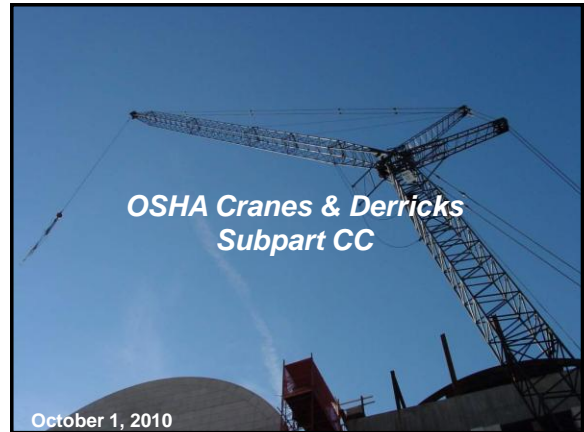




UNITED STATES DEPARTMENT OF LABOR



## OSHA Cranes & Derricks Subpart CC

October 1, 2010

## CRANES & DERRICKS

### Subpart CC

Effective Date: November 8, 2010



OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

## HIGHLIGHTS

- |  |  |
|--|--|
| <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 Operation</li> <li>• <b>Signals</b></li> <li>• <b>Fall Protection</b></li> <li>• Work Area Control</li> <li>• Keeping Clear of the Load</li> <li>• Free Fall and 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 Modifications</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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## SCOPE: WHAT EQUIPMENT IS COVERED?

- *Functional description*

Can hoist, lower and horizontally move a suspended load

&

- *Long list of examples*

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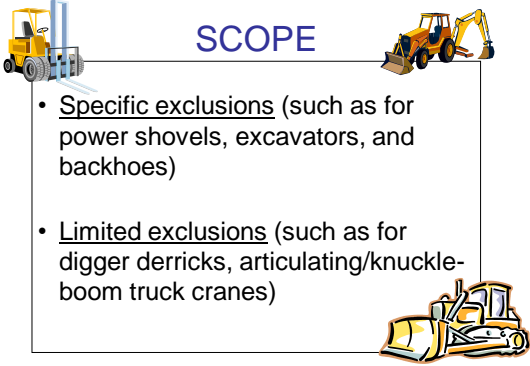
## EXAMPLES LIST

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Articulating cranes (such as knuckle-boom cranes)</li> <li>• Crawler cranes</li> <li>• Floating cranes</li> <li>• Cranes on barges</li> <li>• Locomotive cranes</li> <li>• Mobile cranes (such as wheel-mounted, rough-terrain, all-terrain, commercial truck-mounted, and boom truck cranes)</li> <li>• Multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load</li> <li>• Industrial cranes (such as carry-deck cranes)</li> </ul> | <ul style="list-style-type: none"> <li>• Dedicated pile drivers</li> <li>• Service/mechanic trucks with a hoisting device</li> <li>• Crane on a monorail</li> <li>• Tower cranes (such as fixed jib ("hammerhead boom"), luffing boom and self-erecting)</li> <li>• Pedestal cranes</li> <li>• Portal cranes</li> <li>• Overhead and gantry cranes</li> <li>• Straddle cranes</li> <li>• Sideboom cranes</li> <li>• Derricks</li> </ul> <p>... and variations of such equipment.</p> |
|--|--|

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## SCOPE


- Specific exclusions (such as for power shovels, excavators, and backhoes)
- Limited exclusions (such as for digger derricks, articulating/knuckle-boom truck cranes)



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## GROUND CONDITIONS

**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


Controlling Entity must inform equipment user & operator of **known** underground hazards (voids, utilities, etc.)



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## A CHANGE MADE SINCE THE RULE WAS PROPOSED

Information about ground conditions now includes all information known about ground conditions, including written information in possession of the controlling employer, whether on site or off site.



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## ASSEMBLY / DISASSEMBLY



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## ASSEMBLY / DISASSEMBLY

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



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## ASSEMBLY / DISASSEMBLY

- General requirements, such as:
  - A/D Director = “competent & qualified person”
  - A/D Director must:
    - Understand procedures
    - Review procedures (unless A/D Director has used them before)
    - Check that crew members understand their tasks, hazards
  - Follow manufacturer’s prohibitions
  - All rigging work is done by a Qualified Rigger
  - When using outriggers - fully extend *or* deploy as per the load chart



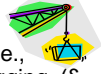
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## CHANGES MADE SINCE THE RULE WAS PROPOSED



- Qualified Rigger – adds requirements that employers must use a qualified rigger for rigging operations during assembly/disassembly and other activities when workers must be in the fall zone to handle a load. (§1926.1404 and § 1926.1425)
- Synthetic Slings – adds requirements (i.e., padding) for use of synthetic slings in rigging. (§ 1926.1404(r))



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## POWER LINES



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## POWER LINES

- Identify Work Zone

Work Zone =

Marking boundaries

*or*

360 degrees around crane up to maximum working radius



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Could you get within 20 feet of power line?

YES

NO

**Option #1**  
Deenergize & Ground

**Option #2**  
20-foot clearance

**Option #3**  
Ask Utility for Voltage and Use Table A (with minimum clearance distance)

### Encroachment Prevention Measures (Equipment Operations)

- Planning meeting
- If tag lines used → Non-conductive
- Elevated warning lines, barricade or line of signs

•PLUS (Choose one):

- Proximity alarm, spotter, warning device, range limiter, or insulating link

No further action

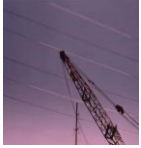
**Table A – Minimum Clearance Distances**

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1000	45
over 1000	(as established by the power line owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution)

### Intentionally Working Closer Than Table A Zone

**Must Show:**

- Staying outside zone is infeasible
- Infeasible to deenergize and ground




**All of the following are required:**


1. Power line owner – sets **minimum approach distance**
2. Planning meeting – minimum procedures
  - Dedicated spotter
  - Elevated warning line or barricade
  - Insulating link/device
  - Nonconductive rigging
  - Range limiter (if equipped)
  - Nonconductive tag line (if used)
  - Barricades - 10 feet from equipment
  - Limit access to essential workers
  - Prohibit non-operator workers from touching above insulating link
  - Properly ground crane
  - Deactivate automatic re-energizer
  - Insulating line cover-up installed

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### CHANGE MADE SINCE THE RULE WAS PROPOSED



Electric Utilities – employers whose employees are qualified to perform power distribution and transmission work are considered to be in compliance with §§ 1926.1407-1926.1411 of subpart CC (power lines sections) when performing subpart V work in accordance with § 1910.269. (§ 1926.1400(g))



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## CRANES & DERRICKS

### OPERATOR CERTIFICATION



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## WORKER PARTICIPATION

- Training
  - Workers must be trained to recognize and avoid hazards.
  - Workers must **understand** this training
    - Provided in a manner they understand
      - Oral/written training
    - Provided in a language they understand
      - Some Spanish language materials are already available through OSHA

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## OPERATOR QUALIFICATION / CERTIFICATION

- **OPTION 1:**  
Accredited testing organization
- **OPTION 2:**  
Audited employer program
- **OPTION 3:**  
U.S. military
- **OPTION 4:**  
State/local gov't license

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### A CHANGE MADE SINCE THE RULE WAS PROPOSED

The final rule now requires that employers must comply with local and state licensing regulations that meet requirements of § 1926.1427(e) and (j). (§ 1926.1427(a))



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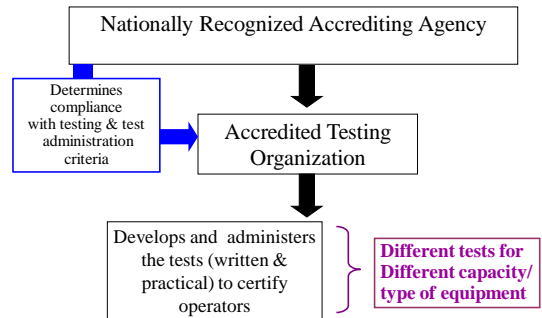
# OPERATOR QUALIFICATION / CERTIFICATION

- **OPTION 1:** → Accredited testing organization
- **OPTION 2:** → Audited employer program
- **OPTION 3:** → U.S. military
- **OPTION 4:** → State/local license

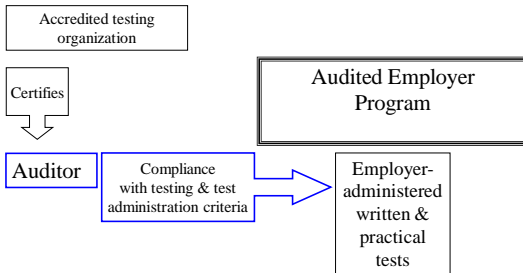
## Testing Criteria

- **Knowledge** (written test):
  - Controls/performance characteristics
  - Calculate capacity
  - Preventing power line contact
  - Ground conditions & equipment support
  - Use and locate info in operating manual
  - Appendix C subjects
- **Practical test**

### Option 1: Accredited Testing Organization



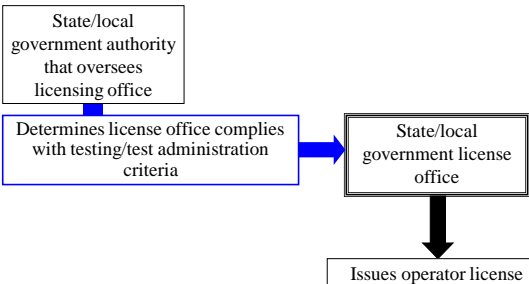
### Option 2: Audited Employer Program



### Option 3: U.S. Military

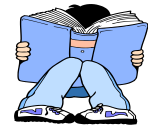


### Option 4: State/local government license



## CHANGES MADE SINCE THE RULE WAS PROPOSED

- Certification Costs for Operators – employers must pay for certification or qualification of their currently uncertified or unqualified operators. (§ 1926.1427(a)(4))



## CHANGES MADE SINCE THE RULE WAS PROPOSED

- Test Administration and Language Requirements – written tests may be administered in a language understood by the operator candidate. (§ 1926.1427(h))
- Certification – clarifies that when the operator's testing is based on a language other than English it must be noted on the certificate. (§ 1926.1427(h))



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## CHANGE MADE SINCE THE RULE WAS PROPOSED

Audited Employer Program – now specifies that the audit must be conducted in accordance with nationally recognized auditing standards. (§ 1926.1427(c))



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## OPERATOR QUALIFICATION / CERTIFICATION

	Portable	Valid
Accredited testing organization	YES *	5 years
Audited Employer Program	NO	5 years
U.S. Military license	NO *	Set by issuing entity
State/local license	NO * Valid only in jurisdiction	Set by issuing entity, not > 5 years

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



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## OPERATOR QUALIFICATION / CERTIFICATION

**November 8, 2010:** State or local license required if (1) working within a state or locality that has licensing requirements and (2) the licensing program meets the licensing and certification criteria listed in subpart CC.

**November 8, 2010-November 10, 2014:** Employer must ensure that all operators are competent to operate the equipment safely and are trained and evaluated on that training before operating the equipment.

**November 10, 2014:** All operators must be certified or qualified.



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## SIGNALS

- **Signal Types:**
  - Hand, voice, audible or “new”
  - Only time an operator can use a cell phone while lifting (but must be hands free)

- **Signal person – when required:**
  - Point of operation not in full view of operator
  - View of direction of travel is obstructed
  - Site-specific safety concerns



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## SIGNAL PERSON

- **Qualification Requirements:**
  - Know & understand signals
  - Competent in using signals
  - Basic understanding of crane operation
  - Verbal or written test plus practical test



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## SIGNAL PERSON

### Qualifications

Qualified how	Documentation	Portable
Third party qualified evaluator	Yes	Yes
Employer qualified evaluator	Yes	No



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## CRANES & DERRICKS

### INSPECTIONS



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## INSPECTIONS

### Type of Inspection:

### Who Inspects:

Modified or repaired/adjusted	Qualified person
Post-assembly	Qualified person
Shift	Competent person
Monthly	Competent person
Annual	Qualified person



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## CHANGES MADE SINCE THE RULE WAS PROPOSED

- Inspections – all documentation required by the inspection provisions must be available to all inspectors performing required inspections (including wire rope inspections). (§§ 1926.1412 & 1926.1413)
- Pre-Erection Inspection for Tower Cranes – adds a requirement to include inspection of crane components after transportation to the work site and prior to erection of the crane. (§ 1926.1435)



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## OPERATIONS



- Operations procedures must be developed by a qualified person when the manufacturer's procedures are unavailable.
- Procedures related to the capacity of the equipment must be developed by a registered professional engineer (familiar with the equipment) when the manufacturer's procedures are unavailable.
- This information must be readily available in the cab of the crane.



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## OPERATIONS

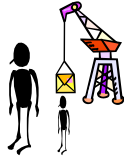
Operators cannot be engaged in activities that distract her or his attention while operating the equipment (for example, no cellular phone use unless used for signaling).



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## KEEPING CLEAR OF THE LOAD

- When workers must be in the fall zone to handle a load, the load must be rigged by a qualified rigger.



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## FALL PROTECTION

- Fall protection requirements are specified in the final rule.
- Training is required regarding the criteria and use of fall protection systems that is consistent with 29 CFR 1926 subpart M.
- Anchor points for fall protection systems must meet subpart M requirements and criteria.



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## SAFETY DEVICES AND OPERATIONAL AIDS



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## SAFETY DEVICES

- Safety devices are required and must be operational at all times
- Include:
  - Crane level indicator
  - Boom/Jib stops (except derricks)
  - Integral holding device/check valve for outrigger and stabilizer jacks



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## OPERATIONAL AIDS

Operational aids are required *but* temporary alternative measures are also allowed while operational aids are being repaired.



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## OPERATIONAL AIDS

Boom hoist limiting device, luffing jib limiting device, and anti two-blocking device.

### Replacement of parts:

Must be repaired within 7 days of discovery of deficiency.



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## OPERATIONAL AIDS

### Category II Devices

Boom angle or radius indicator, boom length indicator, load weighing devices, jib angle indicator, outrigger/stabilizer position sensor/monitor, and hoist drum rotation indicator.

#### Replacement of parts:

Must be repaired within 30 days of discovery of deficiency.



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## OPERATIONAL AIDS

**Exception: employer has documented that it ordered the part and then repaired the equipment within 7 days of receipt of the replacement part.**



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## CHANGE MADE SINCE THE RULE WAS PROPOSED



When any necessary repairs or adjustments are needed for the equipment and alternative methods are being implemented, the employer must communicate this information to all affected employees at the beginning of each shift. (§ 1926.1417(j))



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## TOWER CRANES



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## TOWER CRANES

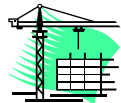
### SUPPLEMENTAL REQUIREMENTS



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### Some 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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## WORKER PARTICIPATION

- Workers have a right to a safe and healthy workplace
- Workers have a right to report safety issues without fear of retaliation
- Workers may report safety concerns to OSHA at 1-800-321-OSHA



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[www.osha.gov](http://www.osha.gov)  
800-321-OSHA



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