

July 28, 2006

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**This letter constitutes OSHA's interpretation only of the requirements discussed and may not be applicable to any situation not delineated within the original correspondence.**

Dear Mr. Kante:

Thank you for your February 8, 2005 letter to the Occupational Safety and Health Administration's (OSHA) Directorate of Enforcement Programs. You had questions regarding OSHA's *Safety-Related Work Practices* standard, 29 CFR 1910.333, and OSHA's *Control of Hazardous Energy (Lockout/Tagout)* standard, 29 CFR 1910.147, as they relate to work inside an electrical panel and don related equipment. Your paraphrased scenario, questions, and our responses follow.

**Scenario:** An employee is to perform work inside an electrical panel. The electrical disconnect is open and has been properly locked out. The electrical circuitry below the disconnect has been confirmed to be in a zero energy state by a qualified person using test equipment.

**Question 1:** Is the panel considered de-energized even though there is voltage to one side of the open disconnect? if the panel is not de-energized, would an employee be required to not only disconnect and lockout the power at the electrical panel, in this case a panel at floor level [Location B], but also to disconnect electrical service on-leg or panel upstream in the electrical system [Location A]?

**Response:** Section 1910.333(a)(1) establishes prerequisite criteria that live parts to which an employee may be exposed must be de-energized before an employee works on or near them, unless it is infeasible to do so.<sup>1</sup> If locking and tagging out the circuit at the point of work (i.e., the panel to be worked on) does not de-energize the live parts an employee may contact, the employer needs to assess, on a case-by-case basis, the feasibility of locking and tagging out the circuit further upstream since doing so would de-energize the live parts. If upstream de-energization is infeasible, then the employer is required to use other safety-related work practices, such as the use of electrical protective equipment (e.g., barriers, rubber insulation blankets, gloves, sleeves, covers, insulated tools or handling equipment, in accordance with §1910.137 and §1910.335). Also, if upstream de-energization creates additional or increased hazards, per §1910.333(a)(1) de-energization is not required, and the employer must use other safety-related work practices. In any event, an employee is not required to lockout more than one panel governing the same circuit, if all exposed electrical components in a panel can be de-energized by locking/tagging out a single energy isolation device (at Location A or Location B) that is upstream from where the work is being performed.

The panel in your scenario may be considered de-energized depending on the design of the equipment and the work to be performed. In your scenario, the panel, while not technically de-energized as there is still power to the supply side of the disconnect, provides adequate employee protection if the design and installation of the panelboard is of dead-front construction — i.e., it prevents, through guarding, accidental contact of the employee or conductive objects with energized parts (e.g., the contact points on the fixed side of the switch designed to receive the contact points on the movable portion of the switch, conductor attachment points, conductors with compromised insulation, etc.). if the panel is not of dead-front construction or if the employee removes the panelboard guard, thus exposing live parts, the panel would be considered energized and thus be subject to the requirements of §1910.333(a)(2) (which requires the use of other safety-related work practices) and §1910.333(c)(2) (which allows only qualified persons to work on energized parts.<sup>2</sup>

**Question 2:** Does the employee need to wear full flame-resistant (FR) clothing, head and face protection, and rubber insulating gloves when working on a panel that has been completely de-energized, either disconnecting and locking out the panel itself or by disconnecting and locking out a panel upstream from the panel where the work is being performed?

**Answer:** No. If there are no exposed energized electrical components after a person has locked and tagged out the disconnect, and verified de-energization, per the requirements of §1910.333(b)(2), then there would be no potential for electric shock or arc flash. The protective equipment that you mentioned would not be required.<sup>3</sup> However, personal protective equipment may be required by another condition independent of electrical hazards. For example, if an employee is working in the panel box and using a drill or saw that is creating flying particles, or if the employee is using a chemical that presents a splash hazard to the eyes, the eye and/or face protection may be required.

**Question 3:** Would the protocol of disconnecting and locking out the electrical energy one "leg" upstream from the panel to be worked on be required for the unqualified worker who is servicing the machine supplied by the panel, but not the panel itself?

**Answer:** You have not provided sufficient information for us to be able to answer your question. For example, we cannot determine whether the unqualified employee will be exposed to hazardous energy sources besides the exposed electric circuit parts. If you desire an answer to this question, we need the following information: (1) Will the disconnecting means be opened by a qualified person? (2) Will the unqualified employee be exposed to hazardous energy sources besides the exposed electric circuit parts? (3) Will the opening of the downstream disconnecting means completely isolate the machine and its circuits from hazardous energy?

**Question 4:** If the upstream disconnect [Location A] is higher than eight (8) feet off the ground, is lockout required to control that energy source as well, or can one just shut off power using a switch stick, provided that this disconnecting switch is clearly visible to him or her and the work does not go beyond an employee's shift?

**Answer:** If it is necessary to open a disconnect upstream to de-energize electric equipment as required by §1910.333(b), then the employee would need to follow complete lockout/tagout procedures on the upstream disconnect [Location A]. Neither the location of the disconnecting switch, nor the duration of the project, obviates the need for proper lockout/tagout procedures. The fact that the lockout period does not exceed the employee's shift only allows the employee to place a lock *without* an accompanying tag if only one piece of equipment or machinery is de-energized and the employees exposed to the hazards associated with the re-energizing the circuit of equipment or familiar with this procedure. This exception is noted at §1910.333(b)(2)(iii)(E).

Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA requirements are set by statute, standards, and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employee obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at <http://www.osha.gov>. If you have any further questions, please feel free to contact the Office of General Industry Enforcement at (202) 693-1850.

Sincerely,

Richard E. Fairfax, Director  
Directorate of Enforcement Programs