

U.S. Department of Labor
Occupational Health and Safety Administration

Cranes and Derricks Negotiated Rulemaking Advisory Committee

Draft Meeting Summary - January 5-7, 2004

Agenda Review

C-DAC members reviewed and accepted the January meeting agenda.

Review and Approve December 3-5 Meeting Summary

C-DAC members reviewed the December 3-5 draft meeting summary and made two editorial changes. It was approved as final and will be available through the OSHA docket.

Welcome by the United Brotherhood of Carpenters and Joiners of America

William Irwin, Executive Director of the Carpenters International Training Fund, welcomed the Committee to the Training Center.

Discussion of New Issues

C-DAC discussed the following new issues: Operating Near Power Lines; Safety Devices related to Operating Near Power Lines; and Derricks.

Operating Near Power Lines

C-DAC members discussed a range of strategies for protecting workers operating near power lines including strategies to: 1) Eliminate the Hazard; 2) Avoid the Hazard, including identifying and understanding the hazard, controlling crane movement near the prohibited area, warning systems, improving visibility of the power lines, and improving visibility of the prohibited area around the power line; and 3) Protecting Against Injury from Contact. In addition, the Committee discussed problems that contribute to electrocution accidents; possible approaches for the rule, and reached an agreement in concept for addressing the issue of operating cranes near power lines.

Protecting workers operating near power lines: Below is the list of strategies identified.

ELIMINATE HAZARD

- De-energize and ground power lines
- Re-route power lines for long-term jobs

- Maintain absolute clearance for crane with boom fully extended

AVOID HAZARD

Identify and understand hazard

- Pre-planning meetings
 - Advanced site planning - walk the site, meet with power company to identify potential hazards, voltage of power lines, possibilities for moving, grounding, de-energizing, insulating and marking, etc. of the lines
 - Require power company to respond to crane operator requests for advanced planning meetings (already required by some states)
 - Require pre-lift meeting and pre-lift trial whenever crane may get close to prohibited area
 - Hazard analysis
- Require close-proximity permit process when work must be done in “trigger zone”
- Crane Operator Training
 - Including aids that show operators what happens with different levels of power lines, for example, in railroad industry
- Crew Training or Crew Awareness
- Require set policy and procedure for operating near power lines
- Accountability of crane operator, supervisors through a “zero tolerance policy” where an accident leads to termination of person responsible
- Decals on crane
- Require controlling contractor to take responsibility for pre-planning- as part of responsibility to provide adequate site conditions
- Strike alarm recorder (incentive for operator to avoid contact)
- Survey information on location (and height?) of power lines
- Use of GPS systems to identify location of power lines

Control crane movement near the prohibited area

- Maintain clearance of specified distance (currently 10 ft, perhaps increase)
- Barricade area near power lines
- Restrict crane operations to pre-determined safe zone
- Swing limitation device (more complicated for mobile cranes, but still possible)
- Safety buffer area surrounding the prohibited area – entry into the safety buffer area would trigger additional precautions

Warning systems

- Range control
- Audio proximity alarms
- “Banger beams” – rope placed in front of power lines, which gets hit first
- Signal person
- Dedicated spotter
- Strobe lights – lights in front of power lines, gets triggered when near line

Improve visibility of the power lines

- Marking/signage of power lines – for example, using engineers’ tape
- Tag the lines
- Erect signs (35-40 feet) in front of power line that signals the hazard

Improve visibility of the prohibited area around the power line

- Mark the prohibited distance on the ground
- Accurately measure distance from power line – for example, using sonar
- Lay out caution tape at 150% of the safe distance from the power line

PROTECT AGAINST INJURY FROM CONTACT

- Insulating links
- Other insulation/ non-conductive rigging between hook and load
- Isolate the load using non-conductive tag lines
- Barricade around crane (keep employee from touching crane)
- Ground the crane
- Insulate/Blanket the line – to keep crane from actually touching line

Problems that contribute to electrocution accidents: C-DAC members discussed the problems that contribute to electrocution accidents. Below is the list of contributing factors identified by C-DAC members.

- Pressure on operator to “push the envelope” on distance from power line
- Operator doesn’t know the line is there
- Operator knows the line is there but forgets or can’t see it (blends into background, early evening)
- Operator knows the line is there and can see it but can’t judge the distance correctly
- Not enough time before start of job to do pre-planning or to walk the site
- No one working near crane knows how many volts are going through the line
- Power companies are not cooperative
- Operator complacency and lack of awareness

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- Human error is inevitable
- Increased use of engineering controls could lead to decreased operator awareness and attention to hazards
- Failure to use a spotter
- Contractor-installed temporary power lines
- Concerns about the cost of precautions
- Operation under the lines to pick up load (which may be under lines or on other side)
- Storing material near power lines (because this is a non-operating zone)
- Unexpected boom movement / boom “drift”
- (Lack of accurate survey information on power line placement and height
 - Uncertain nature of survey information due to ground changes

Possible approaches for the rule: In developing the regulations, C-DAC members identified some possible approaches for framing the discussion of operating near power lines. These options included:

- Require multiple levels of protection
- Keep law as is, and focus on increasing compliance through enforcement and training
- Modify existing OSHA regulations to be consistent with B30.5 2000
- List some possible safety devices in the rule (as information, not requirements)
- Require strategies to address the various components of the problem

Agreement in Concept

Ultimately, C-DAC members agreed in concept to identify different risk zones and to require different safety strategies within each zone. For purposes of discussion, the Committee referred to red, yellow, and green zones. The “red zone,” the area of greatest risk of contact with a power line, will require multiple safety measures. The “yellow zone” will identify the area outside the red zone within which there is risk of a part of the crane breaching the minimum distance from the power line. Within this zone, multiple strategies will be employed after selection from a menu of possible strategies. The green zone will identify the area within which there is no risk of crane contact with a power line. The Committee considered several options for the size of each zone, and will work to determine the parameters of each.

In all instances, the regulation will require a determination of the proximity of power lines to crane activity. Once power lines are determined to fall within the red or yellow zones, which may require knowing the voltage of the lines, additional activities will be required.

Safety measures for the “red zone”: The safety measures required in the red zone, except when following them would create a greater safety hazard, will include:

- 1) **Pre-planning meeting** with power line owners to determine if the hazard can be eliminated, that is, the power lines de-energized and grounded. If this is infeasible, then the meeting will lead to procedures for assuring worker safety.

The Committee will continue to discuss how to ensure that power line owners respond to meeting requests in a timely manner, whether to require power line owners to be present during lifts in the “red zone,” and whether someone besides a representative of the utility can ground the crane or load line.

- 2) **Safety measures**: The Committee agreed to require safety measures where the power line is not de-energized, including proper grounding of the crane, barricading the work zone, a non-conductive insulator between the hook and load, conduction-resistant rigging and tag lines, and a visual aid and communication device. The standard will also clarify the difference in protection provided by insulating snakes or boots on the power line, insulated barriers in front of the power lines, and the actual installation of insulated power lines.

Safety measures for the “yellow zone”:

The safety measures required in the yellow zone, except when following them would create a greater safety hazard, will include:

- 1) **Pre-lift meeting** of the crew to identify the location of power lines and strategies for avoiding them;
- 2) **Safety Mechanisms**: Employers will choose from a “menu” of safety measures, including a method for preventing contact with power lines such as a signal person, proximity warning, range control device, GPS system or other technology that may become available; clear marking of power lines and “red zone” boundaries, barricading around the power line, and safety devices to reduce risk of electrocution if the crane does touch the power line. The Committee will continue to

discuss the number of "menu" items that will be required in the "yellow zone."

"Red Zone" Size: Several distances from the power line were considered, including the current minimum of 10 feet for 50kV, and other the distances used to identify the "prohibited zone" in B30.5 2000; a flat distance of 15 feet; or a flat distance of 20 feet. Some members were concerned that a minimum distance of 10 feet for 50kV lines was too small. The Committee agreed that the area underneath power lines would always be considered the "red zone."

"Yellow Zone" Size: The Committee identified the "yellow zone" as the work area outside the "red zone" in which it would be possible for some part of the crane or load to enter the "red zone." C-DAC members considered requiring a distance plus the full length or working length of the boom and/or luffing jib, and load to be the outer limit of the "yellow zone," beyond which a crane could work without any power line related safety measures. The Committee considered adopting the distances used in B30.5 2000, which vary with power line voltage. Some suggested using the "worst case" of 45 feet plus the full length or working length of the boom and/or luffing jib, which is the distance given by B30.5 for the highest voltage lines.

Relying on operators' judgment vs. safety devices: In discussing how to reduce the risk of power line accidents, some members thought that relying on safety devices could lead operators to depend on the devices over their own good judgment, even though the devices could malfunction. Others thought that safety devices were necessary to protect against possible errors in judgment. All agreed to consider a combination of both types of safety measures, which will provide multiple layers of protection.

Training: Committee members discussed how operator training could increase operator awareness of power line hazards and safety strategies. Many members consider training a key component in reducing electrocution accidents. Suggestions for training requirements will be discussed during the Power Lines work group conference call.

Working in the dark: C-DAC members discussed the inability to identify power line locations, and therefore the "red zone," when setting up or operating in darkness or low light. These situations will be discussed in the Power Lines work group conference call.

Transit near power lines: Electrocutation accidents are less likely when the crane is in transit, according to many Committee members. Safety measures for traveling near power lines will be discussed during the Power Lines work group conference call.

Exceptions: A number of potential exceptions to the “red zone” and “yellow zone” requirements were raised, including situations where a crane could be considered to be in the “yellow zone,” given its swing radius, but is working exclusively outside the “yellow zone.”

In addition, the question of an exemption for electrical workers from the safety standards required for work in the red zone was raised. Electrical workers always work in the “red zone,” and have stringent practices for worker protection. However, it is unclear whether an exemption is necessary, given that current practices may exceed the safety measures being considered for the “red zone.”

Derricks

Presentation on Derricks: Douglas Smith, of Chicago Bridge and Iron, presented on derricks and hoists, including guyless derricks and stiff leg derricks. Key differences between cranes and derricks include the need to constantly readjust the rigging, to inspect each rope after the ropes have been slackened, and to have a “lift director” supervise lifts. He also stated that although hoists are not included in the scope of the crane and derrick rule, hoists used for derricks should be included because they are part of the necessary rigging.

Issues to be addressed by workgroup: A workgroup conference call will be held to further discuss regulations needed to address requirements specific to derricks. OSHA will work to draft regulatory language for derricks.

Public Comment

Hugh Pratt, of Insulatus, Inc. presented on his company’s insulating link, and its ability to prevent electrocution accidents by stopping the flow of electricity through the load line.

Allen Papcsy of Miller Products stated that insulating link technology has improved over time while their price has decreased.

Bruce Moore, father of Rory Moore, spoke about the death of his son, Rory Moore, who died after touching electrified rigging while working on a construction site. He asked the Committee to ensure greater safety for

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employees working with cranes near power lines and to require insulating links, which would have saved Rory's life.

Kevin Cunningham, of Special Risk Services Group, explained that his company requires that three parties be in constant communication for projects involving power lines. He also stated that the current regulations are insufficient to prevent electrocution accidents, and asked that OSHA increase enforcement and monetary fines for violations.

Jim Andrews, of Fred Weber, Inc., discussed the importance of safety devices in preventing electrocution deaths.

Douglas Smith, of Chicago Bridge & Iron, described safety measures to avoid power line contact, including hazard analyses and approval requirements when cranes will be closer than five feet to power lines.

Larry Brumbaugh of Hunt Construction Group stated that checklists for general contractors reduced the safety risk of operating near power lines.

Thomas Broderick, of the Construction Safety Council, described his organization's research on best practices for working near power lines including a survey of employers' knowledge of power line danger, in which they found the risk was largely underestimated. He described the "power line awareness permit" created by his organization, which is a pre-lift aid documenting the placement of power line hazards at a given site and the safety measures taken to prevent contact with power lines.

Lance Burney, of Sigalarm, described his company's proximity warning alarm safety device. He explained that the sensitivity can be adjusted and that the price of safety devices has generally decreased.

Jennifer Moore, mother of Rory Moore, spoke about the pain of dealing with the death of her son, who died in a preventable accident. She asked the Committee members to help her find justice for her son's death, in part, by requiring insulating links on cranes.

Joseph Alexander, Jr., of Mithoff & Jacks, LLP described the legal case brought by the Estate of Rory Moore, and emphasized the need for insulating links. He discussed the Texas law that requires insulating links on all cranes, but which has no means of enforcement.

Ernie Brown of Pouk & Steinle, Inc., Scott Pendergrast of Rocky Mountain Contractors, Inc., Ward Andrews of Wilson Construction Company, and Jules Weaver of Western Line Constructors, presented on the electric power industry's use of cranes. They described the safety measures they employ when working on or near power lines, and explained that because they always work in the "red zone" and have developed their own practices for preventing accidents, they should be exempt from the power line safety measures of the crane safety standards.

Next Steps

Documents: The December 3-5 meeting summary will be revised as discussed and distributed as final. The facilitators will draft the meeting summary for this meeting and distribute it prior to the February meeting.

Power Lines work group conference call: To be held on Wednesday, January 28, from 1:30 - 3:00 pm EST.

Derricks work group: will be established to assist OSHA in developing draft regulatory text for the derricks section of the standard.

Scheduling of additional issues: C-DAC members have scheduled discussions of the following additional issues to accommodate members of the public that want to be present for particular issues. Additional issues are likely to be discussed at these meetings as well.

February: Verification criteria for the structural adequacy of crane components; Cranes on barges; Pile drivers panel; Safety devices (excluding those related to power lines); Hoisting personnel (boom tip baskets).

March: Overhead & Gantry Cranes

Panels: Panels on verification criteria, cranes on barges, and dedicated pile drivers will present during the February meeting.

C-DAC Attendance - January 5-7, 2004

Present:

Stephen Brown, International Union of Operating Engineers
Michael Brunet, Manitowoc Cranes, Inc., Crane Manufacturers (AEM/CIMA)
Stephen P. Charman, Viacom Outdoor, Inc., Outdoor Advertising Association of America (OAAA)
Joseph Collins, Zachry Construction Corporation, American Road and Transportation Builders (ARTBA)
Noah Connell, U.S. Department of Labor/OSHA
Peter Juhren, Morrow Equipment Company, L.L.C.
Bernie McGrew, Link-Belt Construction Equipment Co
Larry Means, Wire Rope Technical Board, ASME
Brian Murphy, Sundt Construction, Associated General Contractors (AGC)
George R. "Chip" Pocock, C.P. Buckner Steel Erection, Steel Erectors Association of America
David Ritchie, The St. Paul Companies, Training and Testing
Emmett Russell, International Union of Operating Engineers
Dale Shoemaker, Carpenters International Training Center
William Smith, Maxim Crane Works
Craig Steele, Schuck & Sons Construction Company, Inc., National Association of Home Builders (NAHB)
Darlaine Taylor, Century Steel Erectors, Co., Association of Union Constructors
Wallace Vega, III, Entergy Corporation, Inc.
William J. "Doc" Weaver, National Electrical Contractors Association, Inc.
Robert Weiss, Cranes Inc. and A.J. McNulty & Company, Inc., Allied Building Metal Industries
Doug Williams, Buckner Heavylift Cranes, Specialized Carriers and Rigging Association
Stephen Wiltshire, Turner Construction Company, Associated Builders and Contractors
Charles Yorio, Acordia
Susan Podziba, Facilitator, Susan Podziba & Associates
Alexis Gensberg, Facilitator, Susan Podziba & Associates

Absent:

Frank Migliaccio, International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers