Being Aware of Arc Flash Hazards

Anyone who works around energized electrical equipment is at risk of arc flash hazards. It is important to identify, assess, and control these hazards to maintain a safe work environment

What is an Arc Flash?

An electric arc is an electrical explosion that produces a bright flash gas, where temperatures can **exceed 35,000 °F** (19,400 °C), nearly four times the heat of the sun's surface. The energy released in the arc vaporizes the metal conducting the electricity and produces an explosive arc blast with deafening noises, supersonic concussive forces, and super-heated shrapnel.

Arc flash incidents can ignite clothing, cause structural fires, and produce particles of molten metal, resulting in severe or fatal burn injuries. At these high temperatures, most items within 3 feet (0.9 meters), including skin and flammable clothing, will burn, melt, or vaporize. Most arc flash burn injuries are a result of the arc igniting **flammable clothing** and not from the arc itself.

Damaged electrical boxes.

Causes

There are several conditions that contribute to arc flashes. Faulty, damaged, dirty, or improperly maintained electrical equipment increases the risk for an arc flash incident to occur while the magnitude of the electrical energy/voltage increases its severity. Any inadvertent movement within the restricted or arc flash boundaries, especially when conductive tools are used, also increases the likelihood of an arc flash incident.

Prevention Methods

Methods to prevent arc flashed include:

- Using of lockout/tagout procedures, in compliance with 29 CFR 1910.147, and ensuring the deenergization of electrical equipment is the strongest mitigation measure against all electrical hazards as it eliminates and removes the hazard entirely.
- Identifying and using approach boundaries for qualified and unqualified employees (For more information on Approach Boundaries, see: Establishing Boundaries Around Arc Flash Hazards).

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- Maintaining electrical equipment as required by 29 CFR 1910.334, reduces the risk of an arc flash incident from occurring.
- Applying safe work practices to deenergize and test for the absence of voltage and the use of personal protective grounds in compliance with 29 CFR 1910.333. Notably, arc flashes can occur at voltages below 240V.
- Conducting an arc flash risk assessment to assess the potential for an arc flash hazard, determine the available incident energy of the exposed energized electrical conductor or part, and help in determining and selecting appropriate arc-rated PPE.
- Using and maintaining arc-rated PPE, and insulated tools in compliance with 29 CFR 1910.137 and 29 CFR 1910.335.
- Training workers, in compliance with 29 CFR 1910.332, to ensure they are aware of the hazards they are likely to face and the means to mitigate their risks.

Workers Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For additional information see OSHA's Worker Rights page, www.osha.gov/workers.

Contact OSHA

OSHA's mission is to assure America's workers have safe and healthful working conditions free from unlawful retaliation. OSHA carries out its mission by setting and enforcing standards; enforcing anti-retaliation provisions of the OSH Act and other federal whistleblower laws; providing and supporting training, outreach, education, and assistance; and ensuring state OSHA programs are at least as effective as federal OSHA, furthering a national system of worker safety and health protections. For more information, visit www.osha.gov, or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

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