Overhead Hazards Stats and Facts

DID YOU KNOW?

According to the CDC's NIOSH, the construction industry comprises approximately 8% of the U.S. workforce, yet it accounts for 44% of job-related fatalities. Consider the statistics:

- Electrical hazards cause more than 300 deaths and 4,000 injuries each year among the U.S. workforce.
- Electrocution is sixth among causes of workplace deaths in America.
- Construction trades, and installation/maintenance/repair professionals are the top two groups suffering the most fatal electrocution work-related accidents, from 2003-2007.

Electrocution accidents involving heavy equipment

The construction industry represents 52% of all occupational electrocutions, according to the recent CDC study referenced above. Below are some statistics on the heavy equipment in the trades and related electrocution accidents:

- Heavy equipment events accounted for 50% of those overhead power contacts, with cranes comprising 56.5%, drilling rigs 7.7%, dump trucks 6.7%, bucket trucks 6.7% and backhoes 4.9%.
- Carried items comprised 20.5% of overhead line contacts, ladders 12.9%, scaffolding 2.2%, and direct human contact another 10.2%.
- More than than 90% of power line contact accidents involved overhead distribution conductors.
- Drop-down services from power poles to houses, and high power transmission lines connecting generating stations to substations, only resulted in 7% of workplace power line

accidents.
- Labor trades with considerable risk, in addition to heavy equipment operators, were roofing/siding/sheet metal contractors (9.3%), tree trim contractors (8.5%), water/sewer/pipeline personnel and communication contractors (7.9%), and painting contractors (7.3%).

Just how many people are injured or killed in electrocution accidents?

It's estimated that 62 agricultural workers/yr. die from electrocution in the U.S., with overhead power lines being the most common source.

And each year, many children and adults are electrocuted or seriously injured in this country due to accidental contact with floating phases, downed power lines or objects such as green wood or fences in contact with downed wires.

The vast majority of these tragic events are preventable, if utility companies use the best available preventive maintenance, inspection, and repair practices that are required by law. They must also attend to hazards resulting from aging infrastructure and components, maintain proper tree trim scheduling cycles and promptly respond to storm damage and direct and indirect knowledge of floating and downed wires.

According to the Electronic Library of Construction Occupational Safety and Health (eLCOSH), exposure to electricity is still a major cause of death among construction workers. Among electricians, the most serious concern is working with or near live wires without enlisting the proper safety procedures. Electrocutions kill an average of 143 construction workers each year. Data from 1992 through 2003 indicates electrical workers suffered the highest number of electrocutions per year (586 or 34 percent of the total deaths caused by electrocution), followed by site laborers, carpenters, supervisors of nonelectrical workers and roofers.

More than half the electrocutions of electrical workers were

caused by direct or indirect contact with live electrical equipment and wiring, including lighting fixtures, circuit breakers, control panels, junction boxes and transformers. In other words, those deaths could have been prevented had proper lockout/tagout and de-energizing procedures been followed.

The Occupational Safety and Health Administration (OSHA), Washington, D.C., estimates there are approximately 350 electrical-related fatalities a year, which roughly equals one fatality per day. In addition, statistics from the National Institute for Occupational Safety and Health (NIOSH), Atlanta, show electrocution is the third- leading cause of death at work among 16 and 17-year-old workers, accounting for 12 percent of all workplace deaths.

In addition, The Bureau of Labor Statistics (BLS) data indicates 2,726 nonfatal electrical shocks involved days away from work a year, between 1992 and 2001, in private industry.

“To the best of my knowledge, there are more than 30,000 nonfatal electrical shock accidents that occur each year, with a lot of incidents going unreported,” said Chris Marquardt, safety director and field superintendent at Lemberg Electric Co. Inc., Wauwatosa, Wis. It is believed, he added, that for every 300,000 at-risk behaviors, there are about 300 recordable injuries, 30 lost-time injuries and one fatality. The cost of each major case of electrical shock can average between $1 million and $4 million.

According to OSHA, the occurrence of the most common injuries is increasing as the scope of work performed by the typical electrical contractor and the age of the work force increases.

Dangers of the job

“The most common injuries that are sustained when dealing with high voltage or when working on a construction site are caused by contact with overhead or underground electrical lines, and falls are the second most common,” said Bob Isiminger, senior electrical engineer in OSHA’s office of engineering safety. Others, he added, include being struck by vehicles, having construction materials

fall on people and being present in or near caved-in trenches. According to James Cawley, P.E., senior research engineer at NIOSH's Pittsburgh Research Laboratory, fatalities most often attributed to contact with overhead power lines were usually from the result of contact through equipment, such as ladders, tools and cranes.

"Nonfatal electrical injures in construction had contact with wiring, transformers, or other electrical components and contact with the electric current of machines, tools, appliances, or light fixtures," Cawley wrote in a report entitled Trends in Electrical Injury, 1992–2002.

Also common when working on medium- to high-voltage installations are back injuries, according to Tom Andrzejewski, CSP, safety director for Hunt Electric Corp., St. Paul, Minn.

"The heavy cable sizes are the cause of most of those injuries. Electrical incidents, however, are rare as trained, experienced electricians understand the dangers of working in this area and take the necessary precautions."

Other common injuries include cuts, nicks, scrapes, slips and knee injuries.

Of repetitive motion injuries or musculoskeletal disorders (MSDs), strains and sprains are usually the most common. "In spite of this, we have not seen a lot of repetitive motion injuries being reported, probably because of the diversity in electrical construction activities," Isiminger said. However, Andrzejewski said shoulder injuries in the industry are an issue because of the repetitive overhead activities inherent in electrical installations. "Such injuries will have a significant impact to the industry as the work force ages," Andrzejewski said.

The danger begins

According to Isiminger, there are a number of causes of common injuries, including failure to address known hazards; or if known hazards have been addressed, failure to remind and retrain employees about them; failure to follow written safety plans on-

site; and the general belief among workers that injury or death can’t happen to them. There is also the cultural attitude among some electricians that they are expected to work on energized equipment because that’s the nature of the job and that the customer needs to maintain production and avoid downtime.

“That can put pressure on electricians to not fully comply with safety codes,” Marquardt said. However, with the increased enforcement of the NFPA 70E standard, these attitudes are gradually changing.

Another cause of injury is when management and field staff are not willing to accept safety as both a corporate and personal value and to commit to the development and implementation of safety practices on the job site.

“Without a safety-minded corporate culture, safety is not considered a factor, and injuries occur,” Andrzejewski said.

Many times, according to Marquardt, injuries occur because workers believe they will be helping the company by taking short cuts in the name of efficiency, such as not wearing safety gear or misusing ladders or other pieces of equipment. “This is a fallacy, of course, because more often than not, that short cut becomes a lost-time event with injury or property damage,” he said.

The very products and tools the electricians are using to perform their jobs frequently cause common cuts and finger injuries. As products continue to become more affordable, some are losing some of their quality. “Electrical panels, lighting fixtures, etc., now come to job sites with sharp edges,” Marquardt said.