Joint Safety Committee
Oregon Pacific-Cascade Chapter, NECA
IBEW Local 932
Wednesday January 24, 2024
Meeting Minutes

Roll call: meeting called to order, In-Person and Zoom
Approval of previous Meeting Minutes

1.0 Communications

We were few in number and discussed the new push by OSHA requiring hard hats for their own employees. Also discussed Fall trigger heights.

In addition we discussed a few excertps from the packet.

2.0 OSHA Injury/Incidents (July-December)

Recordable
2.1
2.2
2.3
First Aid/Near-miss
2.4
2.5

3.0 Class Schedule- Posted online

Next Meeting: March 27th, 2024

Adjournment

Vaughn Pugh
Integrity Safety-Consultant

January 24, 2024

Wiring a green tomorrow

NECA IBEW
OREGON PACIFIC - CASCADE LOCAL 280

Joint Safety Committee
Oregon Pacific-Cascade Chapter, NECA
IBEW Local 932
Wednesday March 27, 2024
Meeting AGENDA

Roll call: meeting called to order, In-Person and Zoom
Approval of previous Meeting Minutes

1.0 Communications

1.1 Any OSHA visits this last year?
1.2 Please let me know if you have any needs I can help with

2.0 New Business- (safety packets distributed)

2.1 Recordables, What constitutes it?
2.2 Fallacies of Arc Flash

3.0 OSHA Injury/Incidents (July-December)

Recordable
3.1
3.2
3.3

First Aid/Near-miss
3.4
3.5

4.0 Class Schedule- Posted online

All NECA Contractors are reminded that work related accidents and incidents should be reported via the Accident/ Incident report to the NECA office for consideration by the committee. If you need a copy of the report, contact the Chapter office.

IMPORTANT REMINDER: The variance granted to NECA/IBEW by OR-OSHA requires participation by both Labor and Management Representatives at the Joint Innovative Safety Committee. For the Committee to be viable and provide assistance to Contractors and IBEW Members we need to have consistent attendance of all committee members.

Next Meeting: May 22th, 2024

POWERFUL TRADITION ELECTRIFYING FUTURE

OREGON PACIFIC-CASCADE CHAPTER

Safety Meeting Packet

March 2024

1040 Gateway Loop, Suite A ◆ Springfield, OR 97477

541-736-1443 Office ◆ 541-736-1449 Fax

2024 LABOR HOURS RECAP
ALL SIGNATORY CONTRACTORS

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
280	Inside	74,017	1	74,017	74,017											
280	Inside Appr.	18,960	1	18,960	18,960											
280	MAI	0	0	#DIV/0!	0											
280	Material	5,609	1	5,609	5,609											
280	Residential	6,746	1	6,746	6,746											
280	Resi. Appr.	3,512	1	3,512	3,512											
280	S & C	13,307	1	13,307	13,307											
280	S & C Appr.	3,633	1	3,633	3,633											
280	Support Tech/MOU	5,417	1	5,417	5,417											
	TOTAL 280	**131,201**	1	**131,201**	**131,201**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total NECA	**113,306**	1	**113,306**	**113,306**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	% NECA	**86.36%**	1		**86.36%**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
659	Inside	14,003	1	14,003	14,003											
659	Inside Appr.	5,743	1	5,743	5,743											
659	Material	300	1	300	300											
659	Residential	381	1	381	381											
659	Resi. Appr.	366	1	366	366											
659	S & C	584	1	584	584											
659	S & C Appr.	0	0	#DIV/0!	0											
	Total 659	**21,377**	1	**21,377**	**21,377**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total NECA	**15,350**	1	**15,350**	**15,350**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	% NECA	**72%**	1		**72%**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
932	Inside	10,071	1	10,071	10,071											
932	Inside Appr.	3,824	1	3,824	3,824											
932	Residential	0	0	#DIV/0!	0											
932	Resi. Appr.	378	1	378	378											
932	S & C	455	1	455	455											
932	S & C Appr.	0	0	#DIV/0!	0											
	Total 932	**14,728**	1	**14,728**	**14,728**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total NECA	**11,471**	1	**11,471**	**11,471**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	% NECA	**78%**	1		**78%**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**
	Grand Total	**167,306**	1	**167,306**	**167,306**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total NECA	**140,127**	1	**140,127**	**140,127**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	% NECA	**84%**			**84%**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**

2024 LABOR HOURS RECAP
NECA MEMBERS

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
280	Inside	64,144	1	64,144	64,144											
280	Inside Appr.	15,966	1	15,966	15,966											
280	MAI	0	0	#DIV/0!	0											
280	Material	5,160	1	5,160	5,160											
280	Residential	3,854	1	3,854	3,854											
280	Resi. Appr.	2,462	1	2,462	2,462											
280	S & C	13,048	1	13,048	13,048											
280	S & C Appr.	3,625	1	3,625	3,625											
280	Support Tech/MOU	5,047	1	5,047	5,047											
	Total 280	**113,306**	1	**113,306**	**113,306**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Local#	Contract Type	Annual Total		Average Hrs/Mo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
659	Inside	10,417	1	10,417	10,417											
659	Inside Appr.	3,956	1	3,956	3,956											
659	Material	112	1	112	112											
659	Residential	181	1	181	181											
659	Resi. Appr.	100	1	100	100											
659	S & C	584	1	584	584											
659	S & C Appr.	0	0	#DIV/0!	0											
	Total 659	**15,350**	1	**15,350**	**15,350**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Local#	Contract Type	Annual Total	0	Average Hrs/Mo	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
932	Inside	7,733	1	7,733	7,733											
932	Inside Appr.	3,173	1	3,173	3,173											
932	Residential	0	0	#DIV/0!	0											
932	Resi. Appr.	110	1	110	110											
932	S & C	455	1	455	455											
932	S & C Appr.	0	0	#DIV/0!	0											
	Total 932	**11,471**	1	**11,471**	**11,471**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Grand Total	**140,127**	1	**140,127**	**140,127**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Safety Training Topics

April 2024

Identifying Electrical Hazards in the Home

Understanding Arc Flash as a Hazard

Understanding Electrical Injuries

Accident Review: Electrocution

SAFETY TRAINING TOPIC

Identifying Electrical Hazards in the Home

Electrical hazards exist in the home and office in addition to a variety of different job sites. In fact, many electrical injuries and electrocutions occur away from work. Fortunately, there are some tips that you can follow, to help protect yourself from electric shock, electrocution and fires in the home or office setting.

Inspect electrical outlets for loose fitting plugs, as they can increase the likelihood of shock and electrical fires. If you observe missing or broken wall plates, replace them immediately and avoid overloading outlets with too many appliances. In the event that small children will be around unused outlets, you should make sure to use tamper resistant safety covers.

It is important to check cords of appliances as well as the plugs and connectors, to make sure they are not frayed, cracked or damaged, placed under rugs or carpets, resting on furniture or located in high traffic areas. Never nail or staple cords to walls, floors or any other objects.

If you need to use an extension cord for any purpose, it should only be done so on a temporary basis. If you are using extension cords, make sure that they have safety closures to protect young children from shocks or mouth burns. Never use an indoor extension cord for outdoors. Never use multiple extension cords.

You should check all electrical panels to make sure that all breakers and fuses are properly rated for the circuit that they are protecting. If you are not sure what the correct rating is, have a qualified electrician identify and label the correct size that needs to be used. When an appliance keeps blowing a fuse, trips a breaker or shocks you, immediately unplug, repair or replace it. When replacing a fuse, you must replace it with the same size as the fuse you're removing.

Additionally, inspect all light bulbs and appliances to ensure the wattage matches each fixture requirements. Never replace bulbs with those that have higher wattage than recommended. When changing a light bulb, make sure that it is screwed in properly to prevent overheating.

Check for ground fault circuit interrupters (GFCIs) on electrical outlets. A GFCI is an inexpensive electrical device that shuts off power instantly if there is problem. If you do not have them, you should install them, especially in all "wet" areas of the home such as bathrooms, kitchens and basements. Test them monthly to ensure they are operating properly.

You may also consider adding arc-fault circuit interrupters (AFCIs) on bedroom circuits, carbon monoxide and smoke detectors. If you have additional questions or concerns consult with an electrician or local electrical inspector.

REVIEW AND DISCUSSION

- What can happen if you use an electrical appliance with a loose fitting plug?
- When it is acceptable to nail or staple appliance cords to walls or the floor?

SAFETY TRAINING TOPIC

Understanding Arc Flash as a Hazard

Arc flash occurs when a flashover of electric current leaves its intended path and travels through the air from one conductor to another, or to the ground. The results can be detrimental if you or a colleague is in close proximity to the arc flash. This hazard can cause serious injury or even be fatal. It is important to understand what causes arc flash and how to avoid it.

Arc flash can be caused by many things including dust, dropping tools, accidental touching, condensation, material failure, corrosion, and faulty installation. Three factors determine the severity of an arc flash injury:

- Proximity to the hazard
- Temperature
- Time for circuit to break

If you experience an arc flash injury, your quality of life may never be the same. It is important to understand how to avoid the hazard. An arc can result in burns, fires, flying objects, blast pressure, and a sound blast.

The National Fire Protection Association (NFPA) has developed shock and arc flash boundaries designed to protect you when working on or near energized equipment. These are:

- Limited Approach – distance from an exposed energized electrical conductor or circuit part within which a shock hazard exists. No unqualified workers are allowed inside this boundary.
- Restricted Approach - distance within which there is an increased risk of shock, due to electrical arc over combined with any inadvertent movement while working close to an energized electrical conductor or circuit part.
- Prohibited Approach (inner boundary) - a distance from an exposed part which is considered the same as making contact with the live part. This distance is not common between equipment. Some equipment will have a greater flash protection boundary while other equipment will have a lesser boundary.
- Arc Flash Boundary- distance within which an arc flash hazard exists and the incident energy level could cause severe damage and appropriate PPE is needed. At 1.2 cal/cm2 second degree burns occur.

When determining what the appropriate boundary should be for a given hazard, you will need to assess the severity of the hazard. There are a variety of factors that will impact what the safe approach boundary will be. They include level of voltage, atmosphere and other activities being conducted in proximity to the hazard.

REVIEW AND DISCUSSION

- What are some things that can cause an arc flash from occurring?

SAFETY TRAINING TOPIC

Understanding Electrical Injuries

When working on or near electricity, a variety of electrical hazards are encountered on a daily basis. At some point you may encounter a colleague that becomes a victim of electric shock or an electrical burn. If this occurs, there are some reactionary measures that you should be familiar with to help respond to the situation.

First, it is imperative to understand that electrical injuries are very different than other types of injuries. Electric shock occurs when electricity flows through the body. When electricity flows through your body it has in impact on the normal electric impulses that occur in your nerves. It can damage your internal organs, heart rhythm, and even cause death.

Once electricity enters your body it generates heat, which can cause burns to internal organs. Electric arcs can also occur at the point of entry/exit, generating dangerous levels of heat that can result in severe burns to the skin.

If you observe a victim of an electrical injury, do not touch them while they are still in contact with the source of electricity. If you do, the electricity could enter your body and you both will become victims. If the source of the electricity can be shut off, do so immediately. If it cannot and there is suitable equipment on hand to protect against appropriate voltage, you can use it to free the victim.

Once the person is free from the electrical source, check to see if they are breathing and they have a pulse. If the victim is not breathing or does not have a pulse, you may need to begin cardiopulmonary resuscitation (CPR). Never perform artificial respiration on a victim that is breathing.

Additionally, you should look for the following symptoms for shocking sensations; numbness or tingling, change in vision, speech, or any unusual sensation, burns or open wounds, muscle spasms or contractions, sudden ,immobility or fractures, potentially deformed body parts, interrupted breathing, irregular heartbeats or chest pain, seizures, or unconsciousness.

In the event that any of these symptoms are evident, you should immediately call 911. Even if the contact was a low voltage source or there are no real symptoms of electric shock, you should still have the victim seek medical attention. Certain effects of the electricity are not always immediately apparent.

REVIEW AND DISCUSSION

- What should you never do if you observe a victim of an electrical injury still in contact with a source of electricity?
- When should you never attempt to perform CPR on a victim of an electrical injury?
- What type of symptoms should you look for to contact emergency following an electrical injury?

SAFETY TRAINING TOPIC

Accident Review: Electrocution

A steelworker was electrocuted when he contacted the energized case of a toaster oven. While taking a break from his normal work routine, the victim sat upon a wooden bench and rested his right forearm on a floor model air conditioner upon which the 120-volt toaster oven was setting. The victim's right arm contacted the energized casing of the toaster oven while his right calf contacted the grounded air-conditioning unit.

The victim received an electrical shock and went into cardiac arrest. The victim was treated by the local emergency medical service and transported to the local hospital where he was pronounced dead on arrival.

The company had a written safety policy and a comprehensive safety program. On-the-job and classroom training was provided to all employees, as well as training videos and safety manuals on electrical hazards. Additionally, weekly safety contacts were made and documented.

Following the incident investigators concluded that, in order to prevent future occurrences, employers should:

- Employers should periodically inspect all areas of their facilities, especially non-production areas, lunch rooms, break rooms, rest rooms, etc., to identify non-polarized plugs, improper grounding, and any other electrical hazards that may be present, and then apply appropriate measures to eliminate the hazard.

- Employers should require that all appliances brought into their facility be tested for electrical integrity by a qualified person before they are used. Employers should not only require such testing, but also ensure that all supervisors and workers are aware of the testing policy. [Note: The employer in this incident has adopted such a policy.]

- Employers should periodically re-evaluate safety programs and reinforce training related to worker recognition, avoidance, and reporting of hazards. A subsequent interview of the witnesses revealed that the victim and his co-workers were aware that a problem existed with the oven. On a number of occasions the workers, including the victim, had received electrical shocks from the oven.

- Employers should provide CPR training to all workers, both management and labor. Employers should ensure that all workers are provided with CPR training to support circulation and ventilation until trained medical personnel arrive.

REVIEW AND DISCUSSION

- What types of hazardous conditions might you look for to prevent a similar incident?

Safety | NewsAlert

10 ways to create a better safety culture

SAFETY CULTURE

Contents

370 Technology Drive
Malvern, PA 19355
610-727-0515

10 ways to create a better safety culture

You can get a pretty good argument going among safety professionals as to what's better: Slapping a guard on every piece of machinery or concentrating on behavior-based safety to get people to instinctively make the right – and safe – choices?

Both theories have their adherents, and many of these followers feel passionately about the correctness of their beliefs.

Over the past couple of decades, the prevailing philosophies on safety management and culture have shifted back and forth like a pendulum. To examine how we got there – and where we are today – a brief look at the recent history of the prevailing streams of thought about safety management may be useful and illustrative.

The Occupational Safety and Health Administration (OSHA) was created in 1971.

The newly created agency was given broad powers to enforce worker safety and health at America's 7 million companies and workplaces. OSHA certainly wasn't the first government safety agency.

The Mine Safety and Health Administration (MSHA) is much older than OSHA itself and regulates safety in underground mines. It was created in response to a public outcry over several cases of multiple fatalities in mines, and MSHA operates in a substantially different way from OSHA.

By mandate, MSHA must inspect all mines periodically. OSHA does not have the resources to inspect millions of companies every decade, let alone every year, so OSHA must rely on other means to ensure worker safety.

What OSHA wants

OSHA uses two main strategies in an attempt to reach its stated mission of making all workplaces safe.

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610-727-0515

First, it encourages all U.S. workers to report any safety hazards they see in their employers' environments, first to the employers' representatives and if the complaints are ignored, to OSHA itself. OSHA effectively "deputizes" all workers as safety inspectors and encourages them to come forward.

OSHA also protects "whistleblowers" against companies that retaliate against them for lodging safety complaints. Many OSHA inspections are carried out in response to worker complaints.

OSHA first attempts to resolve the dispute with company management through telephone or e-mail. But if the questions raised are serious enough and no satisfactory response is forthcoming from company managers, an inspector will soon knock at the door.

The second way OSHA set about to achieve its goals, even if it couldn't be present in all workplaces like MSHA, was by issuing a set of rules or "standards" for minimum compliance. These rules served as mandatory guidance to companies on how to keep workers safe from most potentially dangerous situations found in workplaces.

Companies ignored these rules and standards at their peril. Non-compliance and discovery of such non-compliance through an OSHA inspection would bring fines – OSHA sometimes got the fines up to millions of dollars – and orders to abate under threat of further inspections, repeat fines and ultimately in extreme cases even court-ordered shutdowns.

Specific standards or general principles?

The 1970s, and to a lesser extent the 1980s, saw a flood of very specific regulations sometimes occupying pages and pages of the Federal Register, the place where all regulatory agencies' standards were published.

Most rules were mandatory, but some were voluntary. Even voluntary standards were not easily ignored. If someone got hurt at a company that had not followed the voluntary guidelines, it was often argued that the company should have known the practice leading to the injury was dangerous.

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Therefore, a company could be found guilty under the “general duty clause" that establishes every employer's duty to keep workplaces free of recognized safety hazards. Most of the initial surge of standards had one thing in common: They were incredibly specific.

The early focus in the safety philosophy was on installing safety guards on every piece of machinery, and specifying how many inches they should be away from moving points, etc.

Some standards, like the asbestos protection rule, were so specific they had to be accompanied by pages and pages of charts and pictures telling employers (or their designated safety managers) what kind of asbestos fibers to test for.

Noise protection standards had floor levels of 85 decibels for when audiometric testing should begin.

The fall protection standard said protection must be provided at four feet in general industry, five feet in maritime and six feet in construction. However, regardless of the fall distance, fall protection must be provided when working over dangerous equipment and machinery.

Permissible chemical exposure levels were set at very exact limits, so many micrograms per an 8-hour average weighted period, etc. Everything was incredibly specific.

The culture created by the OSHA regulatory philosophy was based on rules and sustained by fear: “Thou shalt ...” or else.

How the rest of the world thinks about safety

Meanwhile, safety legislation in other parts of the world took a different tack. In Europe, after much of the responsibility for safety legislation was shifted from individual nation states to the new European Community headquartered in Brussels, Belgium, regulators took a more general approach.

They preferred to defer the responsibility to the employer to make a serious effort to determine what the main hazards in the workplace were and to minimize risk in the best possible way. The advantage of the European model was that it made employers think more for themselves, rather than blindly relying on minimum OSHA standards.

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One disadvantage was that it always became very easy to second-guess employers and to make the accusation after any incident that not enough had been done to protect workers.

In the European model, the safety culture put more emphasis on employers having to figure it out for themselves, often in consultative processes with worker councils.

In the 1990s, a new philosophy of safety management cropped up. Led by safety specialists like Scott Geller of Safety Performance Solutions, a psychology professor at Virginia Tech in Blacksburg, VA, and Tom Krause, the founder of the Behavioral Science Technology consulting firm based in Ojai, CA, a new school of thought stressed worker behavior as a principal factor in workplace safety cultures.

These leaders and other prominent consultants urged safety managers to pay more attention to the people side of safety instead of going around the workplace with a ruler to make sure that all of OSHA's specific engineering requirements were followed to the millimeter.

Where the OSHA rule-based safety culture fell short

The new philosophy was in part born out of a disappointment with the results on rulemaking. Yes, injury and fatality rates had come down since OSHA's formation, but perhaps they had been trending down anyway because of safer machinery and other factors.

And OSHA rules largely ignored human behavior, which are obviously a huge factor in safety performance. Perhaps, in defense of OSHA, it was much more difficult – if not impossible – to legislate human behavior. Certainly, it would have been difficult to form a consensus around it in the cumbersome rule-making process, during which comments from all stakeholders must be considered.

Add to that the fact OSHA rules were only minimum standards. Safety leaders recognized that to eliminate most work-related injuries and illnesses companies would be well advised to go beyond OSHA's minimum compliance standards.

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1. Going beyond minimum OSHA standards

For all of the above reasons, the first strategy to achieve an effective safety culture is to go beyond minimum standards.

Another factor making this strategy necessary was the fact that workplaces tended to change more rapidly than OSHA could keep up with by making new rules. Machines that OSHA regulated might have become – and indeed did become in many cases – obsolete before the agency could change the rules.

OSHA's process for changing rules or making new ones was extremely cumbersome, so the agency could do little to keep up with rapid technology changes or new scientific research and discoveries pointing to the need for more stringent protections and lower exposure limits.

Voluntary standards like those adopted by the American National Standards Institute (ANSI) were often a useful complement to mandatory OSHA rules. In any event, to really drive down injury rates, most companies discovered they had to go considerably beyond the minimum OSHA standards. OSHA standards had become largely irrelevant in the eyes of many.

The rise of behavior-based safety

The 1990s saw the theory of behavior-based safety really come into vogue. Some of the leading safety consultants who were the prophets of behavior-based safety (some later started calling it people-based safety as well) got marked results in large industrial settings. They reduced total recordable injury rates to one-tenth of what they were in some cases – and kept them down. As most safety professionals know, this one of the hardest things to do.

The new prophets of behavior-based safety contended the most important thing in any safety culture was to change worker behavior so employees would instinctively opt for making the safe decisions in the course of their work, whatever the nature of that work. Behavior-based safety leaders talked very little about specific machine guards, engineering controls or personal protective equipment (PPE) to prevent injuries. They said it all depended on the training and education workers

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received and ultimately the nature of the workplace culture in which they labored.

Some of the passionate believers in behavior-based safety even went so far as to suggest that physical safety tools like PPE, engineering controls, machine guards and others did not matter – if people naturally behaved safely, they would avoid injuries no matter what physical safety tools were in place.

The pendulum swings back

The pendulum has swung back a bit. Some decades after the first voices were raised in favor of behavior-based safety, most enlightened safety leaders today use a hybrid system in search of the right safety culture.

They have incorporated the best elements of both. They do not want to neglect either side. They pay equal attention to physical barriers between potentially dangerous machinery and the human body, as well as to the minds of the people in their workforce to ensure they have safe working habits and a safe approach to their specific job functions.

Today, most progressive workplaces practice some form of behavior-based safety along with the best possible physical tools to keep employees safe and healthy.

2. Using risk management techniques to improve the safety culture

Another trend that has manifested itself of late is the rise of risk management. The practice of risk management is often combined with safety management, because obviously, work incidents in which employees get hurt represent one of the major risks a company may face.

But risk management is more than just keeping workers safe, as important as that is. It also includes the prevention of damage to valuable equipment, which again is intimately related to people's safe work habits, as well as loss prevention through theft and sabotage, and managing the right amount of insurance coverage.

The cost of insurance coverage depends heavily on a company's safety

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record. The workers' compensation insurance laws in effect in all states force companies to pay hefty premiums based on an experience rating with safety incidents. As a result, employees must spend some number of days away from work because of workplace-related injuries or illnesses.

Safety management seen as risk management

Thinking in terms of risk helps safety professionals communicate with upper-level management about the needs of a good safety program because risk management forces safety practitioners to express the pros and cons of what they propose in terms of dollars and cents. That's often the only language hard-nosed businesspeople at the top understand.

An effective safety program is all about managing and mitigating risks. Not having a machine guard on a piece of equipment that could easily amputate a worker's limb is obviously an unjustifiable risk. It also would be a blatant violation of OSHA rules, which carries hefty fines.

Not having a program in place to make sure construction workers wear hardhats when they are in danger of being struck by falling or moving objects falls into the same category. It's an unacceptable risk as well as a violation of government rules.

3. Focusing on people as the greatest risk

Failure to instill safe working habits and a natural tendency toward safe behavior in the workforce is an important and unacceptable risk, too.

It is at least as important as any failure to observe specific OSHA rules. After all, the greatest risk factor in any complicated workplace with some level of hazards is the human factor. People are by nature unpredictable; you never know what they're going to do from one moment to the next, in spite of the best training you can provide.

A lot depends on the mood of the worker at the time. Distracted or fatigued workers are prone to errors, some of which can have disastrous safety consequences when multiple lives and expensive equipment are at stake.

Even though some safety professionals may be reluctant to admit it, their challenge is to force people to make the right decisions in hazardous

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situations by removing variables from the situation and thus eliminating any possibility that a person might make the wrong split-second decision.

A guard is mounted on a machine to force people to keep their hands away from moving and dangerous parts – to force them to do the right thing and prevent them from doing the wrong thing. This way the right decision-making process eventually emerges naturally and becomes part of the culture of the organization.

But by the same token, safety professionals would be well advised to train the hearts and minds of their workers to such a degree that by their very nature they are required by the all-pervasive surrounding culture into behaviors that lead them to make the right and safe decisions in every situation because to do anything else has become an unnatural act and doesn't fit the culture.

The balanced approach to safety management

Most safety leaders today also use a layered approach to safety training to mitigate the risk of anything bad happening to either the company or its workers. Of course, long-term goals are the same for both – keep workers healthy and safe.

Most companies these days are running their operations with better equipment that fails less and is safer for the people working on it. That is one reason workplace injuries are down overall, albeit with notable exceptions. But leading safety professionals recognize that just having better, more modern and safer equipment is not enough.

To attain an effective safety culture, there must be a balance between physical safety measures and behavior-based safety, all the time trying to nudge people into the right direction of doing things safely and removing the choice for doing it any other way. It's all about balance.

4. Using error flow logic to find faults in safety management culture

To attain a safety culture committed to finding and eliminating risks, it is useful to borrow a tool from the quality management arena.

Quality assurance and control managers are not primarily concerned

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with keeping workers safe. They worry about defects in products, and they long ago discovered it's better to engineer quality in on the front end than to fix defects on the back end.

Similarly, safety managers generally prefer to get people to work safely instinctively out of cultural safety considerations, rather than discover the need for retraining after an incident.

To prevent errors, quality managers work with an "error flow logic" to find any deviance from the normal and ideal production process. Similarly, safety managers can use an error flow logic process to find the deviance in a safety culture and fix it. Once again, to maintain the needed balance, such deviances can be found in both a company's physical equipment as well as in human behavior or training.

From a cultural perspective, when deviant events are tolerated, the potential for error grows. If events such as near-hits are overlooked, misinterpreted or simply allowed without question, this is a recipe for disaster. The next time it might not be a near-miss (or near-hit). It might be a full-scale hit with unfortunate (though preventable) consequences.

5. Setting clear expectations for workers

Safety professionals need to get workers systematically thinking they have two main obligations in their daily jobs.

The first is: "I'm not going to do anything wrong." This is largely a matter of sufficient training. Have they been shown the correct way to do things and have trainers checked that people understood the training and are putting it into practice?

The second is: "If I can't fix it so it will run as it's supposed to, I'm going to call in someone who can help me do that." This is often a matter of safety culture. Do elements of a culture still survive in which it is considered "weak" behavior to ask someone else to help pick up a heavy load? Do people fear being blamed somehow if a piece of equipment isn't performing properly and safely?

If so, a deviance from the desired safety culture has been allowed to exist. People have not been coaxed or "forced" into making the right decisions. The possibility for making the wrong decision is still wide open.

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And it is inevitable that sooner or later someone will get hurt by trying to do too much alone, whether it is fixing a machine jam or carrying too heavy a load. Of course, the latter will no doubt result in one of those back injuries that affect the worker for a lifetime and is very expensive to treat.

Most safety leaders still struggle to identify core causes of incidents. It's too easy to blame human error and operator mistakes for things that go wrong.

To be sure, human error is probably a factor in many mishaps. But it probably isn't the only factor. There are likely other contributing circumstances that make it too easy for the operator to make the wrong decision.

Another way of saying the same thing is that the cultural forces are not strong enough to ensure the worker will make the right decision.

Traditionally, in incident investigations, the focus has been on corrective action directed toward worker behavior. Someone made a mistake and ought to be disciplined for the mistake to make sure he or she never does that again – and so other workers in the organization get the same message that they, too, will be harshly dealt with if they make similar mistakes.

There is a natural tendency to rush to judgment and conclude a worker made a mistake, and that's why the incident happened – to the exclusion of the consideration of all other possible contributing factors.

The trouble with discipline as an exclusive remedy

Disciplining a worker seems to bring a reliable closure to every incident and allows the organization to get on with business. But the problem with blaming it all on human error is that workers rarely – if ever – knowingly want to lose a thumb in a machine.

To be sure, there are extremely rare cases in which workers have wrapped a bloody hand in a handkerchief and asked for permission to go home because they were suffering from a "cold" just so there would be no reportable incident, and the whole work crew could get a big bonus for no OSHA recordables.

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At a convention of union safety people a while ago, a contest was held among attendees as to what the biggest body part was that had ever been smuggled out of a worksite to avoid having to record an injury.

The grisly contest was won by a safety pro who once discovered a whole finger had been smuggled out of the plant once. But apart from those extremely rare exceptions, people don't want to injure themselves. And when they do, they don't want to cover it up after the fact, either.

If they do lose a thumb, that says almost nothing of their value as productive workers. All it shows is perhaps they weren't so good at managing their own safety risks. It is perhaps more helpful for safety managers investigating incidents to view them not as unsafe acts, but as at-risk behavior that shows corrections are necessary in the company culture.

6. Conducting root cause analysis – the Quality way

There is another principle from the science of Quality management that can be helpful for determining the root causes of safety incidents. Quality management experts often speak of "latent errors."

These are management system errors that are not immediately evident (which is why they are latent, like the part of the iceberg that is below the waterline and not visible). But they will eventually and inevitably lead to operator errors unless these latent errors are identified and corrected.

Negative consequences of latent errors often lie dormant in systems for long periods of time before something happens. But something will happen and probably at the worst possible time, according to Murphy's Law, which most safety managers are all too familiar with.

Good quality managers look at all opportunities for finding errors in the system – they develop a nose to sniff out such opportunities. They know unintended events or adverse conditions will eventually cause consequences if the latent error is not corrected – and that's exactly what good safety leaders do. They ask themselves all the time: "What can go wrong here?" And then they remove the possibility of such a "wrong event" – in effect forcing the operator to always make the

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correct decision by removing the variables that can lead to wrong and unsafe decisions.

7. The importance of training in safety cultures

Safety training – or more precisely the lack of good safety training – can be such a latent error that lies dormant for a long time before the consequences are seen.

For example, if one plant engaged in a particular task dedicates 60 hours per year to safety training for its work force and another plant dedicates only eight hours per year to safety training even though the tasks are similar in both plants, that could be considered too much deviance from an ideal safety management culture.

Eventually the plant that is dedicating only eight hours of workers' time to safety training will have an incident because there has not been enough training.

Perhaps just as important, management has not sent the message to the workers that it considers safety training important. If management doesn't seem to think it's important, workers won't either.

If there would be an incident in the plant with insufficient safety training, probably some type of human error would be involved. But a correct analysis would show the root cause wasn't really worker error; it was the management culture gap of not providing adequate training.

Again, in this case a manager at the plant with the insufficient training would not have lived up to his or her responsibility to force employees into making the correct decision. He or she didn't do enough to create a safety culture in which the variables have been removed that could lead – and did lead – to making wrong and unsafe decisions.

Was the fatality the worker's own fault?

At one Kimberly-Clark paper mill, the safety leader was once called away from his Thanksgiving dinner to investigate a fatality.

His investigation showed the deceased worker had stuck his head in a place where he shouldn't have stuck anything at all, least of all his head. It would have been easy to just blame worker error, close the

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investigation and get on with business.

But the safety leader refused to ignore other contributing causes: When he arrived at the plant, the security guard told him he had always known five people in the plant were likely to get killed on the job.

Now there were only four left, the guard said. If even the security guard at the door knew risky behavior was tolerated on behalf of these employees and he knew who they were, shouldn't the safety officer and the rest of the management team have known the same?

Couldn't they have done something about correcting the culture, either through retraining, behavior modification – or, if nothing else worked, removing the risky-behavior people from the line of danger?

As is often the case in these types of investigations, there were other contributing factors.

It was also known that the safety guard, which would have prevented the worker from sticking his head into the machine and getting it crushed, had a history of failure and wasn't engineered properly.

Failure to put enough emphasis on having the right safety guard that wouldn't constantly malfunction was certainly a gap – and a deviance – in the management of the safety culture.

In the end the safety leader concluded that by a series of failures in the management culture, "we drove that worker to make a bad decision that cost him his life."

It may not be possible to remove 100% of the risk from a particular class of machinery in an industrial plant. If you can't take the risk out of the machinery, then you have to rely on human behaviors, which can only be reliable with the right kind of culture and leadership in the operation.

That's where the rubber meets the road again in trying to achieve a balance between physical safety equipment and behavior-based safety.

8. Three basic questions for safety audits

To ensure the right kind of leadership is provided in the furtherance of the right safety culture, internal safety audits should be held frequently. Every site manager should focus audits on three areas/questions:

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1. **The physical work environment:** Has it been made as safe as possible?
2. **Worker behavior:** Are unsafe acts tolerated?
3. **Leadership:** Does leadership show the right commitment to safety?

Again, it's the balance between physical environments, behavior and leadership that makes any safety culture effective.

9. A matrix for identifying latent safety failures

Safety leaders would do well in their root cause analysis of incidents to consider both "active failures," such as substandard and unsafe acts by employees, as well as "latent failures."

The latent failures are usually more difficult to identify, but they may be much more important. Unless they are corrected, they can lead to repeated incidents.

Once again, such latent failures can be found in physical installations as well as in management systems, calling for a hybrid approach to safety, looking at equipment as well as at behaviors.

Latent failures can be lurking in inadequate conditions and inadequate work practices as well as in inadequate capabilities and inadequate leadership.

Here is a matrix safety professionals can use to look for latent failures in four different areas of the safety culture, paying equal attention to all: Environment; People; Behavior; and Leadership.

Environment

A few important questions to ask regarding the environment are:

1. **Do the workers have the right tools to be able to do the job safely and without long-term harmful health effects?**
2. **Do they have the right personal protective equipment (PPE) and are they trained to use and maintain it properly?**
3. **Do the tools for the job have built-in safety features and are they checked regularly to ensure they still work as designed?**

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4. **Are the workstations and the work flow adequately designed to minimize stressors on the human body?**

   Since ergonomic soft-tissue injuries account for a huge portion of injuries causing days away from work across a wide variety of industries, this is a major risk to be considered. Inadequate design of work stations can be an important latent failure in any management safety system.

5. **What are the purchasing procedures in place for acquiring both work tools and safety equipment?**

   If the company policy is to always buy the cheapest available, that's a deviance from a good safety management culture that will eventually lead to incidents, injuries and illnesses, or worse. It also sends the message to workers that safety is not important.

Lastly, if it isn't important to management, how can the people possibly get the idea that safety is important?

People

Under the people heading, safety professionals would be well advised to look for latent system failures in knowledge gaps on the part of the work force.

1. **Are people properly trained to do the job?**

   What about the process in place to provide safety training? Is it routine – just fill in the blanks here that you've taken this training so we can show a piece of paper in case there's ever an inspection or an incident? Or does the company's management show it really cares the operators have been trained to do their jobs safely?

2. **How much stress is involved for the people doing the job?**

   Stress is a rising risk factor in many U.S. workplace cultures today. There is stress from the economy, stress from increased production demands, stress from having to do more with less, stress from pressures for diversity, and from any number of additional causes. Too much stress will inevitably lead to safety incidents as well.

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3. **What is the motivation of the workforce?**

   Are they highly motivated to do a good job or is the real truth of the matter that they don't care, and they're just there to pick up a paycheck?

4. **What is the hiring system in place?**

   Do hiring managers and the HR department actively look for the best people motivated to do a good job? If the people making it in the door exhibit a "don't care" attitude, all too often there may be a latent failure in the hiring process that can only hurt safety in the long run.

Behavior

You can surround any type of dangerous machinery with guards engineers dream up. But if the people are not instinctively motivated to engage in safe behavior out of the surrounding culture, they will likely at some point attempt to disable the guards or find ways to get around them just to be able to get a job done a little faster with shortcuts.

In the end safety professionals must rely to a great extent on human behavior – that moment when no one is looking over the worker's shoulder – to avoid incidents.

Under the heading of behavior, some essential questions include:

1. **Is there enough safety mentoring going on in an operation?**

   Peer-based observation is one of the best ways to make sure people behave safely even when managers, supervisors and safety professionals aren't there to watch. If the people show they care about each other, praise the correct safe behavior and will not tolerate unsafe behavior in their co-workers – out of genuine concern for them, not out of a desire to "rat them out" to management – then the right safety management systems are in place to create a culture conducive to creating the incident-free workplace.

2. **Are there natural safety leaders among the workers?**

   Have they been allowed to flourish and develop in the system or are they discouraged by management from taking a leadership role in safety? Is there enough safety coaching going on? Are expectations

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for safe behavior clearly spelled out and modeled by peer safety leaders? Is there a tendency to follow safety rules or is cutting corners occasionally tolerated?

A less than resounding "yes" to any of these questions may be an indication of a latent failure in the safety culture that, once again, will lead to incidents.

If there is any tolerance for cutting corners, that's a dangerous deviance from optimal safety management systems, standards and practices.

Leadership

There are a number of important elements to look for in the right kind of leadership necessary for the injury-free workplace safety culture.

1. **Is the cause of working safely getting enough support from the top?**

   Does management communicate with the workers in language they can understand and relate to? Or is the communication from the top worded in bureaucratic memos and legal jargon that workers will not relate to? Communication, and communication style, is extremely important in any culture.

2. **Is there a system for progressive discipline in place and is it consistently followed to ensure the organization as a whole is as strong as its weakest link?**

3. **Is the correct and safe behavior recognized and rewarded?**

   Not in terms of monetary rewards that may become an inducement to covering up incidents and under-reporting, but in terms of making people feel valued and valuable and making them see the significant contribution they make to the company's overall mission when they do their jobs safely?

4. **Are people authentically motivated to do a good job for the overall good of the company and for the cause of safety as well?**

   A safe worker who fails to accomplish enough will not survive; but neither will an extremely productive worker who takes unacceptable

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safety risks to achieve a high rate of production.

Both are ticking time bombs that will eventually cause an operation to underperform, either slowly or suddenly, and dramatically grinding to a halt when an incident causes a major disruption in operations.

5. **Does safety leadership create authentic value, or are the leaders just there to fill out paperwork because somebody has to do it?**

   A safety leader's responsibility has to be much more than filling out OSHA-300 logs and managing workers' compensation insurance claims. Authentic leadership involves being among the workers, setting the right example, reinforcing principles, setting and enforcing high standards, and being available for guidance, coaching and training when and where necessary. By definition, being a leader also means having followers, thus the ability to get people to follow one's lead.

10. Benchmarking: When do you know you're doing well?

How do you know when you're doing a good job and when you've accomplished your mission in safety management, especially in the difficult area of uncovering the "latent failures" that can lurk in both physical equipment and safety management systems to ingrain the right behaviors in the workforce?

The curious thing about leaders in the best safety cultures is they rarely boast of having fantastic safety programs.

Mike Murray, former President & CEO of FirstGroup America, Inc., which owns Greyhound Lines and other transportation companies and employs about 100,000 bus drivers around the country, won a National Safety Council award for his company's outstanding dedication to safety.

So you might think he has some reasons to boast.

However, he says when he discusses safety with other professionals, he's always suspicious of people who say: "We are doing fantastic" and then quote statistics showing how low their injury rates are. To Murray, it sounds like those people are managing numbers, not people.

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Murray replies that his managers seem to be doing pretty well, but they could always do better – and he actively solicits new ideas from others on how to improve upon his own safety programs and culture.

One thing most good safety leaders do is benchmark.

They compare their records to similar companies in their industry, against their own recent experience, with insurance carriers, and with whatever measurements they can find. And they use the data in the quest for continuous improvement.

But just like Mike Murray from the bus company, they're never satisfied. Even if, for example, you're running at a total recordable rate of 0.6 – and that's well below your industry's average – you always try to drive it even lower.

Chances are that to drive it lower – and keep it lower – safety leaders will have to dig harder for those "latent failures." They need to pay equal attention to equipment as well as management systems, while surrounding workers with the right culture that practically "forces" them to make the right decisions – by removing the possibility of any wrong choices being made.

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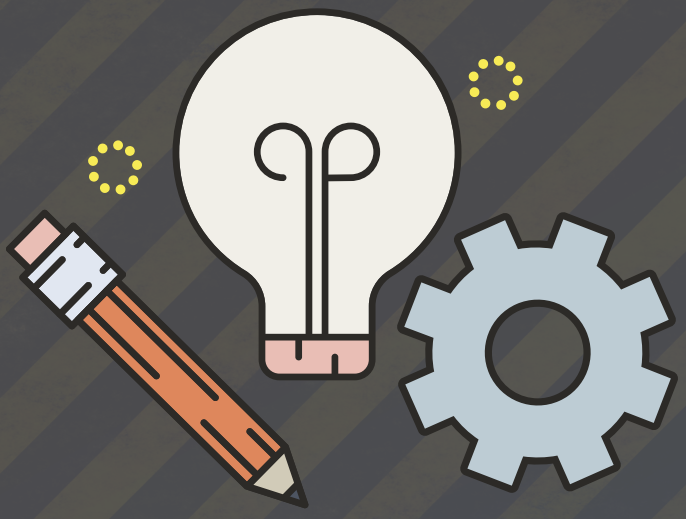
Training Shop

Hotter than the sun:

Beware of arc flash



PRACTICAL TOOLS

Hotter than the sun: Beware of arc flash

Electrical blasts that cause burns, fires and flying shrapnel

Warning Labels

Here's what a typical Arc Flash Warning label contains (which is very important to know):

- **Danger or warning header.** "Danger" is used when the voltage is more than 600. If it's less than that, an orange "Warning" header is used.
- **"Incident Energy at" is the corresponding working distance.** This is the dimension between the possible arc point and the body of the worker.
- **Minimum Arc Rating.** A measurement in calories or joules of

(Continued on Page3)

Avoid burns, serious injuries – and even death – from the electrical hazard known as arc flash.

Powerful and deadly

An energy surge known as arc flash produces blast pressures high enough to knock you off your feet.

Arc temperatures also reach as high as 35,000°F – hotter than the surface of the sun!

Arc flash is a grave safety hazard you'll want to be prepared for.

What is arc flash, exactly?

An arc flash happens when a flashover of electrical current leaves its intended path and travels through the air from one conductor to another.

Arc flashes are caused by dust, dropping tools, accidental touching, corrosion and material failure.

It's not uncommon for people injured by arc flashes to never regain past quality of life.

Arc flashes cause severe burns, fires, flying shrapnel, blast pressures and sound blasts as loud as a gun.

The best way to prevent one is to avoid working on energized electrical equipment altogether.

Use extra caution while testing to make sure equipment has been de-energized.

(Continued from Page 2)

thermal energy at a working distance from an arc fault.

- **Arc Flash Boundary.** This is the shortest distance at which a person may receive permanent injury if not wearing PPE.
- **PPE.** Each risk category requires a different level of protection.
- **Limited Approach and Restricted Approach.** The distance at which qualified and unqualified workers may stand.
- **Shock Risk When Cover is Removed.** This is the voltage of the equipment.

Working 'hot'

If you must work on energized equipment – also known as working "hot" – you must use safety-related work practices.

Safety-related work practices include energized electrical work permits, PPE, insulated tools and/or job briefings.

Arc flash protection boundaries

NFPA's protection boundaries help keep you safe near energized equipment.

They are:

- **Arc flash boundary.** Keep unprotected workers clear.
- **Limited approach.** Stay outside this boundary unless you're wearing proper PPE and are escorted by a specially trained person.
- **Restricted approach.** Only the specially trained workers are allowed past this boundary.

Make sure you've got proper PPE

An arc flash study will categorize the equipment based on incident energy.

The results of the study also identify the Arc Flash Protection Boundary – which is the closest approach allowed before you must wear PPE.

When inside the arc flash boundary, you must wear the proper PPE.

At the highest hazard risk category (4), you must wear cotton underwear plus a flame-resistant (FR) shirt, FR pants and a multi-layer flash shirt.

And remember gloves and footwear.

NAME

SIGNATURE

DATE

Training Shop Quiz

1	The NFPA defines three Arc Flash protection boundaries that electrical workers must observe.	☐ TRUE	☐ FALSE
2	Arc flashes cause serious injuries, but victims can usually bounce back from them quickly.	☐ TRUE	☐ FALSE
3	Stay outside the restricted approach Arc Flash boundary unless you're wearing the proper PPE and you're escorted by a specially trained worker.	☐ TRUE	☐ FALSE
4	An arc flash happens when a flashover of electrical current leaves its intended path and travels through the air from one conductor to another.	☐ TRUE	☐ FALSE
5	A "Warning" header is used on an arc flash Warning label when the voltage is more than 600.	☐ TRUE	☐ FALSE
6	We know a lot about the results of the arc flash, but no one's really quite sure what causes them.	☐ TRUE	☐ FALSE
7	If you must work on energized electrical equipment – also called "working hot" – you must use safety-related work practices.	☐ TRUE	☐ FALSE
8	Oh, man! Arc flashes cause severe burns, fires, flying shrapnel and sound blasts that are as loud as a gun.	☐ TRUE	☐ FALSE
9	The best way to prevent an arc flash is to avoid working on energized electrical equipment altogether.	☐ TRUE	☐ FALSE
10	Watch out: Arc temperatures reach as high as 35,000°F. That's hotter than the surface of the sun!	☐ TRUE	☐ FALSE

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Quiz Answers

1 **True.** They are the Arc Flash, limited approach and restricted approach boundaries.

2 **False.** Victims of arc flashes typically suffer chronic pain and scarring. Usually, the victims never regain their past quality of life.

3 **False.** Only specially trained workers are allowed in the restricted approach boundary. The rules in the question refer, instead, to the limited approach boundary.

4 **True.** An arc flash is a type of electrical explosion that results from a low-impedience connection through air to ground or another voltage phase.

5 **False.** A "Danger" label is used when the voltage is more than 600. If it's less than that, then an orange "Warning" header is used.

6 **False.** Arc flashes are caused by a variety of things, such as dust, dropped tools and material failure.

7 **True.** One major requirement is performing a risk assessment before any work is started.

8 **True.** A high-amperage arc can produce a pressure wave blast with a force of up to 1,000 pounds.

9 **True.** Use extra caution while testing to ensure equipment has been de-energized.

10 **True.** This kind of extreme temperature sets fire to clothing and severely burns human skin.

You Be The Judge

Burns caused by lack of PPE or misconduct?

Here's a challenging court case: This company was cited after an electrician was burned by an arc flash when a ground wire fell against a live wire while he was working in a partially energized electrical panel. He wasn't wearing full PPE at the time of the incident. Was the company held liable for its PPE policy, or was it unpreventable employee misconduct on the part of the electrician?

Company lawyer John Jenkins was sweating profusely, but it had nothing to do with the temperature in his office.

"You really need to start doing yoga or something, John," Safety Manager Pete Travers said. "It'd probably help you with your stress."

"OSHA is fining us about an injury to an electrician," John said, ignoring Pete. "Do you know anything about it?"

"Sam Williams is the electrician's name," Pete replied. "He was working on the electrical panel outside the maintenance shop when it happened."

Ground wire was the problem

"He powered down the side of the box he was going to work on, but then disconnected the ground wire," Pete continued.

"What did that do?" John asked.

"Well, as Sam was working, the ground wire shifted into the other side of the box and touched a live wire," Pete replied. "It caused an arc flash and burned Sam pretty bad."

"OSHA is fining us because Sam wasn't wearing his PPE," said John.

"He had PPE on, but he took the hood and gloves off – which is standard procedure – because they're difficult to work in," Pete said. "Besides, the real problem was that he took that ground wire off when he didn't need to."

"Then I can argue it was unpreventable employee misconduct" John said.

Pete's company appealed the citation. Did it succeed?

The Decision

No, Pete's company lost. The court upheld OSHA's citation of the no PPE violation.

Sam wore a full "hot suit," which provides head-to-toe protection against electrical hazards, when he de-energized half of the electrical box he was working on. Once that was completed, he took his hood and gloves off to work inside the powered-down part of the box.

As he worked, he found the ground wire was in his way, so he removed it, which led to the arc flash that injured his face and hands.

OSHA fined the company because it said Sam was not wearing PPE while working in the partially powered box.

Pete's company argued it was "unpreventable employee misconduct" since Sam took the ground wire off, which he was not instructed to do.

Analysis: Make sure employees wear PPE

While it was company policy, and supposedly industry standard, for Sam to take his hood and gloves off once the half of the electrical box he was going to work on was powered down, that policy did not conform to OSHA's regulations.

OSHA's 29 CFR 1910.335(a)(1)(i) states that employees working near electrical hazards are to be provided with "and shall use" electrical PPE.

When OSHA says "shall use" it means the employer is responsible to ensure its employees use the PPE properly.

Cite: *Secretary of Labor v. Jacobs Field Services*, OSHRC No. 17-1402, 1/11/19. Dramatized for effect.

Electrician sustains life-threatening burns from arc flash: $93K OSHA fine

HAZARDS
1 MINUTE ENGAGEMENT

by **Merriell Moyer**
February 29, 2024

SHARE ON

abama electrical contractor is in trouble with federal OSHA after a 22-year-old trician sustained life-threatening arc flash burns.

The electrician had been guiding wires through an electrical cabinet on Sept. 26, 2023 when the ground wires hit live components resulting in an arc flash that caused burns so severe that the employee had to be hospitalized.

OSHA cited the contractor for requiring its employees to feed wires through electrical cabinets that weren't de-energized, exposing them to shock and burn hazards. Other citations involved failure to train employees to recognize hazards and allowing workers to perform hazardous duties without proper PPE.

Fine: $93,566

Company: Smith's Electrical Service & Repair, doing business as Smith's Electrical, Camp Hill, Alabama

Business: Electrical contractor

Reasons for fine:

One willful violation for failing to:

- prevent employees from working in close proximity to energized, unguarded and ungrounded electric power circuits

Three serious violations for failing to:

- train employees to recognize and avoid unsafe conditions
- require employees to wear PPE when exposed to hazardous conditions
- provide employees with protective helmets when working in areas where there was the possibility for head injuries

Merriell Moyer

Merriell researches and writes about occupational health and safety. He was an investigative and breaking news reporter for the Lebanon Daily News - part of the USA Today Network.

Test Your Knowledge

Electrical shocks: Knowing the facts and risks

When electrical currents run through your skin, the resulting shock can be serious.

Have your people test their knowledge of this hazard by answering *True* or *False* to the following questions.

1. Electric shocks can range in severity from minor tingling sensations to death.

2. Live parts of electrical equipment operating at 15 volts or more need to be guarded.

3. Do not make simple electrical repairs unless you have already shut the power down and have the proper PPE and documents outlining how to fix the equipment.

4. Even if you aren't touching anything metallic, you're still at risk of getting an electric shock.

Answers to the quiz:

1. *True.* A shock of 1 milliampere (mA) will be barely perceptible at all, whereas a shock of 17 mA or more is likely to result in death.

2. *False.* Live parts that operate at 50 volts or more need to be guarded. They should be located in areas where workers can't accidentally come into contact with them and be marked with warning signs.

3. *False.* Unauthorized fixing of electrical equipment is like asking to be shocked. Never attempt to fix electrical equipment unless you've been specifically trained, authorized and instructed to do so by your Supervisor.

4. *True.* The human body can conduct electricity when a current enters and exits through two live wires, one wire and the ground or a metallic part touching a live wire and the ground.