

THE NEW CRANE STANDARD

By Molly O'Brien

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Summary

While cranes and derricks do make the movement of heavy materials much easier for workers, many safety hazards are associated with their use. In fact, almost 30% of fatal injuries in the construction industry involve the use of cranes. In August of 2010, the Occupational Safety and Health Administration overhauled the outdated crane standard and replaced it with a new standard for cranes and derricks in construction.

OSHA published the original standard for cranes and derricks back in 1971, soon after the inception of the agency. Since then, the standard has undergone two small revisions: once in 1988 to address the use of personnel platforms and again in 1993 to make sure that employees are kept clear of loads being lifted or carried by cranes. The new standard for cranes and derricks in construction was published by OSHA in August of 2010 and is found in Subpart CC of 29 CFR 1926. Subpart N, which previously contained OSHA's the crane standard, is now used for helicopters, hoists, elevators, and conveyors. Matthew Shaw explained in April 2011's *Construction Equipment* that the new crane standard is essentially an "extensive overhaul of previous regulations, they are also, in many ways, common sense solutions to existing problems." The goal of this new standard, as with all other OSHA standards, is to reduce workplace accidents and fatalities.

The new standard covers most equipment used in construction that is designed to lift and move a suspended load. It applies to all construction industry employers who use cranes and derricks. Employers on construction sites where cranes and derricks are used must also be familiar with the new standard in order to understand their responsibility and the potential hazards. Those who provide operators and/or maintenance personnel with cranes also have obligations under the new standard.

Necessity for New Standard

At the time OSHA's new crane standard went into effect, crane and derrick accidents were responsible for the deaths of an average of 100 people each year. Aside from the fact that the previous standard had, for the most part, remained unchanged for over 40 years, the high rate of fatalities from crane accidents along with several high profile investigations underscored the need for an updated standard. OSHA's Advisory Committee on Construction Safety and Health recommended that OSHA update its crane standard. The administration recognized there were hazards associated with operating a crane or working in proximity to cranes which necessitated the establishment of a new standard with more specific and up to date requirements for the safe use of cranes in the construction industry.

Changes in New Crane Standard

In order for employers to comply with the requirements set by the new standard, they must understand what has changed from the old standard and why. A whole host of technological advances in equipment, work processes, communication, etc. have changed many aspects of construction work over the years. Because the original standard was developed so long ago, technological advances were not taken into consideration and could not have been anticipated. For example, when the original crane standard was developed, cell phones did not exist. In the new standard, OSHA addresses cell phone usage by specifically prohibiting the use of a cell phone by a crane operator during a lift unless it is being used for signaling. Under the new standard, most crane operators will be required to be formally qualified or certified by November 10, 2014. In addition to more stringent training and certification requirements for crane operators, the new crane standard

contains updated safety requirements, methods and practices for cranes and derricks, some of which are summarized below.

The scope of OSHA's new crane standard was expanded from the old standard to include knuckle boom cranes, except when they are used for the delivery of ground material, sheet goods or packaged material and placing on structure using cradle or forks. The new standard also excludes loaders, excavators, and similar equipment used for lifting. In the new crane standard, OSHA has elaborated on certain terms which could have been ambiguous before. The definition of "crane" now extends to multipurpose machines when these are being used to hoist or lower materials, i.e. overhead gantry cranes, service trucks and forklifts. The definition of a fall zone has been added to 29 CFR 1926.1401. A fall zone is defined as the area in which it is reasonably foreseeable that partially or completely suspended materials could fall if an accident should occur. The term "qualified person" was also added to section 1401. OSHA defines a qualified person as someone who, "by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience has demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project". The definition of a "qualified rigger" was added to the new crane standard. A qualified rigger is a rigger who satisfies the definition of a qualified person.

Because the most frequent cause of crane-related fatalities is electrocution by contact with power lines, the new standard contains more rigid requirements for maintaining sufficient clearance distances from power lines. Prior to operating a crane near power lines, the employer is required to identify the work area. Once identified, the employer must set a boundary around this area in order to prohibit the crane operator from going outside of the specified work area. Once the work area has been identified, the employer is then required under Subpart CC to determine how close any

part of the equipment, load line or load, might get than from the power line at its maximum working radius to ensure proper clearance. If the line is less than 350 kV, no part of equipment may come within 20 feet of the power line. For power lines over 350 kV, the required clearance is 50 feet. The previous crane standard required a minimum clearance of 10 feet for power lines up to 50 kV. Lines rated over 50 kV previously required a clearance of 10 feet plus 0.4 inch for each 1 kV over 50 kV or twice the length of the line insulator was required. If it is determined that there is a possibility that any part of the crane or its load might not keep the required clearance with the power lines at its maximum working radius, there are alternatives provided under the new standard. First, the employer can obtain confirmation from the utility company that the power line has been de-energized and visibly grounded at the worksite. If the power line cannot be de-energized or confirmation is not available, the employer's next option is to make sure that no parts of the equipment, load line or load could come within the required clearance by implementing the required encroachment prevention precautions listed in 1926.1408(b) (*CFR 1926 Subpart CC*, 2010).

Under the new crane standard, if the exact voltage of the line is known, the employer is permitted to implement the required encroachment prevention precautions to prevent encroachment into the minimum approach distance provided in Table A of 1926.1408. The minimum approach distance for any live power line up to 50 kV is 10 feet. Lines over 50 kV but less than 200 kV must maintain a minimum approach distance of 15 feet and lines over 200 kV up to 350 kV must maintain a distance of 20 feet. A 25 foot minimum approach distance must be kept for lines over 350 kV but less than 500 kV (*CFR 1926 Subpart CC*, 2010).

The second leading cause of crane-related fatalities in the construction industry after electrocution is the assembly and disassembly of cranes. OSHA addressed several specific hazards associated with assembly and disassembly of cranes in the new standard in an effort to protect

workers from injury or death by being struck or crushed by the unexpected movement of crane parts.

Manufacturer or employer procedures for the assembly and disassembly of cranes must be followed. If using employer procedures, these must be developed by a qualified person. In addition, the new standard requires rigging to be done only by a qualified rigger. Synthetic slings during assembly or disassembly must always be used per crane and sling manufacturer instruction.

In section 1402 of the new crane standard, OSHA assigns the responsibility of all crane ground conditions to the controlling employer. Dennis Burks explains in a *Professional Safety* article that OSHA defines the controlling employer under its multi-employer worksite citation policy as the prime or general contractor, construction manager or any other legal entity which has the “overall responsibility for the construction of the project -its planning, quality and completion.” The standard specifically prohibits the assembly or operation of a crane unless the ground underneath is firm enough to support the weight of the crane and all of its parts, and graded (with the use of supporting materials) to meet the the equipment manufacturer’s specifications for adequate support and the degree of levelness.

Under the new crane standard, crane operators must follow the crane manufacturer’s instructions for operation of the equipment. Simply stated under this section of the standard, loading the crane beyond its capacity is never allowed. The operator of the crane is required under the new crane standard to verify the weight of the load and load capacity for the crane and its parts.

Frequent and regular inspections of the crane and work area are essential to detect any defects or potential safety hazards. The requirements for crane inspections are found in 29 CFR 1926.1412. Repaired, adjusted or otherwise modified cranes must be inspected by a qualified person before use. Cranes must also be inspected by a qualified person after assembly before the crane is

put into use. If a crane has been out of use for three months or more, it must be inspected prior to use. Shift inspections by a qualified person, which include looking at the levelness of the crane, are required under the new standard. While not mandatory for the shift inspections, written records must be maintained for monthly inspections annual inspections which have been conducted by a qualified person. These must be made available for subsequent inspectors. OSHA requires in its new crane standard that all cranes contain certain safety devices to ensure the crane remains level and if there is a problem, that the operator is able to quickly alert workers in the area. Operating a crane without these safety devices is prohibited. At a minimum, these include: level indicator (built in or portable) and a horn which is immediately available to the crane operator. Older cranes must comply with the requirements of the applicable ASME B30 volume in effect at the time the crane was manufactured.

Fall protection requirements for cranes are clarified in the new standard. For example, cranes with lattice booms manufactured after November 8, 2011, must be equipped with walkways on the booms if it has a vertical profile of six feet or greater. Under the new standard, employers must provide fall protection for employees who are working in proximity to an unprotected side or edge which is more than six feet above a lower level when moving point-to-point, working on non-lattice booms, working on lattice booms that are not horizontal and working on horizontal lattice booms with a fall distance of 15 feet or more.

Another requirement set by the new crane standard is that a qualified signal person must be used anytime the crane operator is not able to maintain a full view of the load area, the travel view is obstructed, or the operator of the crane determines a signal person is necessary. The new crane standard requires this signal person receive documented training in order to be considered “qualified.”

Big Blue Crane Collapse

A prime example of why employers as well as crane operators must take responsibility for ensuring compliance with the requirements listed above can be seen in the tragic collapse of the Big Blue crane in 1999.

On July 14, 1999, a heavy lift crane known as Big Blue was hoisting a section of roof near the completion of the construction of the Miller Park Stadium in Milwaukee, WI. As the section of the roof was being lifted, Big Blue collapsed and struck the platform where three ironworkers were standing, causing all three to fall to their death.

It is believed that environmental factors such as heavy winds and inadequate soil conditions contributed to Big Blue's collapse. Wind speeds on the day of the accident exceeded the rating for the crane, which was set by the manufacturer. The crane was also not level at the time of its collapse as it had sunk about a foot into the soil earlier in the day. There are many unfortunate lessons to be learned from the collapse of Big Blue, two of which have been clearly addressed in OSHA's new standard. The first is that if the manufacturer's operating instructions and wind rating were followed as required in 29 CFR 1926.1417, the crane would not have been operating that day. Secondly, the controlling employer on the jobsite is clearly given the responsibility for crane ground conditions under the new standard. The controlling employer is required to prohibit the operation of a crane with inadequate soil conditions, which they failed to do in the case of Big Blue on the day it collapsed. At that point the crane had sunk about a foot into the soil.

While equipping the crane with a horn might not have saved the ironworkers because they would not have had time to get off the platform before being struck by the crane, a level indicator

would have alerted the operator of the crane that it was not in a level position and therefore, not safe to operate because of the heightened potential to tip over or collapse.

Although compliance with the previous crane standard would have likely prevented the collapse of the Big Blue, the accident would certainly not have occurred if the controlling employer and crane operator were in compliance with the requirements in OSHA's new crane standard. In the new standard, OSHA requires that if the crane operator has any safety concerns, that operator must have the authority to stop operation and prohibit the lift until a qualified person determines it is safe to proceed.

Future of the Crane Standard

As mentioned, OSHA's new crane standard provides updated safety requirements, methods and practices for cranes and derricks with the purpose to "protect employees from the hazards associated with hoisting equipment when used to perform construction activities." Even though the standard is just two years old, OSHA administrators have shown they will continue to revise the standard if necessary.

OSHA issued a final rule on August 17, 2012, which applies the requirements of the new crane standard (Subpart CC) as discussed above to demolition and underground construction. This will eliminate the separate cranes and derricks standard that currently applies to demolition and underground work (Subpart DD) and streamline the requirements for contractors who are involved in demolition and/or underground work in addition to regular construction work. The final rule became effective November 15, 2012.

Conclusion

While workers in the United States are currently experiencing the lowest rates of workplace injuries and fatalities ever recorded, crane-related accidents have continued to be the leading cause of fatalities within the construction industry. Many factors contributed to OSHA's development of a new standard for cranes. This standard addresses some of the specific hazards which were not included in the original standard.

Ensuring compliance with the requirements in the new crane standard will put pressure on affected employers and crane operators. According to Tony Anderson's article in *The Daily Reporter*, it is estimated that approximately 267,000 employers of around 4.8 million employees were affected by the new standard in some way. In a *Professional Safety* article from 2011, Guy Snowdy explains that the changes in OSHA's new crane standard have already proved overwhelming and expensive for many employers in the construction industry.

Because the new crane standard has only been in effect for just over two years, sufficient data is not yet available to determine the full extent of its effectiveness in the prevention of crane-related injuries and fatalities. Before the new standard was published, David Michaels, assistant secretary of labor for OSHA, was hopeful that implementation of the new standard would prevent at least 20 fatalities each year and save about \$55 million per year, according to the Anderson article. (Anderson, 2010).

What is clear is that the workplace has seen a significant reduction in workplace injuries and fatalities since the inception of OSHA. If the trend applies the same way to the new crane standard, the construction industry can look forward to a decrease in crane-related accidents.