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**Objectives**

- Review highlights of the new crane and derricks standard
- Identify crane operator qualification and certification requirements
- Identify types and frequency of inspections for overhead cranes
- Identify supplemental requirements for tower cranes

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**Topics to be Covered**

- New Standard
- Scope
- Ground Conditions
- Assembly/Disassembly
- Power Line Safety
- Inspections
- Rigging
- Signals
- Operator Qualification/Certification
- Tower Cranes (supplemental requirements)

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# Cranes and Derricks

Effective Date - November 8, 2010



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## Important Dates

- Released – July 28, 2010
- Published – August 9, 2010
- Effective – November 8, 2010
  - Qualification of riggers
- Phased in over four years – August 9, 2014
  - Certification of operators phased in over four years (except for State and local licensing)

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## Highlights

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| <ul style="list-style-type: none"><li>• <b>Scope</b></li><li>• Definitions</li><li>• <b>Ground Conditions</b></li><li>• <b>Assembly/Disassembly</b></li><li>• <b>Power Line Safety</b></li><li>• <b>Inspections</b></li><li>• Wire Rope</li><li>• Safety Devices</li><li>• Operational Aids</li><li>• Operation</li><li>• Authority To Stop</li><li>• <b>Signals</b></li><li>• Fall Protection</li><li>• Work Area Control</li><li>• Keeping Clear Of The Load</li><li>• Free Fall/ Controlled Load Lowering</li><li>• <b>Operator Qualification and Certification</b></li></ul> | <ul style="list-style-type: none"><li>• <b>Signal Person Qualifications</b></li><li>• Qualifications of Maintenance and Repair Workers</li><li>• Training</li><li>• Hoisting Personnel</li><li>• Multiple Crane/Derrick Lifts</li><li>• Design, Construction and Testing</li><li>• Equipment Modification</li><li>• <b>Tower Cranes</b></li><li>• Derricks</li><li>• Floating Cranes &amp; Land Cranes on Barges</li><li>• Overhead and Gantry Cranes</li><li>• Dedicated Pile Drivers</li><li>• Sideboom Cranes</li><li>• Requirements for Equipment w/ Capacity of 2000 lbs and Less</li></ul> |
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## What is Covered?

- Functional Description
  - Can hoist
  - Lower
  - Horizontally move a suspended load
- Long List of Examples



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## Examples

- Articulating cranes (such as knuckle-boom cranes)
- Crawler cranes
- Floating cranes
- Cranes on barges
- Locomotive cranes
- Mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes)
- Multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load
- Industrial cranes (such as carry-deck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device
- Crane on a monorail
- Tower cranes (such as fixed jib, "hammerhead boom", luffing boom and self-erecting)
- Pedestal cranes
- Portal cranes
- Overhead and gantry cranes
- Straddle cranes
- Side-boom tractors
- Derricks

*...and Variations of Such Equipment*

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## Scope

- Specific Exclusions
  - Backhoes and forklifts
- Limited Requirements for:
  - Capacity: 2000 pounds or less
  - Dedicated pile drivers
  - Overhead and gantry cranes
  - Side-boom tractors
- Supplemental Requirements for:
  - Tower cranes
  - Derricks
  - Floating cranes & land cranes on barges



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## Ground Conditions



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## Ground Conditions (cont'd)

- Controlling Entity:
  - Provide adequate conditions
  - Firm, drained and graded
- Sufficient to Support Crane (in conjunction with blocking, mats, etc.)



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## Ground Conditions (cont'd)

- Inform User and Equipment Operator of Known Underground Hazards (voids, utilities, etc.)



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## Assembly/Disassembly



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## Assembly/Disassembly (cont'd)

- Two Options:
  - Manufacturer procedures *or*
  - Employer procedures (criteria requirements)



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## Assembly/Disassembly (cont'd)

- Assembly/Disassembly Supervisor
  - Must be a competent and qualified person
- Assembly/Disassembly Supervisor Must Understand Procedures and:
  - Review procedures (unless they've used them before)
  - Check that crew members understand their tasks and hazards
  - Follow manufacturer's prohibitions
  - All rigging work is by a Qualified Rigger
  - When using outriggers, fully extended *or* deployed per the load chart

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## Assembly/Disassembly (cont'd)

- Assembly/Disassembly Supervisor Addresses 12 Key Hazards, Including:
  - Adequate site and ground conditions
  - Sufficient blocking for load and stability
  - Suitable boom and jib pick points
  - Identify center of gravity
  - Stability for pin removal
  - Consider wind speed and weather

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## Power Lines



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## Power Lines (cont'd)

- Step 1: Identify Work Zone
  - Work Zone = marking boundaries OR
  - 360 degrees around crane, up to maximum working radius



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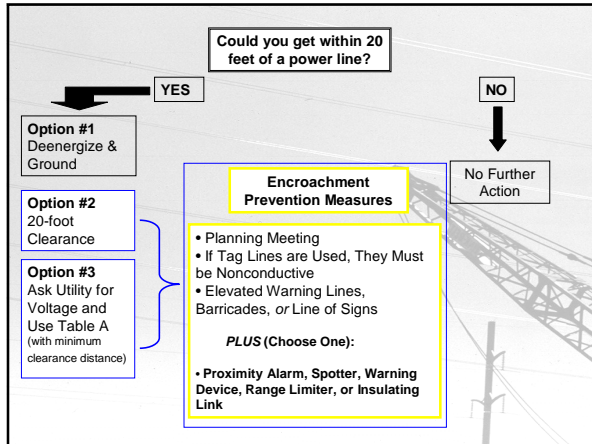
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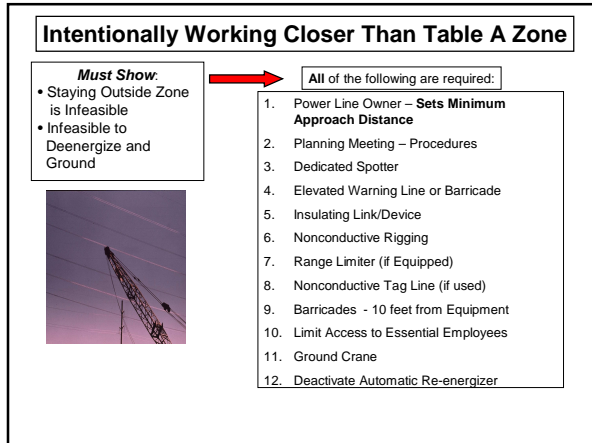
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## Operator Qualification and Certification - 4 Options

- **OPTION 1:**  
Accredited Testing Organization
- **OPTION 2:**  
Employer Qualification Program
- **OPTION 3:**  
U.S. Military
- **OPTION 4:**  
State/Local Government License

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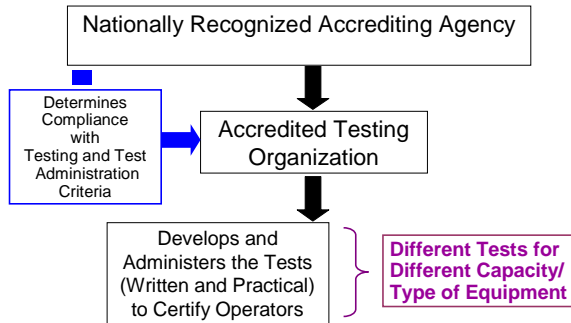
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### Option 1: Accredited Testing Organization



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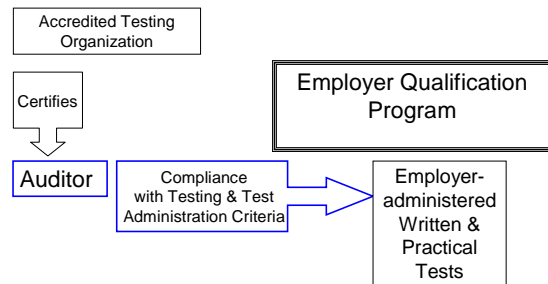
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### Option 2: Employer Qualification Program



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**Option 3: U.S. Military**




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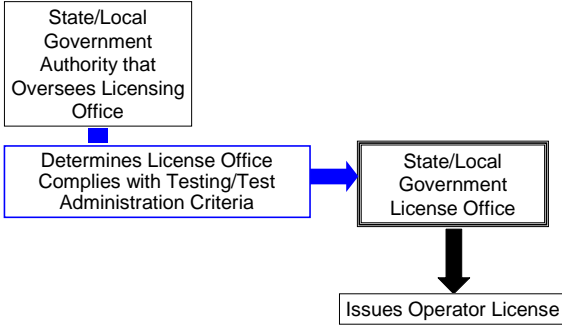
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**Option 4: State/Local Government License**




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**Operator Qualification and Certification (cont'd)**

	<b>Portable</b>	<b>Valid</b>
<b>Accredited Testing Organization</b>	<b>YES *</b>	<b>5 years</b>
<b>Employer Qualification Program</b>	<b>NO</b>	<b>5 years</b>
<b>US Military License</b>	<b>NO *</b>	<b>Set by issuing entity</b>
<b>State/Local License</b>	<b>NO *</b> <b>Valid only in entity's jurisdiction</b>	<b>Set by issuing entity, not &gt; 5 years</b>

Subject to State & Local requirements and whether or not the military/state training meets accredited requirements.

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## Operator Qualification and Certification (cont'd)

### Testing Criteria

- **OPTION 1:**  
Accredited Testing Organization
- **OPTION 2:**  
Employer Qualification Program
- **OPTION 3:**  
U.S. Military
- **OPTION 4:**  
State/Local Gov License

- **Knowledge (Written Test):**
  - Controls/performance characteristics
  - Calculate capacity (with or without calculator)
  - Preventing power line contact
  - Ground support
  - Read and locate info in operating manual
  - Appendix C subjects
- **Practical Test**

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## Signaling




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## Signals

- **Signal Person - When Required:**
  - Point of operation not in full view of operator
  - View of direction of travel is obstructed
  - Site specific safety concerns
- **Signal Types:**
  - Hand, voice, audible or "new"
  - Only time an operator can use a cell phone while lifting

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## Signals (cont'd)

### • Signal Person Qualifications

Qualified How	Documentation	Portable
3 <sup>rd</sup> Party Qualified Evaluator	Yes	Yes
Employer Qualified Evaluator	Yes	No

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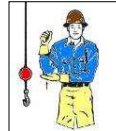
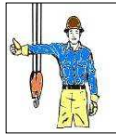
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## Signals (cont'd)

### • Qualification Requirements:

- Know and understand signals
- Competent in using signals
- Basic understanding of crane operation
- Verbal or written test and practical test




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## Inspections

Type of Inspection:	Who Inspects:
Modified or Repaired/ Adjusted	Qualified
Post-assembly	Qualified
Shift	Competent
Monthly	Competent
Annual	Qualified

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## Inspections (cont'd)

- **Shift** = Visual Inspection for Apparent Deficiencies
- **Monthly** = Documented Shift Inspection
- **Annual** = Comprehensive, Every 12 Months

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## Operations

- All loads that are to be received must be rigged by a qualified rigger
- Employer developed operations procedures, load charts, etc., MUST be in the cab of the crane and signed by RPE if manufacturer's manual is not available
- Distracted operator clause = no cell phone unless used for signaling
- New load weight criteria



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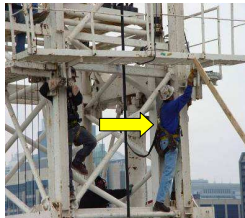
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## Fall Protection

- Part CC has its Own Fall Protection Requirements
- Training Requirement Ties Back to Subpart M
- Subpart M Reference to Anchor Points



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## Wire Rope Inspections

- Daily – No Documentation
- Monthly – Documented
- Annual – Documented
- Category I, II or III Deficiencies



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## Safety Devices

- Safety Devices = Required + *Operational At All Times*
- Include:
  - Crane Level Indicator
  - Boom/Jib Stops (except Derricks)
  - Integral Holding Device/Check Valve for Outrigger Jacks

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## Operational Aids

- Operational Aids are Required *but* Temporary Alternative Measures are Allowed while Being Repaired
- Temporary Alternatives
  - Boom hoist limiting device, if not working:
    - Boom angle indicator or
    - Mark the boom hoist cable



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## Operational Aids (cont'd)

- Replacement of Parts:

- Category I

- Repaired within 7 days

- Category II

- Repaired within 30 days

*Exception: unless employer has documented it ordered parts then repaired within 7 calendar days of receipt*

- Category III

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## Subpart N

- 16 Pages (Public Internet Version)
- 4605 Words
- 26,201 Characters
- 340 Paragraphs
- 468 Lines
- No Preamble

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## Tower Cranes



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## Tower Cranes (cont'd)

### **SUPPLEMENTAL** REQUIREMENTS



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### Highlights of *Supplemental* Tower Crane Requirements

- **Foundations & Structural Supports**
  - Design & inspection
- **Plumb Tolerance**
  - Specification & verification
- **Climbing Procedures**
  - Host structure strength verification
  - Wind
- **Post-erection Load Test**
- **Monthly Inspection:** Tower mast bolts, upper-most tie-in, braces, floor supports, floor wedges

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### Required Documentation

- Monthly and Annual Inspection Reports for:
  - Cranes
  - Wire rope
  - Signal person training
  - Tower crane foundation/support design

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## Resources

- **Cranes and Derricks in Construction Final Rule**
  - <http://www.osha.gov/cranes-derricks/index.html>
- **Associated Training Service Network**
  - <http://www.operator-school.com/>
- **National Commission for the Certification of Crane Operators**
  - <http://www.nccco.org/>
- **National Association of Heavy Equipment Training Schools**
  - <http://www.heavy-equipment-school.com/>
- **North American Crane Bureau Group**
  - <http://www.cranesafe.com/history.htm>
- **California Crane School**
  - <http://www.californiacraneschool.com/>

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## Summary

- Ground Conditions
- Assembly/Disassembly
- Power Line Safety
- Inspections
- Rigging
- Signaling
- Operator Qualification/Certification
- Tower Cranes (Supplemental Requirements)

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