

Council of Industrial Boiler Owners

Technical Focus Group, Energy & Environmental Committee Meetings
Arlington, VA

Arent Fox

OSHA's Revised Standard Regarding Electric Power Generation, Transmission, and Distribution Work

Presented by

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OSHA Jurisdiction

- **OSHA sets and enforces safety and health standards**
 - **Defined as “a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment”**
 - **“Reasonably necessary or appropriate” interpreted to mean that OSHA can only issue standards if it determines that it is “reasonably necessary and appropriate to remedy a significant risk of material health impairment”**

OSHA Jurisdiction

- **OSHA also enforces the OSH Act’s “General Duty Clause”**
 - **Each employer must “furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to its employees.”**
 - **Applies when there are no applicable standards, and is generally preempted whenever a specific standard applies to the hazardous condition at issue**

OSHA v. EPA: Memorandum of Understanding

- **OSHA responsibilities: enforce the OSH Act to “assure so far as possible every working man and woman in the nation safe and healthful working conditions”**
 - **State plans**
- **EPA responsibilities: ensure the protection of public health and the environment**
- **OSHA/EPA coordination:**
 - **May conduct joint inspections**
 - **Inter-agency referrals**

Electric Power Generation, Transmission, and Distribution Standards

- **General industry standards**
 - **29 C.F.R. § 1910.269 – Electric power generation, transmission, and distribution**
 - **29 C.F.R. § 1910.137 – Electrical protective equipment**

- **Construction standards**
 - **29 C.F.R. Part 1926, Subpart V – Electric power transmission and distribution**
 - **29 C.F.R. § 1926.97 – Electrical protective equipment**

Electric Power Generation, Transmission, and Distribution Standards

- **Final rule:**
 - **Updates standards based on latest consensus standards**
 - **Harmonizes requirements of both sets of standards**
 - **Provides additional protections**
 - **Information transfer (host/contract employers and job briefing)**
 - **Fall protection**
 - **Minimum approach distances (MAD)**
 - **Protection from electric arcs**

Electric Power Generation, Transmission, and Distribution Standards

➤ Costs and Benefits

- 118 workplace injuries annually
- 20 fatalities annually
- Monetized benefits: \$179 million annually
- Costs: \$49 million annually

Electric Power Generation, Transmission, and Distribution Standards

➤ Standards apply to:

- Employers that operate or maintain electric power generation, transmission, or distribution lines or equipment and to which only “qualified employees” have access
- Employers with employees who perform construction work on electric power transmission or distribution lines or equipment
 - “Construction work”: includes the erection of new electric transmission and distribution lines and equipment, and the alteration, conversion, and improvement of existing transmission and distribution lines and equipment

Electric Power Generation, Transmission, and Distribution Standards

- **“Qualified employees”**: employees trained and competent in -
 - Skills/techniques necessary to distinguish exposed live parts from other parts of electric equipment
 - Skills/techniques necessary to determine nominal voltage of exposed live parts
 - Minimum approach distances required by the standard
 - Proper use of special precautionary techniques, PPE, insulating/shielding materials, insulated tools
 - Recognition of electrical hazards to which employees may be exposed and techniques to control/avoid them

Electric Power Generation, Transmission, and Distribution Standards

➤ Standard also applies to:

- Other installations at an electric power generating station
- Communication and metering systems used to monitor, measure, and/or control generation, transmission, and distribution systems
- Support systems such as fuel and ash handling systems
- Line-clearance tree trimming performed for the purpose of clearing space around electric power generation, transmission, or distribution lines or equipment

Electric Power Generation, Transmission, and Distribution Standards: Information Transfer

- **Information transfer requirements between host and contract employers (§ 1910.269(a)(3) and § 1926.950(c))**
 - **“Host employer”**: employer who operates, or controls the operating procedures for, an electric power generation, transmission, or distribution installation on which a contract employer is performing work covered by the revised standards
 - **“Contract employer”**: an employer under contract, other than a host employer, who performs work covered by the revised standards

- **Job briefing (§ 1910.269(c) and § 1926.952))**

Electric Power Generation, Transmission, and Distribution Standards: Information Transfer

- **Information that must be provided by host employer to contract employer**
 - **Characteristics of the host employer's installation related to safety**
 - **Known conditions of the work related to safety**
 - **System design information needed for contractor-required assessments related to safety**
 - **Other known system information (design & operation) related to safety and requested by contractor**

Electric Power Generation, Transmission, and Distribution Standards: Information Transfer

- **Characteristics of the system related to safety:**
 - **Nominal voltages of lines and equipment**
 - **Maximum switching transient voltages**
 - **Presence of hazardous induced voltages**
 - **Presence of protective grounds and equipment grounding conductors**
 - **Locations of circuits and equipment, including electric supply lines, communications lines, and fire-protective signaling circuits**

Electric Power Generation, Transmission, and Distribution Standards: Information Transfer

- **Conditions of the system related to safety:**
 - **Condition of any protective grounds and equipment grounding conductors**
 - **Condition of poles**
 - **Environmental conditions relating to safety**
- **Contract employers must ensure that their workers are informed of hazards they find out about during the information transfer**
- **Host/contractor employers must coordinate work rules and procedures**

Electric Power Generation, Transmission, and Distribution Standards: Information Transfer

- **Information needed for contractor-required safety assessments:**
 - **Permit-required confined spaces**
 - **Forced air ventilation**
 - **Appropriate MADs**
 - **Hazards from flames or electric arcs**
 - **Estimated incident energy from an electric arc**
 - **Whether devices are designed to open or close circuits under load conditions**

Electric Power Generation, Transmission, and Distribution Standards: Information Transfer

- **Information needed for contractor-required safety assessments:**
 - **Known sources of electric energy**
 - **Sources of hazardous/potentially hazardous energy**
 - **Whether protective grounds have adequate current carrying capacity**
 - **Potential for hazardous transfer of potential should a fault occur**
 - **Whether overhead structures capable of sustaining stresses created by work**

Electric Power Generation, Transmission, and Distribution Standards: Information Transfer

- **Information that must be provided by contractor employer to host employer**
 - **Any unique hazardous conditions presented by the contract employer's work**
 - **Any unanticipated hazardous conditions not mentioned by the host but found by the contractor as part of on-going work activity**

Electric Power Generation, Transmission, and Distribution Standards: Job Briefing

- **Employer must provide the employee in charge of the work with certain information before work begins**
 - **Existing characteristics and conditions (described above)**
- **Employee in charge must conduct job briefing with employees involved before work starts**
 - **Hazards of the work**
 - **Work procedures**
 - **Special precautions**
 - **Energy-source controls**
 - **PPE**

Electric Power Generation, Transmission, and Distribution Standards: Fall Protection

- **Employers generally must ensure that all workers use appropriate fall protection when they are climbing or changing location on poles, towers, or similar structures (§ 1910.269(g)(2), § 1926.954(b))**

Electric Power Generation, Transmission, and Distribution Standards: Fall Protection

- **Personal fall arrest system**: system used to arrest an employee in a fall from a working level
- **Fall restraint system**: fall protection system that prevents the user from falling any distance
- **Work-positioning equipment**: body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a utility pole or tower leg, and work with both hands free while leaning

Electric Power Generation, Transmission, and Distribution Standards: Fall Protection

- **Employees working from aerial lifts**
 - **Personal fall arrest system or**
 - **Fall restraint system**

- **Employees working from a pole, tower, or similar structure at heights greater than 4 ft.**
 - **Personal fall arrest system**
 - **Work-positioning equipment**
 - **Fall restraint system**
 - **Other fall protection meeting Subpart D of general industry standards or Subpart M of construction standards**

Electric Power Generation, Transmission, and Distribution Standards: Minimum Approach Distances

- Applies to work on exposed live parts, or near enough to them to expose the employee to any hazard they present (§ 1910.269(l)(3) and § 1926.960(c)(1))
- Delayed enforcement deadline of *January 31, 2017* due to legal challenges from industry groups
- Employers must establish MADs of at least the distances computed using the tables in the standards

Electric Power Generation, Transmission, and Distribution Standards: Minimum Approach Distances

- **Requirements for voltages over 72.5 kilovolts: employer must determine maximum anticipated per-unit transient overvoltage, phase-to-ground, through an engineering analysis**
- **Employer must ensure that no worker crosses the MAD unless they are appropriately insulated from electrical hazards**

Electric Power Generation, Transmission, and Distribution Standards: Minimum Approach Distances

- **Employer must ensure that no worker crosses the MAD unless they are appropriately insulated from electrical hazards**
 - **Rubber gloves: employee must put them on and take them off where he or she cannot reach into the established MAD**
- **Employee working near exposed parts energized at more than 600 volts but not more than 72.5 kilovolts and is not wearing gloves, protected by insulating equipment covering energized parts, performing work using live-line tools, or performing live-line barehand work, must work from position where he or she cannot reach into established MAD**

Electric Power Generation, Transmission, and Distribution Standards: Electric Arc Protection

- **Employers must assess the workplace to identify workers exposed to hazards from flames or electric arcs (§ 1910.269(l)(8) and § 1926.960(g))**
- **Employers must make reasonable estimate of incident heat energy for every exposed worker**
- **Employers must ensure exposed workers do not wear clothing that could melt or ignite**
- **Employers must require flame resistant protective clothing when estimated incident heat energy exceeds 2.0 cal/cm²**

Electric Power Generation, Transmission, and Distribution Standards: Electric Arc Protection

- **Appendix E provides assessment guidelines with examples**
 - **How to assess the workplace for flame and electric-arc hazards**
 - **Selecting a reasonable incident-energy calculation method under various conditions**
 - **Selecting reasonable parameters for use in calculating incident heat energy – including (1) selecting a reasonable distance from the employee to the arc, and (2) selecting a reasonable arc gap**
 - **How to select clothing that does not ignite**
 - **How to select protective clothing with an acceptable arc rating**
 - **When the standard requires arc-rated head and face protection**

Electric Power Generation, Transmission, and Distribution Standards: Miscellaneous Provisions

- **Training**
 - Degree of training determined by risk for the hazard involved
- **De-energizing distribution and transmission lines**
 - Multiple crews working on same line must either (1) coordinate under single employee or (2) comply independently
- **Protective grounding**
 - Expanded appendix information on equipotential zone

Electric Power Generation, Transmission, and Distribution Standards: Miscellaneous Provisions

- **Underground installations**
 - **Precautions when work could cause cable to fall**
- **Electrical protective equipment**
 - **Updated consensus standards**
- **Foot protection**
 - **Supplementary form of protection**