The Shocking TRUTH

Experts suggest electrical hazards are easily avoidable, but complacency hinders compliance

By Kyle W. Morrison, senior associate editor

rom lighting our workstations to powering massive industrial machinery, we depend on electricity to get us through the workday. But as necessary as it is for our modern lives, electricity also poses a great hazard – one that some experts contend has been overlooked.

"Electrical safety is the fourth or fifth biggest killer in the U.S., but we've ignored it for years," said Hugh Hoagland of e-Hazard.com, a consulting and training firm based in Louisville, KY.

That may be changing, as the U.S. Postal Service recently discovered. In 2010, OSHA issued at least

\$4 million in proposed penalties to USPS for alleged violations related to electrical hazards. The penalties were spread out over several USPS facilities across the country, prompting OSHA to take an unprecedented step. In July, the agency sought to force USPS to correct electrical violations at all of its



350 facilities – the first time OSHA has attempted such an action.

"When the same safety violation is discovered in multiple locations of an organization, we need an enterprisewide remedy to protect workers from the hazard," Solicitor of Labor M. Patricia Smith said in a press release.

The danger

Many of the alleged violations included workers not being adequately trained or not having appropriate personal protective equipment. Such violations expose workers to possible electrical shock or even electrocution, OSHA said.

USPS said in a statement to *Safety+Health* magazine that it has invested millions of dollars in training and protective

equipment for its workers. "In January 2010, the Postal Service began implementing an electrical work plan to enhance its safe electrical work practices for employees, and the Postal Service believes this plan meets OSHA standards," USPS said. (Although most public entities are exempt from federal

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OSHA jurisdiction, the Occupational Safety and Health Act was amended in 1998 to include USPS as an employer subject to the agency's enforcement.)

The electrical hazards confronting USPS are not limited to that organization. "These issues are common in U.S. workplaces," said Wes Scott, manager of the National Safety Council's occupational safety and health consulting serv-

ices. He noted OSHA standards related to electrical hazards are routinely found in the agency's top 10 most frequently cited standards. (For more, read "OSHA's Top 10," p. 40.)

The real danger with electrical hazards is not simply OSHA punishment. Employees potentially can be exposed to shocks, electrocutions, arc flashes or blasts, fires, explosions, and even falls related to electrical contact.

On average, one worker dies every day from electrical and associated hazards, accounting for about 5 percent of all workplace fatalities, Scott said, citing Bureau of Labor Statistics data.

Dangers exist even at relatively low voltage. "You can be seriously injured by anything over 50 volts," said John Masarick, director of codes, standards and safety, and workforce development for Alexandria, VA-based Independent Electrical Contractors Inc. (Fifty volts is the point at which

Plus www.nsc.org/plus Read OSHA's electrical standard.

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OSHA requires live parts of equipment to be guarded from accidental contact – 1910.303(g)(2)(i).)

With higher voltage, the danger only intensifies. As Hoagland put it: "From 480 volts on up, if you make a mistake ... you don't have a little poof, you've got an explosion." Masarick said an arc flash, in which high-amp currents travel through the air – usually across gaps between conductors – can cause major damage and be "hotter than the sun."

Contract out or train?

With such dangers found in electrical work, employers may wonder what methods are best for avoiding them. Failing to properly train workers can result in OSHA penalties or worse, and some safety precautions, such as using meters to test the absence of voltage, may be difficult for someone to perform without appropriate training.

"In most cases, it's because this is a very specialized training, and your average safety person can't do it," Hoagland

FLASH FACT

OSHA's lockout/tagout standard, which outlines minimum requirements to control hazardous energy, was the fifth most frequently cited violation from fiscal years 2005 to 2009.

Source: OSHA

said. While electrical training is not as compartmentalized as CPR training, to outfit someone on staff with electrical safety expertise is becoming less expensive, and many consensus standard training sessions are straightforward and easy to understand, according to Hoagland.

Even with a trained employee, some projects may be outside his or her area of knowledge. In training e-Hazard

provides, Hoagland said trainees are told, "When in doubt, contract it out."

Electricians, who many states require to be licensed, are trained to know the various codes and standards in their profession. "Electricians are used to regulations, and the field they work in is very technical and can be very dangerous," Masarick said.

Not every company can afford to have an electrician on staff, Masarick said. If the decision is made to hire contractors to perform electrical work, experts caution that risks still remain.

Hoagland cautioned that contracting jobs out does not remove liability from the employer if something goes wrong. Scott added that under OSHA's multiemployer worksite policy, an employer can be cited for OSHA violations made by its contractors if the employer's workers are exposed to the hazard. He recommended employers take steps to protect their workers from all hazards, regardless of who created them.

Feature at a Glance

Electrical hazards are one of the top causes of workplace deaths, and violations of electrical standards routinely make OSHA's list of top cited violations. With OSHA clamping down on enforcement, what should employers do to keep their workers safe and their businesses compliant regarding electrical hazards?

Key points

- Complacency is a major danger when working around electricity.
- Equipment should be de-energized before work is performed, and appropriate protective equipment always should be used.
- Not only should OSHA standards be followed, but experts also urge employers to adhere to consensus standards.



Avoiding hazards and complacency

Protecting workers from electrical hazards can be relatively simple, despite the technicality of the field. Scott said electrical incidents result from three factors: unsafe equipment or installation, an unsafe environment, or unsafe work practices. Prevention can be achieved through the use of insulation, guarding, grounding, electrical protective devices and safe work practices.

According to Hoagland, PPE plays a huge role in reducing deaths from electrical hazards. Electrical fatalities have dropped in recent years, beginning in 1994 when OSHA issued final rules on both electrical power equipment and PPE. Use of insulating gloves and flame-resistant clothing has become more common.

However, Scott warned that appropriate PPE alone may not be the best way to protect employees from electrical hazards. "The reality is PPE is the least effective of all control solutions," he said. "When PPE is used as

a control, the hazard remains and PPE simply provides a barrier."

When employees view PPE as a hindrance to their job – because it is uncomfortable or takes too long to put on for simple jobs, for example – they may choose to work without the protection. And this is when injuries or deaths can occur.

The most effective way to manage hazards, Scott said, is to eliminate them through engineering controls. However, great care needs to be taken to ensure those controls are properly implemented. "Most fatalities I've [investigated], it's been on deenergized equipment," Hoagland said. "They had the wrong thing turned off." As a result, he stressed the need for workers to wear PPE until they are certain equipment is turned off.

That brings up another hazard found when working around electricity: complacency. "Novices aren't the ones who get hurt," Scott said. "Experienced workers sometimes lose respect for electricity. They forget how quickly it can jump out at you, so they take shortcuts."

The problem, Hoagland said, is that because incidents may happen only once in a while, people underestimate the risks and take shortcuts.

"They think, 'I've never had a problem before; it'll only take a minute," Masarick said. "They don't think about the hazard. That's where electricians make the mistake."

NFPA 70E

Scott suggested many of the electrical hazards found in workplaces could be avoided if employers complied with the Quincy, MA-based National Fire Protection Association's consensus standard for electrical safety in the workplace, commonly known as NFPA 70E. "Many times there is a belief that being safe means following the OSHA standard alone, and there is a failure to incorporate compliance with the consensus standards in their safety programs," Scott said.

This "illusion" of an OSHA minimum – that suggests only following OSHA standards is enough to maintain compliance and safety – is an excuse to maintain the status quo, Hoagland said. The real OSHA minimum, he said, is one in which everyone goes home safely every day. Consensus standards help employers achieve that goal. "70E is almost word for word what you will find in the best companies in the United States," Hoagland said. "If you follow 70E, OSHA has in writing you will be in compliance." S+H

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NUMBER OF DEATHS IN 2009* DUE TO:
Contact with overhead power lines63
Contact with wiring, transformers or other electrical components 60
Contact with electric current of machine, tool, appliance or light fixture 33
Contact with electric current, unspecified5
Struck by lightning4
*Data for 2009 is preliminary.
Source: Bureau of Labor Statistics