



Cranes and Derricks in Construction The New 2010 Standards

Presented by Rick Callor

URS Safety by Design Webcast

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This presentation was taken and derived from several OSHA presentations including one originally prepared by John Newquist of OSHA as a preliminary aid for the new standard, one from the OSHA Directorate of Construction, and one posted on the OSHA website dated 9-30-10.



Why a new standard?

- Cranes and Derricks in Construction
NEW 29 CFR 1926 Subpart CC
(29 CFR 1926.1400 *et seq.*)
- Crane accidents killed an average of 78 people per year between 2003 and 2005
- OSHA expects the final standard to prevent 22 fatalities and 175 non-fatal injuries each year.



Important dates

- Released – July 28, 2010
- Published – August 9, 2010
- Effective – November 8, 2010
 - Certification of riggers within 90 days after publication of rule
- Phased in over four years – August 9, 2014
 - Certification of operators phased in over four years



Highlights

- **Scope**
- Definitions
- **Ground Conditions**
- **Assembly/Disassembly**
- **Power Line Safety**
- **Inspections**
- Wire Rope
- Safety Devices
- Operational Aids
- Operation
- Authority To Stop
- **Signals**
- Fall Protection
- Work Area Control
- Keeping Clear Of The Load
- Free Fall/ Controlled Load Lowering
- **Operator Qualification and Certification**
- **Signal Person Qualifications**
- Qualifications of Maintenance and Repair Workers
- Training
- Hoisting Personnel
- Multiple Crane/Derrick Lifts
- Design, Construction and Testing
- Equipment Modification
- **Tower Cranes**
- Derricks
- Floating Cranes & Land Cranes on Barges
- Overhead and Gantry Cranes
- Dedicated Pile Drivers
- Sideboom Cranes
- Requirements for Equipment w/ Capacity of 2000 lbs and Less

What is covered?



- Functional description
 - Can hoist, lower, and horizontally move a suspended load
- and
- Long list of examples

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 or “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*

Scope

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



Ground Conditions



Ground conditions



- Controlling entity:
Provide adequate conditions
 - Firm, drained and graded
 - Sufficient to support crane (in conjunction with blocking, mats, etc.)

Ground conditions

- Controlling entity must Inform equipment user and operator of **known** underground hazards (voids, utilities, etc.)



Change was made since proposed rule

- 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.



Assembly/Disassembly



Assembly/Disassembly

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



Assembly/Disassembly

General requirements include:

- Assembly/Disassembly Director
 - Must be a “competent and qualified person”
- Assembly/Disassembly Director must:
 - Understand procedures
 - 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 extend *or* deploy per the load chart

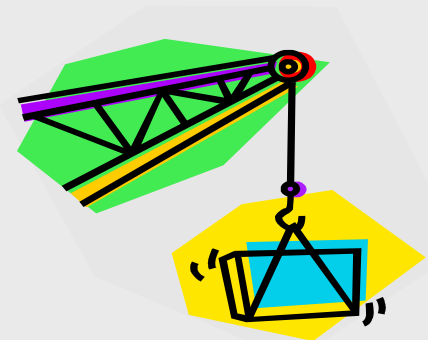
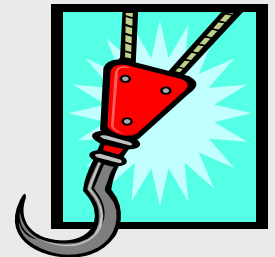
Assembly/Disassembly

- Assembly/disassembly director must address 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
 - Wind speed and weather
 - The suitability of blocking material
 - Verification of the loads for assist cranes
 - Snagging of cables or components
 - Struck by counterweights
 - Boom hoist brake failure
 - Loss of backwards stability

Changes made since the proposed rule



- 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))



Power Lines



Power lines



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

Decision Chart

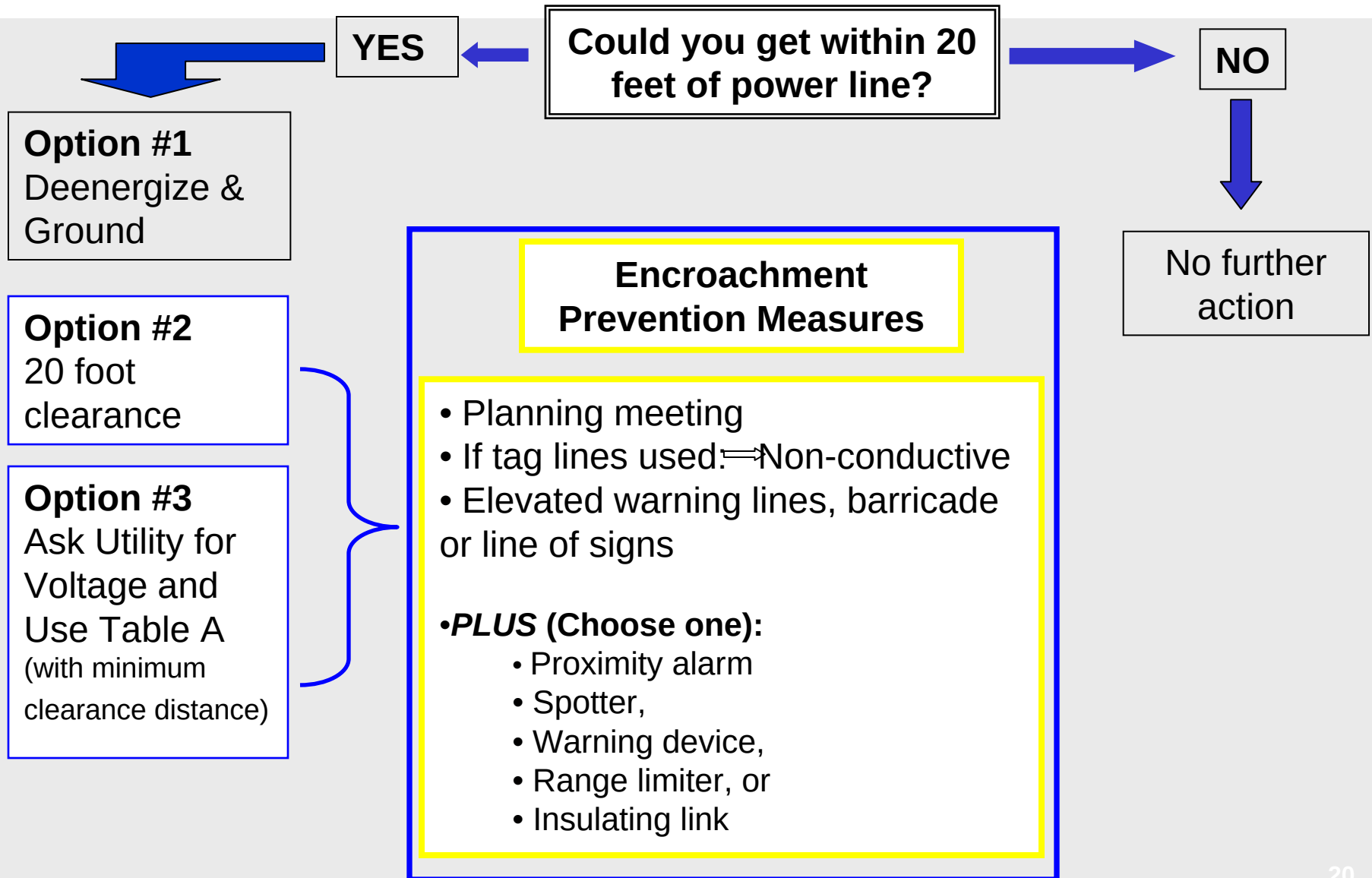


Table A – Minimum Clearance Distances

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

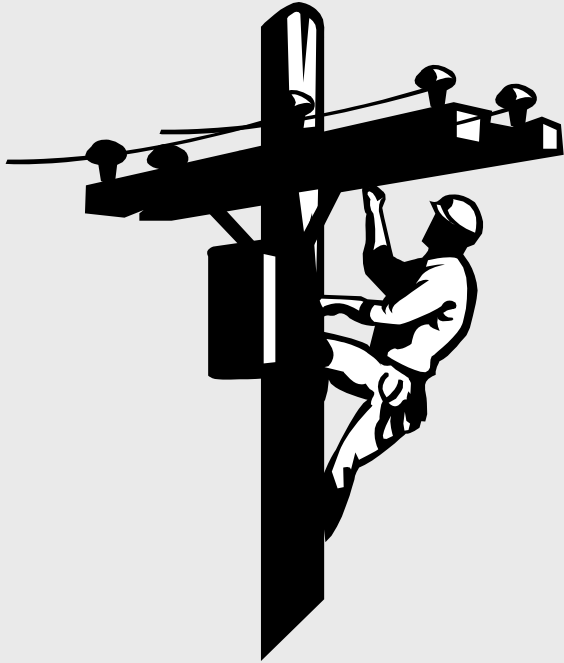


All of the following are required:

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



Change made since proposed rule



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))



Operator Certification



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

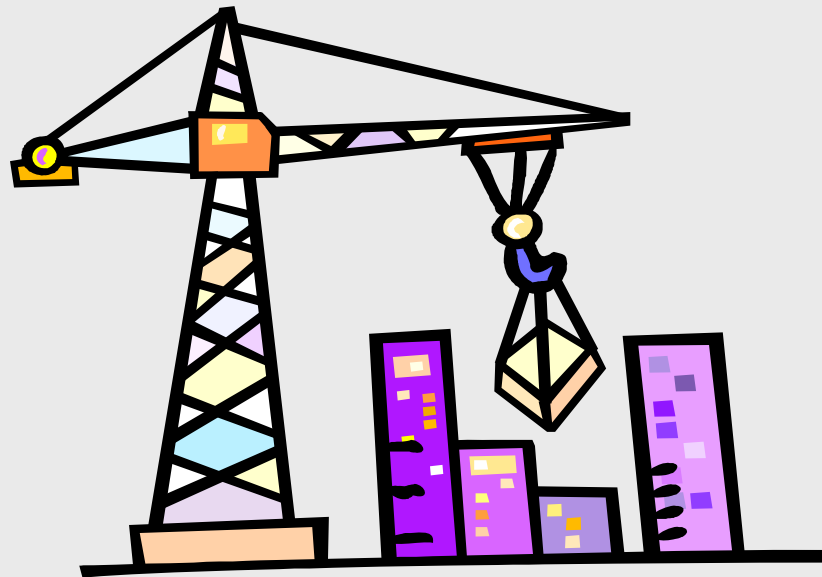
Operator Qualification/Certification



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

Change made since proposed rule

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))



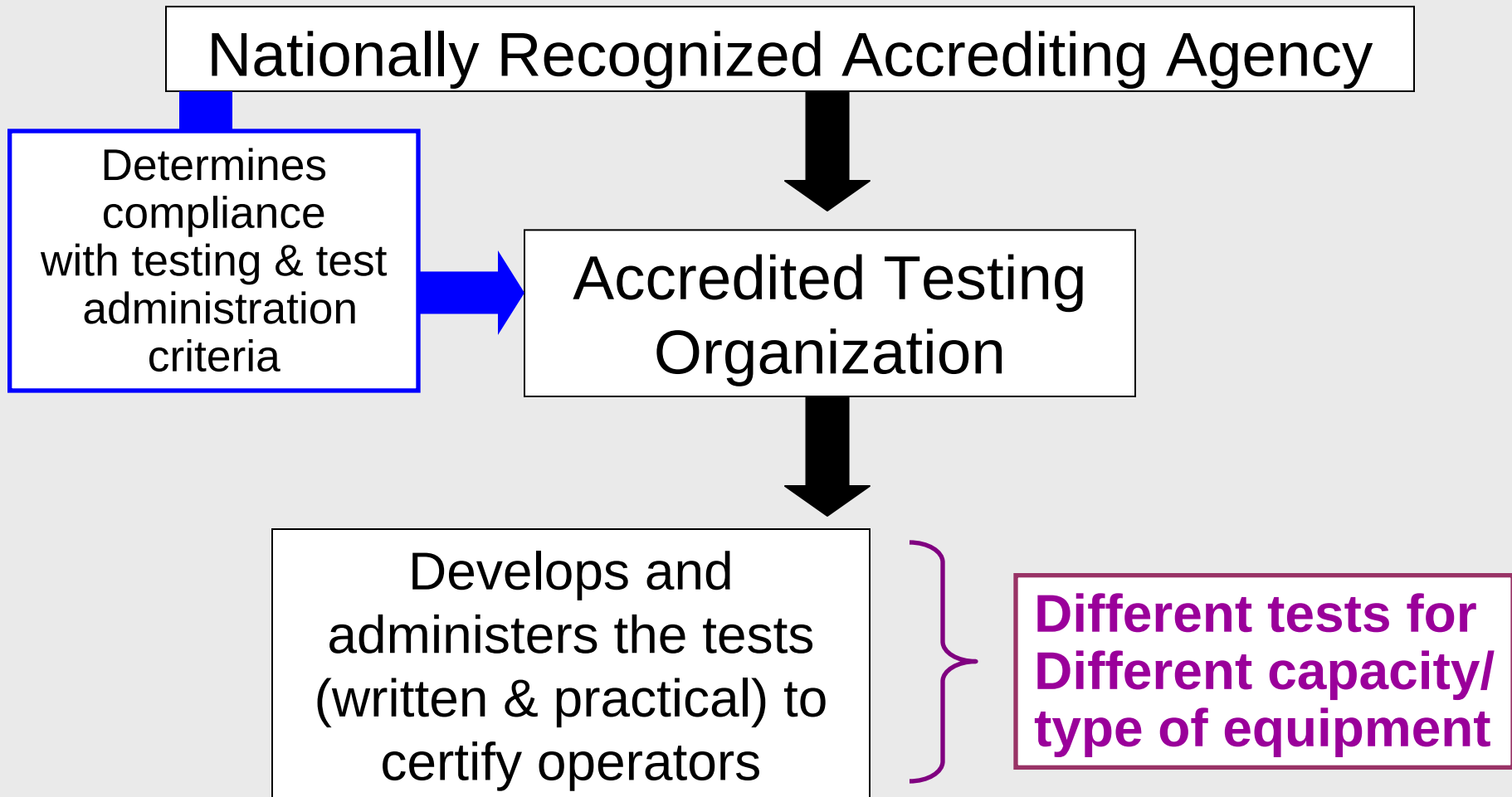
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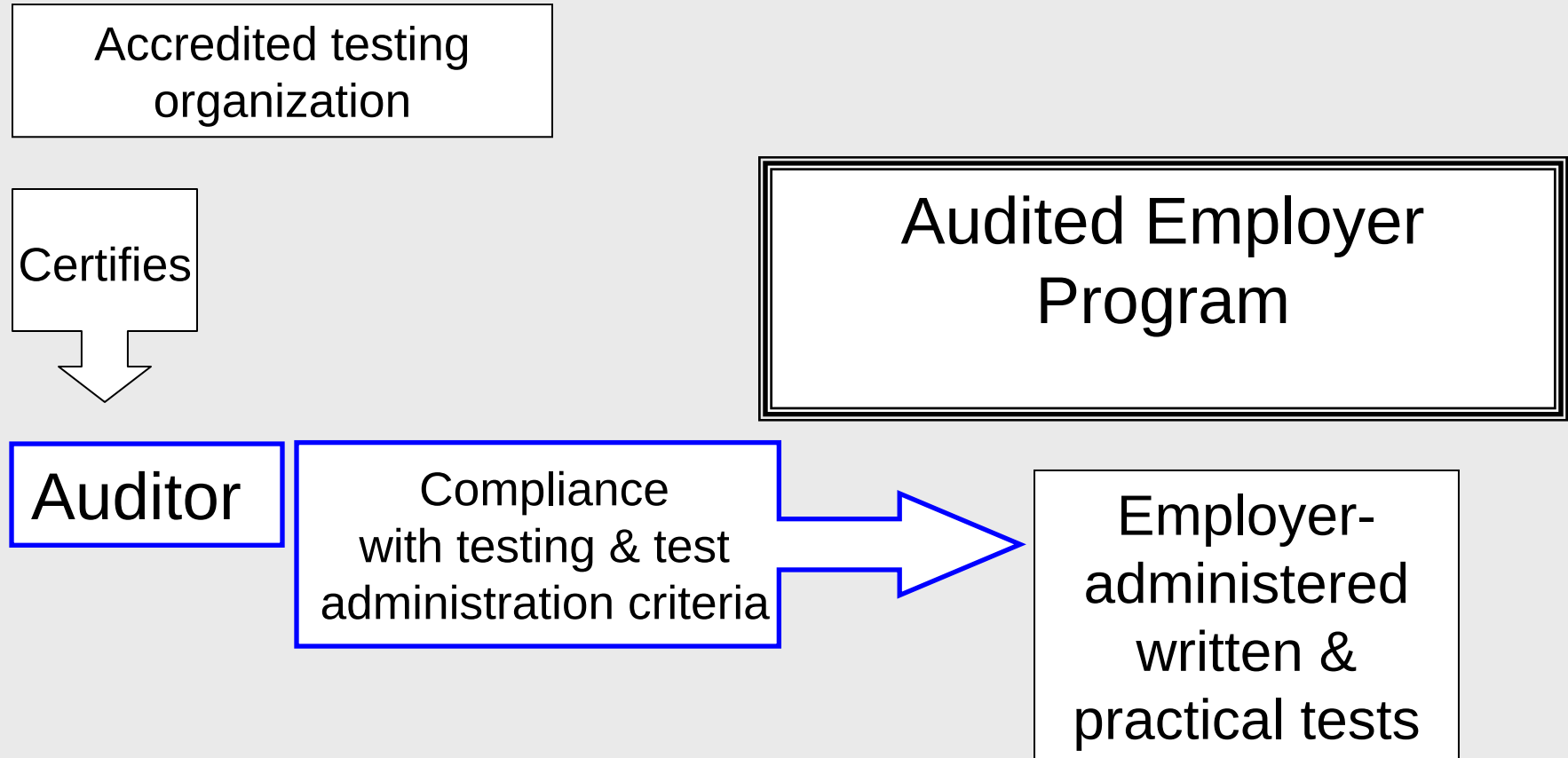
Testing Criteria

- **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

State/local government
authority that oversees
licensing office

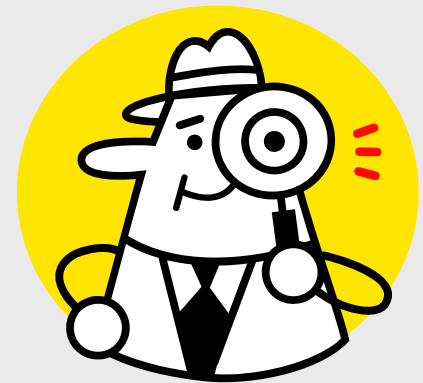
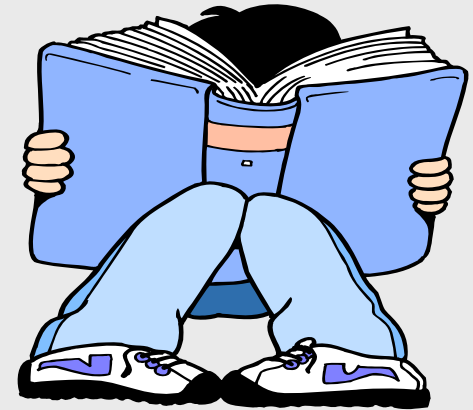
Determines license office
complies with testing/test
administration criteria

State/local
government license
office

Issues operator
license

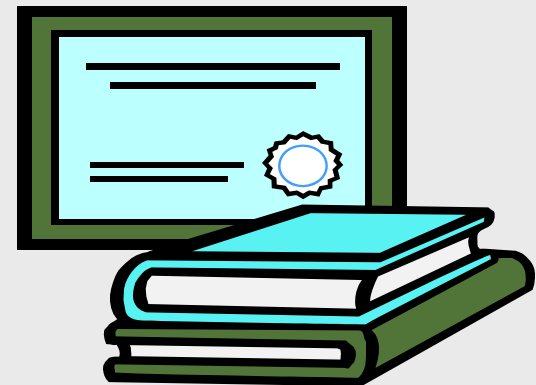
Changes made since proposed rule

- Certification Costs for Operators – employers must pay for certification or qualification of their currently uncertified or unqualified operators. (§ 1926.1427(a)(4))
- Audited Employer Program – now specifies that the audit must be conducted in accordance with nationally recognized auditing standards. (§ 1926.1427(c))



Changes made since proposed rule

- 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))



Operator qualification and 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

Operator qualification and 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.

Signaling



Signals

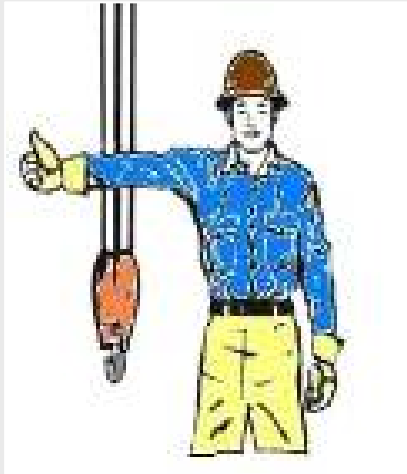
Signal Types:

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

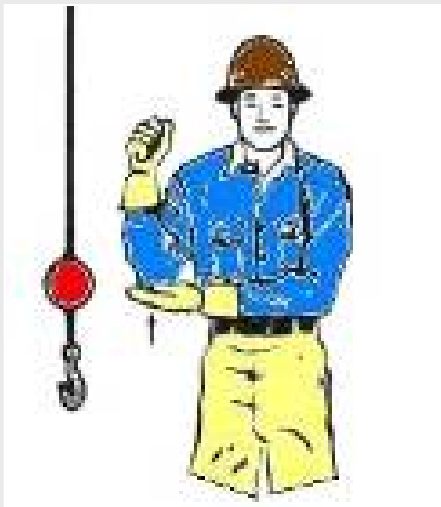
Signal person – when required:

- Point of operation not in full view of operator
- View of direction of travel is obstructed
- Site-specific safety concerns

Signal person



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



Signal person qualifications

Qualified How	Documentation	Portable
3 rd Party Qualified Evaluator	Yes	Yes
Employer Qualified Evaluator	Yes	No

Inspections



29 CFR 1926.1412: Inspections

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

Changes made since proposed rule

- 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)

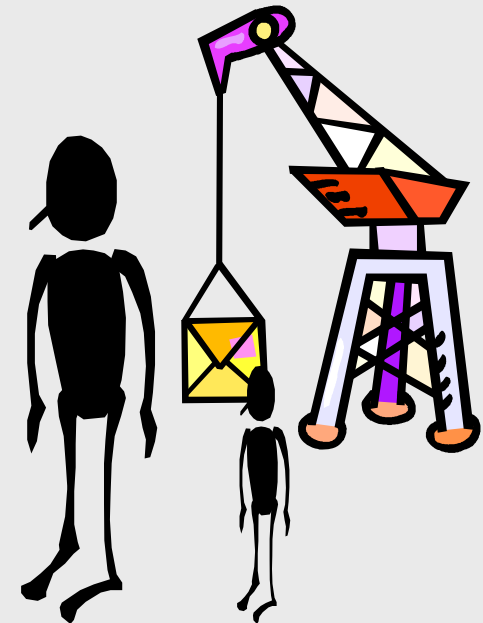
Operations



- 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.

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

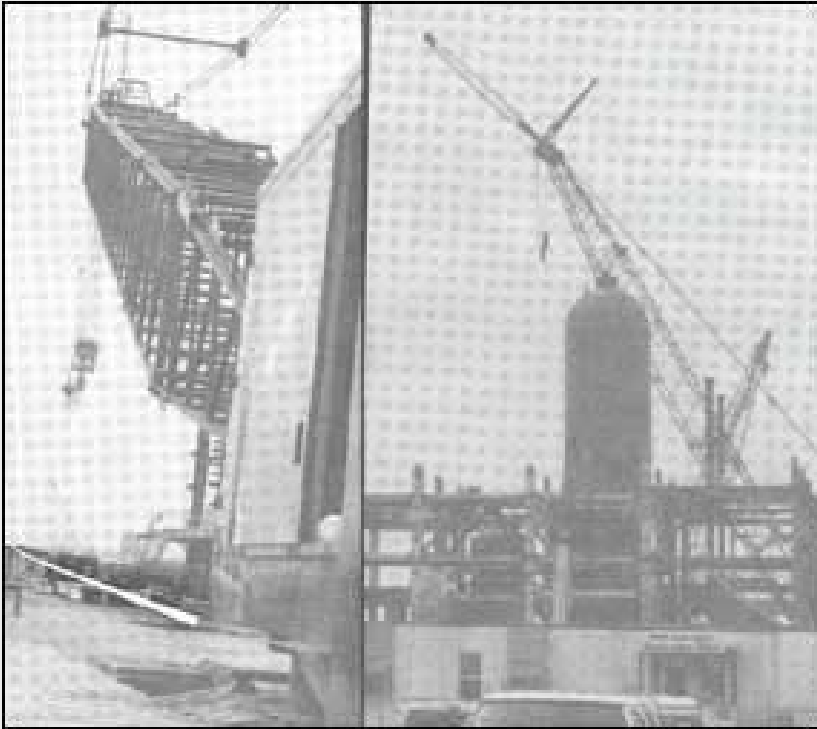


Fall protection

- Part CC has its own fall protection requirements
- 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.



Safety Devices and Operational Aids



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

Operational aids

- Operational aids are required *but* temporary alternative measures are allowed while operational aids are being repaired
- Category I operational aids and alternative measures
 - Boom hoist limiting device, if not working:
 - Boom angle indicator or
 - Mark the boom hoist cable
 - Luffing jib limiting device
 - Anti two-blocking device.
- Replacement of parts: Must be repaired within 7 days of discovery of deficiency



Operational aids

- Category II devices
 - Boom angle or radius indicator
 - Jib angle indicator
 - Boom length indicator
 - Load weighing devices
 - Outrigger/stabilizer position sensor/monitor
 - Hoist drum rotation indicator.
- Replacement of parts: Must be repaired within 30 days of discovery of deficiency.
- Exception: employer has documented that it ordered the part and then repaired the equipment within 7 days of receipt of the replacement part.

Change made since proposed rule

- 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))



Tower Cranes: Supplemental Requirements



Some supplemental tower crane requirements

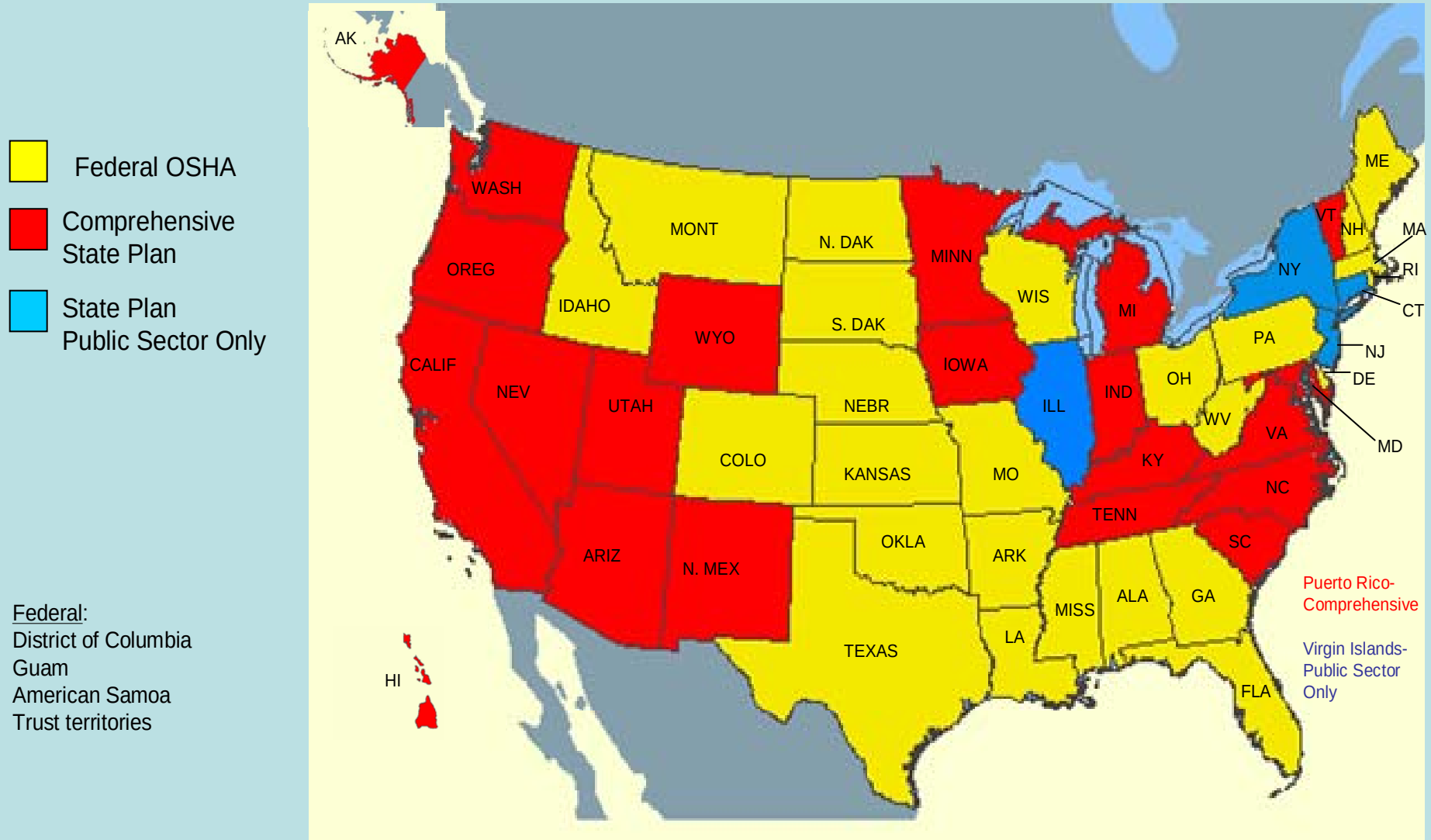
- Foundations & structural supports
 - Design & inspection
- Plumb tolerance
 - Specification & verification
- Climbing procedures
 - Host structure strength verification
 - Wind
- Post-erection load test
- Monthly inspection:
tower mast bolts, upper-most tie-in, braces, floor supports,
floor wedges



Required documentation

- Monthly & annual inspection reports for the equipment and wire rope
- Modifications that affect the safe use of the equipment
- Operator and signal person qualifications
- Tower crane foundation/support design
- When repairs or adjustments of the equipment are needed
- Employer-developed procedures (i.e., assembly/disassembly, operational, and other procedures related to the safe operation of the equipment)
- Power line encroachment procedures/plan

State Plan States



State Plan States

- States must set job safety and health standards that are “**at least as effective as**” comparable federal standards.
- Although most states adopt standards identical to federal ones, there is some flexibility. Therefore, cranes and derricks standards may differ in states operating their own plans.
- Some states already have their own cranes and derricks standards in place. Their regulations must be “at least as effective as” the federal standard.
- Go to www.osha.gov/dcsp/osp for more information on state plan states.

Worker Participation

- The participation of workers is a vital component of any workplace injury and illness prevention program; workers are the best eyes and ears for identifying hazards. Workers must be trained on the hazards they face and ways to prevent the hazards.
- 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

- 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/>

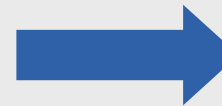


URS Safety by Design Webcasts



- Attendance must be recorded on GSMART by the GSMART **Site** Administrator. Make sure your Site Administrator knows you attended.
- If you don't know your Site Administrator, contact your GSMART **Group** Administrator, listed on the ES&H page.

GSMART Database



URS Feb 02 2:02 PM - NYSE:URS +43.77 (+0.80) Virtual Office Search

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Environmental, Safety and Health
 Safety by Design

URSWD launches the Global Safety Management and Record Tracker - G-SMART.

The G-SMART is a web based application for tracking and trending safety related information at all organization levels. Secure, password protected login is available from any computer that has Internet connection, allowing ESH professionals who are registered in the system access to the database from anywhere in the world.

Modules are available to store Incidents and Accidents, Training, Corrective Actions, Lessons Learned, Agency Visits, and additional modules are under construction for use in the near future. The system has powerful reporting capabilities integrating workers compensation reporting, OSHA reporting, monthly reporting, and incident trending all in one location. In addition, the reporting tool allows easy access to incident records and rates and can export tables and graphs into Word Documents, PowerPoint presentations and other formats.

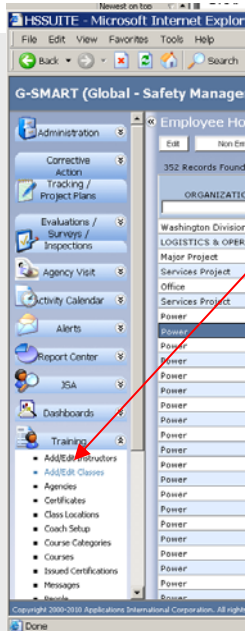
A unique Dashboard feature (Example Below) offers a fast and simple method to compare ESH goals at any organization level and is completely customizable by the user.

Example

For access to the system, please contact your ESH Manager or your G-SMART Group Administrator.

Group	G-SMART Group Administrator
Energy & Construction HQ	Margaret Phelps
Industrial Process	Mike Nicholson Scott Sewing Scott Benson Marcia Kuusner Sandy Monday
Infrastructure & Mining	John Ischam Joel Atchison Doug Helbert Susan Gould Chuck Pryor Cindy Caskey
RUST	Ron Cross Janet Glover Charlene Green
Power	Neil Gunter Ann Schubert Roseanne Villazu
Service Centers	John Ischam Susan Gould
E&E	Patricia Allen Thomas Thome

Entering Participants into GSMART



In GSMART, open Training Module, Select “Add/Edit Classes”

Then, find the class called “**Cranes and Derricks: The New Rule**” for the date viewed, click “Edit,” and add the participants who completed the class.

Important: ensure the “Location” is “Webcast”

LOCATION	COURSE NAME	CLASS DATE	START TIME	END TIME
Webcast	Work Planning (URS Safety by De 1/19/2010	1/19/2010	9:00 AM	10:00 AM
HOUSTON	Work Planning (URS Safety by De 1/7/2010	1/7/2010	10:00 AM	11:00 AM
Texas Toll Roads (O&M) (1926)	Work Planning (URS Safety by De 1/7/2010	1/7/2010	10:00 AM	11:00 AM
Tech Center (1084)	Work Planning (URS Safety by De 12/7/2009	12/7/2009	10:00 AM	11:00 AM
Boise Office (Inf) (1928)	Work Planning (URS Safety by De 1/7/2010	1/7/2010	9:00 AM	10:00 AM
Florida Toll Services (1923)	Work Planning (URS Safety by De 1/7/2010	1/7/2010	11:00 AM	12:00 PM
Hudson Bergen O&M (1924)	Work Planning (URS Safety by De 1/7/2010	1/7/2010	11:00 AM	12:00 PM

Note: Right after the class the system might run slowly if many Administrators are entering participants. If so, please return to the GSMART later to enter participants.

We are working to ensure you can find all participants even if they work in a location you don't have access to. For assistance, contact your Group Administrator.

Tentative Class Schedule



Classes start promptly at 11:00 am ET, 10:00 CT, 9:00 MT, 8:00 PT

- November 9: Cranes and Derricks: The New Rule, by Rick Callor
- November 11: Repeat of Cranes and Derricks: The New Rule, by Rick Callor
- December 7: Neil Gunter: URS Behavior Based Safety Program Overview, Part 1
- December 9: Repeat of Neil Gunter: URS Behavior Based Safety Program Overview, Part 1
- December 14: Neil Gunter: URS Behavior Based Safety Program Overview, Part 2
- December 16: Repeat of Neil Gunter: URS Behavior Based Safety Program Overview, Part 2
- January 4: Safety Trained Supervisor Test and Recertification Review Part 1 by Rick Callor
- January 6: Repeat of Safety Trained Supervisor Test and Recertification Review Part 1 by Rick Callor
- January 11: Safety Trained Supervisor Test and Recertification Review Part 2 by Rick Callor
- January 13: Repeat of Safety Trained Supervisor Test and Recertification Review Part 2 by Rick Callor



URS Energy & Construction

Environmental, Safety, Health, and Security

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Safety Hotline: 866-625-6523