, boom deflection can increase the radius. On critical lifts the radius should be measured. Monitor the radius throughout the lift.

ON OUTRIGGERS FULLY EXTENDED - OVER REAR						
Radius in Feet	Boom Length in Feet					
	34	40	44	54	64	84
10	100,000 (70)	74,000 (73)	72,000 (76)			
12	90,000 (65.5)	70,000 (70)	67,500 (73.5)	64,000 (76.5)		
15	72,000 (61)	63,700 (65.5)	61,000 (69)	55,000 (73)	44,700 (76)	
20	53,000 (50.5)	52,200 (67.5)	49,800 (62)	44,000 (67.5)	37,900 (71)	
25	41,000 (38.5)	41,000 (48)	41,000 (54)	36,300 (61.5)	31,900 (66)	
30	29,690 (21.5)	29,690 (37.5)	29,690 (45)	29,690 (55.5)	27,000 (60.5)	
35		22,650 (23)	22,650 (34.5)	22,650 (48.5)	22,650 (55)	
40			18,090 (19)	18,090 (41)	18,090 (49)	
45				14,840 (31.5)	14,840 (42)	
50				12,330 (17.5)	12,330 (35)	
55				10,440 (26)		

### QUADRANTS OF OPERATION

The crane's working area is divided into areas called quadrants of operation. In pre-planning the lift, you must know which quadrant the load will be lifted from, carried through, and placed in. Knowing the load path is important for selecting the right crane for the job.

### CONSEQUENCES OF OVERLOADING

Exceeding the crane's rated capacity may result in one of two consequences, loss of stability or structural failure.



Loss of Stability



Structural Failure

### LOSS OF STABILITY

When a crane loses stability the tipping force of the load overcomes the counteracting load of the crane. When tipping begins, especially with loads high in the air, it is very unlikely that the crane operator can do much to prevent overturning. As the crane begins to tip, the load radius increases. As the load radius increases the capacity of the crane decreases rapidly. This happens so rapidly that recovery is nearly impossible. It is critical for you the crane operator to know the safe capacity of your crane at all times!

### STRUCTURAL FAILURE

Cranes can fail structurally if the rated capacity is exceeded. Structural failure can occur before any signs of tipping, when capacities in the strength area of the load chart are exceeded. Structural failure is not limited to total fracture of a component. It includes hidden or less visible damage such as cracking, bending, or twisting of any component. It is difficult to predict which component in a crane may fail structurally when overloaded. Loss of stability and structural failure from overloading the crane are avoidable when you understand and follow the crane capacity or load chart.

# NOTES

[LOAD CHARTS REVIEW MODULE EXAM](#)

*Online exam questions may appear in a different order than those listed below.*

1. Available jib offset would be listed in which part of the load chart?
  - A. Notes
  - B. working area diagram
  - C. rated lifting capacities
  - D. range diagram
  
2. The maximum load that can be lifted without losing stability would be listed in which part of the load chart?
  - A. Notes
  - B. working area diagram
  - C. rated lifting capacities
  - D. range diagram
  
3. General crane safety reminders would be listed in which part of the load chart?
  - A. Notes
  - B. working area diagram
  - C. rated lifting capacities
  - D. range diagram
  
4. Gross capacities would be listed in which part of the load chart?
  - A. Notes
  - B. working area diagram
  - C. rated lifting capacities
  - D. range diagram
  
5. Quadrants of operation would be listed in which part of the load chart?
  - A. Notes
  - B. working area diagram
  - C. rated lifting capacities
  - D. range diagram
  
6. Overloading a crane may result in which of the following consequences?
  - A. damaged wire rope
  - B. tipping (loss of stability)
  - C. boom failure
  - D. overturning
  - E. all of the consequences listed

7. Maximum height a load may be hoisted would be determined with which part of the load chart?

- A. Notes
- B. working area diagram
- C. rated lifting capacities
- D. range diagram

8. Wire rope type and reeving information would be listed in which part of the load chart?

- A. Notes
- B. working area diagram
- C. rated lifting capacities
- D. range diagram

9. Possible capacity loss due to quadrant changes could be determined by checkin which parts of the load chart?

- A. rated lifting capacities and Noted pages
- B. Noted pages and range diagram
- C. working area diagram and rated lifting capacities chart
- D. Rand diagram and working area diagram

10. Deducting the weight of all attachments, hooks, blocks, rigging and lifting gear from the capacities listed in the load chart provides the operator with \_\_\_\_\_.

- A. reduced capacities
- B. safety margins
- C. net capacities
- D. gross capacities

## LOAD TESTING CATEGORY 1 CRANES

### PORTAL CRANE NO-LOAD TEST

Perform the no-load test on a portal crane to check all functions. Check all hoist and boom primary upper and lower limits. Check secondary upper and lower limits (if installed) by carefully moving the boom or hoist slowly through each primary limit switch, using the limit switch bypass, continuing into the secondary limit switch. Check emergency brakes on wire rope drums where installed, by simulating a fault.



Check the boom drum pawl for proper engagement with ratchet gear and limit switch. Check the pawl limit switch, if installed, for operation. Some pawl limit switches allow the hoist to raise but not lower. Others cut out both directions. Check that the boom hoist motor shuts off, the brakes engage, and indicator lights operate correctly.

Check the Rotation Lock: Engage the rotation lock and inspect to ensure full engagement. Check that the rotation lock limit switches (clockwise and counterclockwise) prevent rotation. Operate the rotation lock bypass (clockwise and

counterclockwise) and ensure proper operation. Use only enough power to check operation of bypass. Limit switches may be operated manually to check for correct operation in lieu of engaging rotation lock. Ensure rotation lock is disengaged prior to continuing to the next step of this test. Check Rotation: Rotate clockwise and counterclockwise with boom at minimum radius.



The no-load test for portal cranes also includes no-load travel and dead-man controls. With the boom over the front, centered between the crane rails and with the boom dog engaged, travel in one direction a minimum of 50 feet. Repeat with the boom rotated over the opposite end. Dead-man controls are tested by engaging each controller at the slowest practical speed and releasing the dead-man control. Power to the control should be interrupted and the motion should stop.

### PORTAL CRANE LOAD TEST

The nominal test load for a portal crane is 125% (+5/-0%) of rated capacity.

The load test for portal cranes includes the following special requirements in addition to the standard tests in Appendix E. Variable rated cranes shall be tested at the maximum radius for the load. The stability test is for balanced deck design cranes only. Balanced deck design cranes are portal cranes with large diameter roller assemblies and center pin assemblies. This test is done during the static and dynamic load test observing for clearance between the rollers and the upper and lower roller rails. If no clearance is observed, stability is satisfactory. If clearance is observed, follow the specific procedure outlined in Appendix E. Main and boom hoists, rotate, and travel load tests are performed using the maximum test load for the crane. For the boom hoist tests, the test load and radius shall produce the maximum line pull. This may require a different test load. Typically, this is done at maximum radius for maximum load.



### PORTAL CRANE HOIST LOAD TEST

Main and boom hoist static test: Raise the test load to clear the ground and hold for 10 minutes. Do not allow pawl (dog) to carry the load. Observe for lowering of the test load, which may indicate equipment malfunction. If either hoist has primary and secondary holding brakes, where each brake is designed to individually hold the load, other tests shall be performed in lieu of a single 10 minute hold test.



Hoist dynamic test: Raise and lower the load. Stop the load during hoisting and lowering. Ensure the crane operates smoothly through the range, holds the load when stopped, and the dynamic braking functions properly. New wire rope shall be tested through its maximum working length before being put into service. This may be accomplished during either the dynamic or static tests. To test the boom hoist, start from maximum radius with load attached; raise the boom to minimum radius and then lower it back to maximum radius. Ensure the crane operates smoothly through the range, holds the load when stopped, and the dynamic braking functions properly.

The hoist foot brake and boom foot brake tests (hydraulic or mechanical), are designed to test the ability of the foot brakes to stop the lowering motion. In both tests, hoist the test load a few feet above the ground. For the boom test, have the boom near maximum radius. Lower the test load at slow speed with controller in the first control point. Apply the foot brake. The lowering motion shall stop. These tests are not applicable to load-sensitive reactor type hoist controls.

The hoist loss of power and boom loss of power tests, or 'panic' tests, are designed to test the reaction of the applicable hoisting unit in the event of power failure during a lift. In both tests, hoist the test load about 10 feet above the ground. For the boom test, have the boom near maximum radius. Lower test load, for the hoist panic test, or the boom, for the boom panic test, at slow speed and, with controller in the slow lowering position, disconnect the main power source by pushing the main power stop button, then return the controller to neutral position. The test load or boom shall stop lowering when the controller is placed in the neutral position. These tests are only done on cranes with powered down hoists. Cautions apply (see Appendix E) and may require engineering involvement.

### TRAVEL AND ROTATE LOAD TESTS

The rotation test is done at maximum radius, rotated left and right, 360 degrees, if possible, or at least two complete revolutions of the swing pinion. Rotate brakes shall demonstrate ability to stop the rotating motion in both directions in a smooth, positive manner. The travel test with the boom over-the-side is conducted with the boom at maximum allowable radius and positioned perpendicular to the crane rails as in P-307 Appendix E. With the boom dog engaged, travel in one direction a minimum of 50 feet. Repeat with boom on opposite side where space and conditions permit.



**CAUTION:** Use very slow travel speed to ensure track and supporting foundation are sound and the travel area is free of obstructions. The travel test with the boom over-the-front is done in the same manner over each end of the crane. In each travel test, operate the controller through normal operating speeds. The crane shall accelerate, decelerate, and stop smoothly.

### PORTAL CRANE TEST WRAP-UP

Test auxiliary and whip hoists and emergency drum brakes using the maximum test load for the maximum radius of the crane. Repeat the stability test (for balanced deck design cranes only).



### MOBILE CRANE LOAD TESTS

Specific Category 1 cranes covered are locomotive, crawler, cruiser or rough terrain, truck, and crash. Category 4 crane included in this procedure are commercial truck-mounted, articulating-boom cranes and all cranes mounted on automotive truck chassis.



### PRE-TEST PREPARATION

Select a test site that is firm, level, and free of ground obstructions. Crane set up: Extend outriggers or stabilizers as specified by the OEM. For most truck and cruiser cranes, the crane carrier shall be raised sufficiently to completely unload the tires. Level the crane as required by the OEM load chart. Rotate the boom 90 degrees from the longitudinal axis of the crane carrier at the minimum working radius. Special Precautions: It is strongly recommended to attach guy wires to the crane or place cribbing under the counterweight to prevent possible overturning in the event of wire rope or mechanical failure. Test personnel shall remain alert to wind, weather, and visibility conditions that may jeopardize the safe performance of the tests.



### MOBILE CRANE TESTING

The nominal test load shall be 105% of rated capacity for the crane's configuration considering reeving, boom length, etc. The rated capacity shall be the capacity shown on the posted load chart. The rated capacity may be limited by wire rope line pull or parts of line if the crane is not fully reeved. The test load must include the weight of, or deduction values for the hook, block, slings, and ancillary lifting devices and for some cranes, excess wire rope. NOTE: Deductions shall be subtracted from the nominal test load in order to determine the test weights required. Follow OEM load chart instructions for deduction values. Ancillary equipment such as a swing-away extension or jibs shall be tested during the annual load test.



### NO-LOAD TESTS FOR MOBILE CRANE

Test all functions through their full range of motions. Check all limit switches and bypasses where applicable. Check LMI functions and all no-load data such as radius, boom length, etc. After lowering the hook, check that the wire rope drum is packed tightly before the load test. This is especially important for smooth drums! For hydraulic cranes, extend and retract telescoping boom fully. Hydraulic fluids should be brought up to normal operating temperature before the load test. The no-load test for hydraulic cranes will normally accomplish this. Additional no-load operation may be required. Torque converter temperatures should be in the normal range before doing travel tests.



### MOBILE CRANE LOAD TEST

The mobile crane load test consists of two parts: a maximum certified capacity test and a load moment test. Beginning with the main hoist, do the static test with maximum load, with boom at minimum radius, with boom and load hoist pawls or dogs disengaged. For telescoping booms, the static and dynamic tests are performed with boom fully retracted. Excessive layers of wire rope on the drum, on some cranes, may prevent lifting the test load. If the crane has the same maximum capacity at extended boom lengths, perform the test with the boom extended. If the crane cannot lift the test load, check the OEM's allowable line pull for the particular model hoist and layers of rope. If allowable line pull or available torque is the limiting factor, reduce the test load and adjust rated capacity based on the allowable line pull limitation, and perform the required test. The crane will then be certified based on the reduced test load.



### MAXIMUM CERTIFIED CAPACITY TEST

The test load shall be 105% of the maximum certified capacity of the crane. Determine the maximum permissible radius for the maximum certified capacity.



Perform the test at the maximum boom length for this capacity and radius. Raise the test load using the hoist. Lower the test load and test the ability of the brake to control, stop, and hold the test load (10 minute hold). Other tests and conditions may apply. Review NAVFAC P-307, Appendix E for details. Observe for any lowering that may occur, which may indicate a malfunction of boom or hoisting components, brakes, or outriggers.

With the test load raised, rotate the hook 360 degrees clockwise and counter-clockwise to check bearing operation. If the size of the test load precludes a full 360 degree rotation of the hook, perform the hook rotation test during the load moment test. Operate the boom from maximum radius to minimum radius. Repeat the test, operating the boom from minimum radius to maximum radius for the load applied

*Note: Due to the number of layers of wire rope on the drum, some cranes may not be able to lift the test load per the OEM's load chart.. If the crane cannot lift the test load, check the OEM's hoist line pull for the particular model hoist and layer of rope. If hoist line pull (available torque) is the limiting factor, reduce the test load based on the hoist line pull limitation and perform the required test. Certify the crane based on the reduced test load (i.e., certified capacity is test load divided by 1.05). If the crane cannot lift the reduced test load, verify that the system hydraulic pressure and relief valves are set within OEM specifications. If the settings are within specification, contact the OEM.*

## LOAD MOMENT TEST

### Test Configuration:

- Boom length - shortest length where all sections are partially extended, but not less than 50% total powered boom length (or latching section boom length).
- Maximum radius - the radius that creates the maximum load moment that will safely clear the outriggers/stabilizers/carrier through the complete swing range.
- The test load shall be 105% of OEM load chart capacity at this boom length and radius.

*Note: For the purposes of this test, load moment is the product of capacity multiplied by radius. Cranes equipped with multiple boom modes must have multiple load charts checked to ensure the maximum load moment is selected.*

Telescopic Component Slippage. Raise the test load using the hoist. Operate the boom from maximum radius (as defined above) to minimum radius for the load applied. Hold the load for 5 minutes without use of controls by the operator. Observe for any lowering that may occur, which may indicate a malfunction of boom or hoisting components, brakes, or outriggers. Lower the boom from minimum radius to maximum radius (as defined above) before proceeding to the next test.



Outrigger/Stabilizer Component Slippage. Swing the test load at slow speed through the complete swing range as allowed by the OEM, and apply the brake periodically during rotation. The brake shall demonstrate its ability to stop the rotating motion in a smooth, positive manner. Hold the load with the boom positioned over (or near as allowed by OEM) each outrigger/stabilizer for 5 minutes (holding over the center front outrigger/stabilizer is not required). Observe for any lowering that may occur, which may indicate a malfunction of boom or hoisting components, brakes, or outriggers. Swing the crane in the opposite direction through the complete swing range as allowed by the OEM.

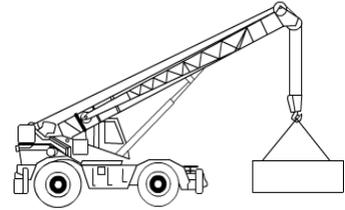
### Notes for telescopic and outrigger/stabilizer component slippage tests:

1. The significance of any lowering shall be evaluated by the activity engineering organization depending on operating requirements and safety.
2. For cranes equipped with outrigger locking devices but where activity operating procedures permit operation without the use of the locking devices, this test shall be performed with the locking devices disengaged.
3. If a latching boom crane's telescoping cylinder has the capability to telescope, retract or hold the boom while unpinned under load, it shall be tested by repeating the telescopic component slippage test at 105% of the maximum telescoping/retracting/unpinned holding capacity with the boom unpinned. However if the only function of the telescoping capacity is to extend or retract boom sections, ancillary equipment, or rigging hardware, and no

loads are telescoped, then the telescoping cylinder does not require a telescopic component slippage test.

**“On-Rubber” (Free-Rated) Load Test.**

Allowable “on-rubber” rated capacity for over the side lifting for cranes equipped with outriggers shall not exceed 60% of the OEM’s load chart values per paragraph 11.3. For those cranes, testing over the side “on-rubber” is not required. (For rubber tired cranes without outriggers, contact the Navy Crane Center). See section 11 for allowable “on-rubber” (free rated) capacities and other stability information for used and altered cranes. Check the stability and operation of crane, carrier, wheels, tires, brakes, etc., under load by performing the following tests, when lifting without outriggers and/or traveling with the load are permitted at the activity for the type of crane being tested.



Notes: Some cranes have different ratings for stationary lifts and for traveling with a load. Each allowable configuration shall be tested.

a. Maximum Certified On-Rubber Capacity.

1. Hoist 105% of the maximum certified on-rubber capacity at the minimum possible radius over the rear (or over the front as required by the OEM). Slowly boom down to the maximum radius for the maximum certified capacity. Observe for any lowering that may occur, which may indicate a malfunction of boom or hoisting components, brakes, or wheels/tires/axle components.
2. Rotate through the on-rubber working arc as allowed by the OEM. Observe for any lowering that may occur, which may indicate a malfunction of boom or hoisting components, brakes, or wheels/tires/axle components.
3. Travel a minimum of 50 feet with the test load over the rear (or front as required by the OEM) with the boom parallel to the longitudinal axis of the crane carrier. Observe for any lowering that may occur, which may indicate a malfunction of boom or hoisting components, brakes, or wheels/tires/axle components.

*Note: Hydraulic boom crane and lattice boom crane load test requirements are similar in some ways (e.g., rotate, hoist), however, differences exist with other tests. Refer to NAVFAC P-307, appendix E, section 5.5 for lattice boom crane test details.*

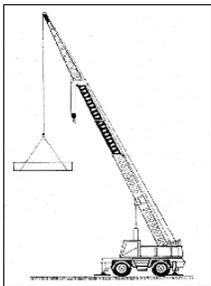
### TEST PROCEDURE FOR CATEGORY 4 CRANE

Articulating boom machines shall be tested in accordance with P-307 Appendix E. This procedure follows the mobile crane pre-test preparation and test load criteria. For conventional boom machines, follow OEM test procedures. Where no procedures are provided by the OEM, procedures must be developed by the activity engineering organization using Appendix E as a guide. The test director must thoroughly review the crane's set-up requirements and allowable working quadrants. Many Category 4 cranes require that the tires are NOT free of the ground when properly set up on outriggers or stabilizers. Test category 4 cranes at **105%** unless the crane manufacturer prohibits overload testing. When the OEM prohibits overload testing, down-rate the crane to allow the **105%** load test at the original rated capacity.



### SPECIAL MOBILE CRANE TEST PROCEDURES

Special testing procedures are required after change or repair of tires. For cranes with on rubber lift capability, travel the crane with no load on the hook, a minimum of 100', forward and reverse, with the counterweight positioned over the affected tire, and the boom at minimum radius or as required by the OEM. Use this method only when allowed by the OEM. Use extreme caution moving a crane with the boom off center and at a minimum radius. Some mobile cranes may become unstable in this position, especially when traveled over uneven surfaces.



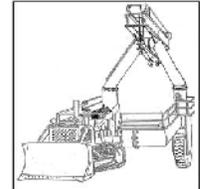
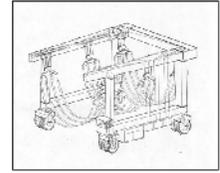
### AUXILIARY HOOKS AND ANCILLARY EQUIPMENT

Test procedures for ancillary equipment, auxiliary hoists, whip hoists, ancillary equipment used without procedures, and line pull test are outlined for various types of cranes in NAVFAC P-307, appendix E.

### BOAT HOISTS

Boat hoist are load tested at **105%** of the rated capacity unless the OEM does not allow load testing over 100% of capacity. On certain types of mobile boat hoists that use deck fittings for lifting the test load, ensure the deck fittings are aligned in the plane of the sling. Lift the test load only high enough to perform the required tests. Static Test:

Raise the load approximately 1 foot and hold for 10 minutes. Observe for any lowering that may occur, which may indicate a malfunction of the hoist components or hoist brakes. Hoist Dynamic Test: Raise and lower the test load at normal operating speeds and observe smooth control. Hoist Brake Test: Test the ability of the brake to control and stop the load. Travel Test: Travel the self-propelled boat hoist a minimum of 50 feet in each direction. While traveling steer right and left. At a slow speed, apply the foot brake. For towed boat hoists tow a minimum of 50 feet.



### BARGE-MOUNTED MOBILE CRANES

Mobile cranes certified for shore use may be temporarily mounted on barges and must be tested and re-certified using the following procedure. Barge stability calculations must be done and reduced load charts, based on maximum list and trim, shall be established by the activity engineering organization. These must be approved by the certifying official. The certifying official shall prescribe the test conditions and precautions, such as, limit of wind velocity, list, trim, etc. The following conditions, as a minimum, shall be adhered to. A marine list and trim indicator shall be installed in the operator's cab. Maximum list and trim shall not exceed three degrees under test conditions. The crane carrier shall be secured to barge deck pad-eyes or connectors with tie-downs at each crane outrigger or corner. Tie-downs shall have some slack when the crane is fully raised on outriggers. The crane shall be load tested and re-certified on the barge using **105** (+5/-0) percent of the reduced load chart capacities. Note: When removed from the barge, the crane's land-based certification continues in effect.



### FLOATING CRANE LOAD TESTS

Load and no-load tests for floating cranes are done in the same manner as portal cranes for all functions that apply. Use caution when rotating loads over water. Ensure the floating crane has adequate draft readings per design data during the initial load test. Monitor the radius during the test to stay within the allowable radius. Where space permits, the parking brake must prevent rotation when applied with the boom at 45° from the centerline of the barge. Hold for 10 minutes with brake applied. Additional no-load and load tests for Dravo 60-Ton floating crane are done to verify the proper operation of the backup brake system in case of pneumatic clutch system failure. See Appendix E of the P-307 for specific procedure.



### TESTING WHE NOT USED FOR LIFT-CRANE SERVICE

Locomotive, crawler, truck, and cruiser cranes that are used for clamshell, dragline, magnet, pile driving, or other non-lift crane work shall be tested at the maximum safe working load permitted for the wire rope being used. Test in all working motions except travel. Attachments such as buckets, magnets, etc., may be removed for testing wire rope. No test is required after reassembly. Retesting is not required when an end attachment is changed from the original connection such as changing from clamshell to dragline during the certification period.

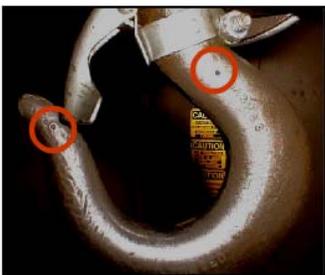


### SPECIAL TESTING SITUATION

Special situations may require special tests. Newly acquired and previously used locomotive, truck, cruiser, crash and crawler cranes may require stability testing and calibration for two reasons. when the manufacturer's load chart and stability data are no longer available. When the acquiring activity suspects that previously performed alterations may affect stability. In addition, all locomotive, truck, cruiser, crash, and crawler cranes are tested for stability after alterations are performed that affect the original stability ratings. Stability testing is done to the industry standard, SAE J765, Crane Load Stability Test Code.

### AFTER THE LOAD TEST

After the test, check all hooks for throat spread, complete and sign the Crane Condition Inspection record and complete and sign the Certification of Test and Inspection record.



### CHECKING HOOK THROAT SPREAD

After the test, check all hooks for hook throat spread. Measure between the tram marks. Compare to the baseline measurement. Replacement criteria requires discarding any hooks showing an increase in the throat opening of more than five percent from the base measurement.

### DOCUMENTING THE TEST

The condition inspector shall carefully post-inspect the items identified on the CCIR and look for any damage that may have occurred during the test. When completed, all documentation shall be signed and dated by the inspectors and test directors.

### COMPLETING THE CERTIFICATION PROCESS

The certification package is submitted to the certifying official for approval and signature. Completed records are filed in equipment history file. The certification card or tag is posted in the crane cab, on the control station, or in a conspicuous location near the crane.

# NOTES

LOAD TESTING CATEGORY 1 CRANES MODULE EXAM

*Online exam questions may appear in a different order than those listed below.*

1. Which of the following crane types is not tested as a mobile crane?
  - A. truck
  - B. crash
  - C. cruiser (rough terrain)
  - D. locomotive
  - E. Traveling wall crane
  
2. When performing a stability test on portal cranes with a balanced deck design, a measurement is taken...
  - A. at the roller path, between the rollers and the roller path surface (race)
  - B. from the boom tip to the ground, measured at no load and at full load
  - C. between the ground and mark on the test weights
  - D. between the travel wheels and the rails
  - E. stability tests are not required for portal cranes
  
3. Portal cranes are load tested at what percentage of their capacity?
  - A. 110% +5 -0%
  - B. 110% +5 -5%
  - C. 125% +5 -0%
  - D. 125% +5 -5%
  
4. The auxiliary and whip hoists on a portal crane are tested in the same manner as the main hoist.
  - A. True
  - B. False
  
5. When a mobile crane is equipped with outriggers, they must be used to take most of the weight of the crane from off the tires.
  - A. True, it is not required to completely unload the tires from the ground
  - B. False, the tires and crane must be completely supported by the ourtriggers
  
6. When working with mobile cranes, free-rated-capacity means...
  - A. the amount of weight which may be lifted without the use of outriggers
  - B. a weight that can be lifted and rotated 360 degrees while on outriggers
  - C. a weight that can be lifted and rotated over the sides only on outriggers
  - D. the amount of weight which will cause instability on outriggers
  - E. none of the above

CERTIFYING OFFICIAL STUDENT GUIDE

7. A boom foot brake test is performed with the boom near \_\_\_\_\_.

- A. minimum radius
- B. the ground
- C. maximum radius

**CATEGORY 1 EXERCISE**

*You will need a copy of the Mobile\_Crane\_Certification\_Package.pdf*

**DIRECTIONS**



## Certifying Official

### Cat 1 Crane Certification Package Review

- **Directions**
- Exercise 1
- Exercise 2
- Exercise 3
- Exercise 4
- Exercise 5
- Exercise 6
- Exercise 7

**Mobile Crane Certification Package Review**

As the certifying official, you received the certification package Mobile Crane Certification. The crane is a Grove RT740B:

- equipped with a 40-ton main block
- reeved with 4 parts of wire rope, a 7-1/2-ton whip hook reeved over an auxiliary boom nose, and a 32-foot fixed-length extension.
- The rated capacity (or maximum line pull) of one part of wire rope is 12,920 pounds for both the main and auxiliary hoists.

Included in the package are the MISR, the CCIR , Load Test Certification form and Test Calculations.

For this exercise, you will review the certification package submitted for your signature. Review the package for errors or questionable items. Determine if the certification is ready to be signed or if there are errors in testing or certification paper work, which may delay certification.

After reviewing the package, continue with the exercise to verify your review.



**Print PDF**

EXERCISE 1



# Certifying Official

## Cat 1 Crane Certification Package Review

**Directions**

- Exercise 1
- Exercise 2
- Exercise 3
- Exercise 4
- Exercise 5
- Exercise 6
- Exercise 7

<b>MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 CRANES</b>										
SHEET 8 OF 17										
Crane 82-00012										
Item No.	Inspection Type			Items to be Inspected	Maintenance Inspection Specification	System Inspected	Condition			
	A	B	C				S	U	C	NA
49		X	X	Slewing Ring Bearings	Inspect expelled lubricant for evidence of metal flakes or metal or plastic particles. Inspect fasteners for proper tightness. For portal and floating cranes, measure and record internal axial clearance (thrust direction) between bearing rollers (balls) and races. Refer to OEM's literature for method and acceptance / rejection criteria. For mobile cranes, follow OEM recommendations for bearing wear inspection. During operation, listen for abnormal noise and inspect for vibration.		X			

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

[Print PDF](#)



EXERCISE 2



# Certifying Official

## Cat 1 Crane Certification Package Review

**Directions**

Exercise 1

● Exercise 2

Exercise 3

Exercise 4

Exercise 5

Exercise 6

Exercise 7

MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 CRANES											
SHEET 10 OF 17											
Crane 82-00012											
Item No.	Inspection Type			Items to be Inspected	Maintenance Inspection Specification	System Inspected	Condition				
	A	B	C				S	U	C	NA	
52		X	X	Wire Rope, Fastenings, and Terminal Hardware	Thoroughly inspect the entire length of running ropes and standing ropes. The depth and detail of the inspection shall be that necessary to ensure that the entire rope is acceptable with special attention paid to areas of expected wear or damage, and to areas not normally visible to the operator during operation or pre-use check. During the inspection, the wire rope shall be payed out as far as possible. For sections that can not be spooled off the drum, visual inspection of the wire rope on the drum is sufficient. Where it is not possible to pay out to the lowest layer, the crane shall not be used for applications where the uninspected rope (i.e., covered layers) would be spooled off the drum under load. The first layer of wire rope must be properly reinstalled on the drum to provide adequate support for the upper layers. Remove wire rope dressing from selected areas exposed to significant wear, exposure, and abuse. Dimensional (diameter) measurements shall be taken at several places over the length of the rope. Record dimensions in the "remarks" block. Expose and examine sections in contact with equalizer sheaves and saddles or where corrosion may develop because of poor drainage. Lubricate areas after inspection. Inspect for defects noted below and proper lubrication. Inspect poured sockets, wedge sockets, swage fittings, eyes, swivels, trunnions, and fasteners for undue looseness, wear, cracks, corrosion, and other damage. Undue looseness in poured sockets is defined as looseness or evidence of slippage of wires in the securing material, evidence of deterioration of the securing material, looseness of wire rope strands or wires adjacent to the socket or any looseness resulting from cracks or other defects in the basket. Evidence of looseness between the securing material and the basket resulting solely from seating of the material in the basket is acceptable. Drum end fittings need only be disconnected or disassembled when experience or visible indications deem it necessary. The Federal Specification for wire rope is RR-W-410. Note: Inspection of extend/retract cables internal to telescoping booms may be limited to inspection through boom inspection ports. Disassemble at every second type "C" inspection for complete inspection of cables.		X				

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

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EXERCISE 3



## Certifying Official

### Cat 1 Crane Certification Package Review

**Directions**

Exercise 1

Exercise 2

● Exercise 3

Exercise 4

Exercise 5

Exercise 6

Exercise 7

#### MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 CRANES

SHEET 11 OF 17

Crane 82-00012										
Item No.	Inspection Type			Items to be Inspected	Maintenance Inspection Specification	System Inspected	Condition			
	A	B	C				S	U	C	NA
53	X	X	X	Hoist Blocks and Hooks	Inspect hoist blocks, cheek plates, swivels, trunnions, and lubrication fittings for damage or deterioration, cleanliness, freedom of movement, and for evidence of loose or missing fasteners. Inspect hooks and mousing devices for damage. Inspect drip pans and gaskets for damage, proper clearance, and for evidence of loose or missing fasteners. Inspect for evidence of bearing damage, overheating, and abnormal wear. See appendix E for further inspection and test of hooks.		X			

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

**Discussion Notes**

**Print PDF**



EXERCISE 4



## Certifying Official

### Cat 1 Crane Certification Package Review

**Directions**

Exercise 1

Exercise 2

Exercise 3

● Exercise 4

Exercise 5

Exercise 6

Exercise 7

#### MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 CRANES

SHEET 11 OF 17

Crane  
82-00012

Item No.	Inspection Type			Items to be Inspected	Maintenance Inspection Specification	System Inspected	Condition			
	A	B	C				S	U	C	NA
56		X	X	Load Indicators, Load Warning Devices, Load Shutdown Devices	Inspect wiring for damage or deterioration, and for evidence of loose connections. These devices shall be tested for proper operation at this inspection or the CCIR/load test (mark N/A if performed at the CCIR/load test). Follow requirements of SAE J-159 for testing of category 1 and 4 mobile cranes. For other cranes, if not specified elsewhere, the accuracy requirement for all devices is plus 10 percent minus 0 percent of the actual weight. Do not test beyond 131.25 percent of rated capacity (115.5 percent for mobile cranes, mobile boat hoists, and rubber-tired gantry cranes).			X		

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.



[Discussion Notes](#)

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EXERCISE 5



# Certifying Official

## Cat 1 Crane Certification Package Review

**Directions**

Exercise 1

Exercise 2

Exercise 3

Exercise 4

● Exercise 5

Exercise 6

Exercise 7

### MAINTENANCE INSPECTION SPECIFICATION AND RECORD FOR CATEGORY 1 CRANES

SHEET 11 OF 17

Crane  
82-00012

Item No.	Inspection Type			Items to be Inspected	Maintenance Inspection Specification	System Inspected	Condition			
	A	B	C				S	U	C	NA
60	X	X	X	Fire Extinguishers	Verify inspection is current.					

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

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EXERCISE 6A



Directions

- Exercise 1
- Exercise 2
- Exercise 3
- Exercise 4
- Exercise 5
- Exercise 6
- Exercise 7

## Certifying Official

### Cat 1 Crane Certification Package Review

CRANE CONDITION INSPECTION RECORD  
 Note: Inspect components that are reasonably accessible without disassembly.

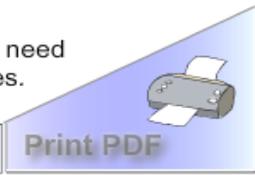
Crane No.: 82-00012	Type: Mobile RT	Location: Test Pad	Operator's Name: Ian Stickpuller	Operator's License No. RP 228343	
Purpose of Inspection: Annual Load Test		Legend: B = Before D = During	A = After	Date Started: 03-09-09	
				Date Completed: 03-13-09	
Item No.	Item Description	B	D	A	Init.
1	Inspect structural components for damaged or deteriorated members, and for evidence of loose and missing fasteners and cracked welds.	✓	✓	✓	J.M.
2	Inspect wire rope for wear, broken wires, corrosion, kinks, damaged strands, crushed or flattened sections, condition of sockets, dead end connections, and for proper lubrication.	✓	✓	✓	J.M.
3	Inspect hooks for cracks, sharp edges, gouges, distortion, and freedom of rotation.	✓	✓	✓	J.M.
4	Inspect hoist brakes and clutches, and rotate brakes on floating cranes for condition, wear, proper adjustment and proper operation. Spot check horizontal movement brakes and clutches for condition, wear, proper adjustment and proper operation.	✓	✓	✓	J.M.
5	Inspect controls and control components for condition and proper operation.	✓	✓	✓	J.M.
6	Inspect motors for condition and proper operation.	✓	✓	✓	J.M.
7	Inspect limit switches for condition and proper operation. (Hook lower limit switch inspections/verifications may be performed at the maintenance inspection in lieu of the CCIR. Annotate in Remarks block if performed at the maintenance inspection.)	✓	✓	✓	J.M.
8	If load test is performed, inspect load indicators, load warning devices, and load shutdown devices for condition and working accuracy as specified in appendix C or D as applicable. (This may be performed at the maintenance inspection in lieu of the CCIR. Mark N/A if performed at the maintenance inspection.)	✓	✓	✓	J.M.
9	Inspect mechanical equipment (shafts, couplings, gearing, bearings, etc.) for condition and proper operation.	✓	✓	✓	J.M.
10	Inspect sheaves for condition and evidence of loose bearings and misalignment.	✓	✓	✓	J.M.
11	Inspect wheels, axles, and trolley rails (as applicable) for uneven wear, cracks, and for condition and evidence of loose bearings and misalignment.	✓	✓	✓	J.M.
12	Inspect load chains and sprockets for condition and proper operation.	✓	✓	✓	J.M.
13	Verify capacity chart or hook load rating data is in view of operator and/or rigging personnel.	✓	✓	✓	J.M.



Page 1 of 2

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)



EXERCISE 6B



## Certifying Official

### Cat 1 Crane Certification Package Review

**CRANE CONDITION INSPECTION RECORD**

Note: Inspect components that are reasonably accessible without disassembly.

Crane No.: 82-00012	Type: Mobile RT	Location: Test Pad	Operator's Name: Ian Stickpuller	Operator's License No. RP 229343	
Purpose of Inspection: Annual Load Test		Legend: B = Before D = During	A = After	Date Started: 03-09-09	Date Completed: 03-13-09
Item No.	Item Description	B	D	A	Init.
1	Inspect structural components for damaged or deteriorated members, and for evidence of loose and missing fasteners and cracked welds.	✓	✓	✓	J.M.
2	Inspect wire rope for wear, broken wires, corrosion, kinks, damaged strands, crushed or flattened sections, condition of sockets, dead end connections, and for proper lubrication.	✓	✓	✓	J.M.
3	Inspect hooks for cracks, sharp edges, gouges, distortion, and freedom of rotation.	✓	✓	✓	J.M.
4	Inspect hoist brakes and clutches, and rotate brakes on floating cranes for condition, wear, proper adjustment and proper operation. Spot check horizontal movement brakes and clutches for condition, wear, proper adjustment and proper operation.	✓	✓	✓	J.M.
5	Inspect controls and control components for condition and proper operation.	✓	✓	✓	J.M.
6	Inspect motors for condition and proper operation.	✓	✓	✓	J.M.
7	Inspect limit switches for condition and proper operation. (Hook lower limit switch inspections/verifications may be performed at the maintenance inspection in lieu of the CCIR. Annotate in Remarks block if performed at the maintenance inspection.)	✓	✓	✓	J.M.
8	If load test is performed, inspect load indicators, load warning devices, and load shutdown devices for condition and working accuracy as specified in appendix C or D as applicable. (This may be performed at the maintenance inspection in lieu of the CCIR. Mark N/A if performed at the maintenance inspection.)	✓	✓	✓	J.M.
9	Inspect mechanical equipment (shafts, couplings, gearing, bearings, etc.) for condition and proper operation.	✓	✓	✓	J.M.
10	Inspect sheaves for condition and evidence of loose bearings and misalignment.	✓	✓	✓	J.M.
11	Inspect wheels, axles, and trolley rails (as applicable) for uneven wear, cracks, and for condition and evidence of loose bearings and misalignment.	✓	✓	✓	J.M.
12	Inspect load chains and sprockets for condition and proper operation.	✓	✓	✓	J.M.
13	Verify capacity chart or hook load rating data is in view of operator and/or rigging personnel.	✓	✓	✓	J.M.



Page 1 of 2

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

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EXERCISE 7



- Directions
- Exercise 1
- Exercise 2
- Exercise 3
- Exercise 4
- Exercise 5
- Exercise 6
- Exercise 7

## Certifying Official

### Cat 1 Crane Certification Package Review

#### CERTIFICATION OF LOAD TEST AND CONDITION INSPECTION

Activity PWC LAS VEGAS				Building/Location Bldg. 539										
Crane No.	Type	OEM's Rated Capacity				Certified Capacity								
82-00012	Mobile RT	Main	80,000	lbs.	10	feet	Main	51,680	lbs.	10-15	feet			
		Aux		lbs.		feet	Aux		lbs.		feet			
		Whip	12,920	lbs.	Variable	feet	Whip	12,920	lbs.	Variable	feet			
<input checked="" type="checkbox"/> Annual Certification <input type="checkbox"/> Biennial Load Test Crane <input type="checkbox"/> Interim Recertification (Reason _____)							Appendix 'E' Applicable Crane Test Procedure Paragraphs (Include applicable subparagraphs.)							
							1	1.1	1.2	1.3	1.4	1.4.1	1.4.2	1.4.5
							1.6	16.1	1.7	1.7.1	5	5.1	5.3	5.4
Category 1 Cranes*							5.4.1	5.4.1.a	5.4.1.b	5.4.1.c	5.4.2	5.4.2.a	5.4.2.b	5.4.2.c
Boom Length	Test Load %	Minimum Radius		Maximum Radius		5.4.2.d	5.4.3	5.5	5.5.1	5.5.1.a	5.5.1.b	5.5.1.c	5.5.1.d	
35 - 110 ft.		Pounds	Feet	Pounds	Feet									
Main	105%	54,225	10-15	7,070	60	5.5.1.e	5.5.2	5.5.2.a	5.5.2.b	5.5.3	5.5.3.a	5.5.3.b	5.5.3.c	
Aux														
Whip	105%	13,566	25			5.5.4	5.5.5							
Other														
Hook Tram Measurements		8"	8"	8"										
Main Hook														
Aux Hook		4"	4"	4"										
Whip Hook														
Other														
Category 2 Cranes							Certification							
Hoist	Test Load %	Pounds	Hook Tram Measurements			This is to certify that inspections and tests have been conducted in accordance with the procedures set forth in the current NAVFAC P-307. It is further certified that the crane identified above is satisfactory to lift its certified capacity at its rated radii.								
			Base Meas.	Before Test	After Test									
Main														
Aux														
Other														
Category 3 Cranes							Test Director (Signature)				Date:			
Hoist	Test Load %	Pounds	Hook Tram Measurements			<i>Thomas J. Miller</i>				03-13-09				
			Base Meas.	Before Test	After Test	Inspector (Signature)				Date:				
Main						<i>Joe McSpencer</i>				03-13-09				
Aux						Inspector (Signature)				Date:				
Other										Date:				
Annual Certifications Since Hook NDT							Certifying Official (Signature)				Date:			
3											Expiration Date			
Remarks														
Not Certified for lifts on rubber. Certified capacity based on Main Hoist reeved with 4 parts of line. See Supplemental Sheet for additional test information.														
* For mobile cranes, list all test loads and configurations (e.g., over side/over rear, boom extended/retracted, lifts on tires, travelling, etc.). If necessary, use figure 3-2.														

Review the data presented from the crane certification package. Consider errors, missing information, or additional questions that need to be addressed. Use the link below to reveal the discussion notes.

[Discussion Notes](#)

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DISCUSSION NOTES

Exercise 1:

**MISR**  
#49 There is no notation about a torque check of the bearing being performed.

Exercise 2:

**MISR**  
#52 The box is checked SAT, but there are two wires and both need to be identified and checked individually.  
The minimum dimension is not recorded in the Remarks Block of this MISR as required.

Exercise 3:

**MISR**  
#53 The box is checked SAT, but there are two wires and both need to be identified and checked individually

Exercise 4:

**MISR**  
#56 – Marked Unsat. No notation in remarks section, no indication it was corrected.

Exercise 5:

**MISR**  
#60 – Fire extinguishers not marked. Should be marked Sat.

Exercise 6:

**CCIR**  
Boxes are checked instead of being marked S, U, or C.  
Items 6,12,18,27,28 should have been marked N/A.

Exercise 7:

**Certification of Load Test and Condition Inspection**  
Paragraph 1.6.2 and 1.6.4 are missing from the citations.  
The load test for the maximum load is underweight by 39 lbs.  
The form states that no lifts will be made on rubber, but paragraph 5.5.5 is cited.  
**The certified capacity of 51,680 lbs. x 105% (minimum test weight) = 54,264 lbs. The listed test weight is 54,225 lbs. and is 39 lbs short.**

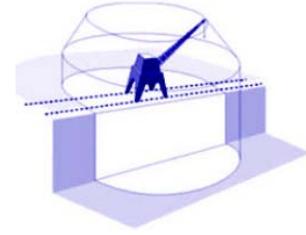
# NOTES



## CRANE AND RIGGING GEAR ACCIDENTS

### CRANE ENVELOPE

In order to define a crane accident, you must first understand the crane operating envelope. The operating envelope includes the crane, the operator, the riggers, and the crane walkers, other personnel, the rigging gear between the hook and the load, the load itself, the supporting structures, such as the rails or the ground, and the lift procedure.



### RIGGING GEAR ENVELOPE

The rigging gear operating envelope contains the rigging gear and miscellaneous equipment covered by NAVFAC P-307 section 14, the user of the gear, the load itself, other personnel involved in the operation, the structure supporting the gear, the load rigging path, and the rigging procedure.

### CRANE ACCIDENT

A crane accident occurs when any of the elements in the operating envelope fail to perform correctly during operations, including operations during maintenance or testing, resulting in the following: personnel injury or death, material or equipment damage, dropped load, derailment, two-blocking, overload or collision.



### RIGGING GEAR ACCIDENTS

Rigging gear accidents occur when any of the elements in the operating envelope fails to perform correctly during weight handling operations resulting in the following: personnel injury or death, material or equipment damage, dropped load, two blocking, or overload.

### ACCIDENT EXAMPLES

Some common examples of accidents are: dropped loads, injuries from a shifting load, failure of rigging gear resulting in a dropped load, overloads, and improperly secured loads falling from pallets.



### ACCIDENT EXCEPTION

Component failure such as motor burnout, gear tooth breakage, bearing failure, etc. is not considered an accident just because damage to equipment occurred, unless the component failure causes other damage such as a dropped boom or dropped load.

### ACCIDENT CAUSES

In most cases, crane accidents are due to inattention to the task, poor judgment, team members having too much confidence in their abilities or operating the crane too fast.

### OPERATOR RESPONSIBILITIES

The operator can play a significant role in eliminating human error and accidents. Drugs and alcohol can affect a person's capability to think, reason, or react in normal situations and can certainly lead to serious accidents. Operators must always consult their physicians regarding effects of prescription drugs before operating equipment, and recognize that medications often affect people differently. An operator is responsible for evaluating his or her physical and emotional fitness.

### CRANE ACCIDENTS

If a crane accident occurs, personnel must take the following actions: Stop operations as soon as possible, however don't stop at the expense of safety. In some circumstances, for example, if a crane is involved in a collision as a load is being lowered, the operator should first land the load, then, follow the accident response procedure. Don't try to correct the problem unless life or limb is in danger. Call or have someone call 911 if an injury occurs. Secure the crane. Secure power as required. If danger exists to the crane or personnel, place crane and load in a safe position. Notify supervision as soon as safely possible. Insure that the accident scene is preserved to aid the investigation.



#### ACCIDENT REPORTING - CONTRACTOR

The contractor shall notify the contracting officer as soon as practical but no later than four hours after any WHE accident. Secure the accident site and protect evidence until released by the contracting officer. Conduct an accident investigation to establish the root cause(s) of any WHE accident. Crane operations shall not proceed until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. Contractors shall provide to the contracting officer, within thirty days of any accident, a Crane and Rigging Gear Accident Report using the form provided in NAVFAC P-307 Section 12 consisting of a summary of circumstances, an explanation of cause or causes, photographs (if available), and corrective actions taken.

#### ACCIDENT REPORTING - CONTRACTING OFFICER

The contracting officer shall notify the host activity of any WHE accident upon notification by the contractor and provide the Navy Crane Center and the host activity a copy of every accident report, regardless of severity, upon receipt from the contractor. The contracting officer shall notify the Navy Crane Center of any accident involving a fatality, in-patient hospitalization, overturned crane, collapsed boom, or any other major damage to the crane, load, or adjacent property as soon as possible, preferably within twenty four hours of notification by the contractor. When the contracting officer is not in the local area, the contracting officer shall designate a local representative to ensure compliance with the above noted requirements. The above requirements are in addition to those promulgated by OPNAVINST 5100.23 and related local instructions.

# NOTES

CRANE AND RIGGING GEAR ACCIDENTS MODULE EXAM

*Online exam questions may appear in a different order than those listed below.*

1. When rigging gear covered by P-307 section 14 fails while suspended from a structure and drops the load, it is a \_\_\_\_\_.

- A. load configuration error
- B. rigging error
- C. crane accident
- D. rigging gear accident

2. The rigging gear operating envelope contains the rigging gear and miscellaneous equipment covered by P-307 section 14, the load itself and ...

- A. load rigging path
- B. the gear or equipment's supporting structure
- C. the user of the gear or equipment

3. To whom or to what are the majority of crane accidents attributed?

- A. personnel error
- B. equipment failure
- C. crane operators
- D. weather conditions
- E. rigger or signalmen

4. The crane operating envelope includes the crane, the operator, the riggers, the crane walkers, and...

- A. the area where the load will be landed
- B. the load
- C. any supporting structures
- D. rigging gear between the hook and the load

5. During maintenance, the rigging gear between the crane hook and the load fails and result is equipment damage. This is reported as a/an...

- A. rigger error
- B. rigging gear deficiency
- C. operator error
- D. crane accident

## CERTIFYING OFFICIAL STUDENT GUIDE

6. If a component failure occurs, such as motor burnout, and does not result in damage, the component failure is considered...

- A. a crane accident
- B. a non-accident
- C. a rigging accident
- D. crane maintenance's responsibility

7. If you have an accident with a crane or you find damage and suspect an accident has happened, your first step is to...

- A. secure the crane and power as required
- B. stop operations as soon as safely possible
- C. notify your supervisor immediately
- D. call emergency services, if anyone is injured

8. Over confidence and poor judgment among team members can contribute to crane and rigging gear accidents. Select additional factors that can contribute to accidents.

- A. operating the crane too fast
- B. the crane operating envelope
- C. engineering lift specifications
- D. inattention to the task

9. During crane operations, the load shifts. The operator reacts quickly and saves the load but causes the crane to derail. This is reported as a/an...

- A. crane walker's error
- B. crane accident
- C. operator error
- D. load configuration error



**CERTIFYING OFFICIAL COURSE EVALUATION**

Student Name: \_\_\_\_\_

Command/Activity/Organization: \_\_\_\_\_

Instructor: \_\_\_\_\_ Date: \_\_\_\_\_

**Directions:** To assist in evaluating the effectiveness of this course, we would like your reaction to this class. Do not rate questions you consider not applicable.

<b>Please rate the following items:</b>	Excellent	Very Good	Good	Fair	Poor
Content of the course met your needs and expectations.					
Content was well organized.					
Materials/handouts were useful.					
Exercises/skill practices were helpful.					
Training aids (slides, videos, etc) were used effectively.					
Instructor presented the material in a manner, which was easy to understand.					
Instructor was knowledgeable and comfortable with the material.					
Instructor handled questions effectively.					
Instructor covered all topics completely.					
Probability that you will use ideas from the course in your work.					
Your opinion of the course.					
Your overall opinion of the training facilities.					

What were the key strengths of the training? How could the training be improved? Other comments?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

List other training topics in which you are interested: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Note:** If you would like a staff member to follow up and discuss this training, please provide your phone number \_\_\_\_\_