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December 12, 2012

Mr. Ralph Mosely
REM Safety Consultants, Inc.
3963 South Highway 97, Ste #317
Sandy Springs, Oklahoma 74063

Dear Mr. Mosely:

Thank you for your November 11, 2011, letter to the Occupational Safety and Health Administration's (OSHA's) Directorate of Enforcement Programs (DEP). You asked questions about OSHA's general industry requirements for the control of hazardous energy. We apologize for the delay in responding.

This letter constitutes OSHA's interpretation only of the requirements discussed and may not be applicable to any question not delineated within your original and subsequent correspondence and communications. For brevity, we combined and paraphrased your scenarios and questions; our replies follow.

Background: Your letter inquires about the use of light-emitting-diode (LED) type devices for the purpose of meeting the verification requirements for lockout-tagout procedures under OSHA's general industry standards. You indicated that the device is intended to be field installed and hardwired (connected) to the disconnecting (isolating; that is, the disconnect switch or circuit breaker) device that serves to lock out or tag out the machine. You stated that the LED device is connected to the disconnecting device such that it should illuminate when any individual phase is energized.¹

Further, your letter proposes using these devices as part of the lockout-tagout requirements under two distinctively different work situations and two distinctively different work-practice standards: 29 CFR 1910.147 and 29 CFR Part 1910, Subpart S. Lockout or tagout under 29 CFR 1910.147 "covers the servicing and maintenance of machines and equipment in which the unexpected energization or start up of the machines or equipment, or release of stored energy, could harm employees." (See §1910.147(a)(1)(i)) However, that standard does **not** apply if an employee is **exposed** "to electrical hazards from work on, near, or with conductors or equipment in electric-utilization installations, which is covered by Subpart S." (See §1910.147(a)(1)(ii)(D))

Lockout and tagging under 29 CFR Part 1910, Subpart S covers employee exposure to "contact with parts of fixed electric equipment or circuits which have been deenergized." (See the introductory text to §1910.333(b)(2)) Consequently, Subpart S generally covers employee exposure to electrical hazards during servicing and maintenance, and § 1910.147 generally covers exposure to nonelectrical hazards associated with the unexpected energization or start up of the machines or equipment, or release of stored energy.

Question 1: Can the type of device described above be used to verify that isolation and deenergization of the machine or equipment have been accomplished under 29 CFR 1910.147(d)(6)?²

Response: No. However, the type of device that you describe, if installed correctly and maintained, might serve only as a redundant indicator that the disconnecting device is in the open ("off") position.

After locking out (or tagging out) the equipment, after controlling any potentially hazardous stored energy, and prior to starting any servicing or maintenance work, an authorized employee must verify that **isolation and deenergization** of the machine or equipment have been accomplished (29 CFR 1910.147(d)(6)).

In paragraph (d)(6) of 29 CFR 1910.147, the sixth step of the energy control procedure, the authorized employee must ensure the previous steps of the procedure were taken to isolate the machine or equipment effectively. Prior to starting the servicing or maintenance work, the authorized employee needs to walk down the points of isolation; that is, verify that the machine or equipment is turned off or shut down properly (29 CFR 1910.147(d)(2)); that all energy isolating devices are identified, located, and operated (29 CFR 1910.147(d)(3)); that the lockout or tagout devices are attached to energy isolating devices (29 CFR 1910.147(d)(4)); and that stored energy has been rendered safe (29 CFR 1910.147(d)(5)).

The verification provision of paragraph (d)(6) of 29 CFR 1910.147 requires an affirmative step on the part of an authorized employee to determine if the hazardous energy is effectively isolated, and relying solely on the LED device would not satisfy this requirement. One effective method of compliance would be a deliberate attempt by an authorized employee to start up the equipment, which should not be capable of activation because of the application of the energy control devices. This is an action intended to assure the employee that energy from the main power source has been effectively isolated, that residual or stored energy has been blocked, and that injury could not result from inadvertent activation of the operating controls.

OSHA's Compliance Directive CPL 02-00-147 for the Control of Hazardous Energy explains that, "in most cases, it is only through the use of a test instrument [by a "qualified employee" under 29 CFR 1910, Subpart S] or a deliberate attempt to start-up a machine that the authorized employee will be able to ascertain whether the steps taken to isolate hazardous energy (which were checked through visual inspection techniques [for example, by verifying the position of a disconnect switch handle or that all motion has stopped and that all coasting parts such as flywheels, grinding wheels, saw blades, etc. have come to rest]) actually worked to isolate the energy from the machine."³ [Emphasis added.] The use of a test instrument is particularly applicable for verifying isolation and deenergization in the case of jammed equipment as you also asked about in a telephone communication with an OSHA representative.

Question 2: Can the type of device described above be used to meet the lockout and tagging 29 CFR Part 1910, Subpart S requirements under 1910.333(b)(2)(iv)(B)?⁴

Response: No. However, the type of device that you describe, if installed correctly and maintained, might serve as only a redundant indicator that the disconnecting device is in the open ("off") position.

Lockout and tagout under 29 CFR Part 1910, Subpart S requires that conductors and parts of electric equipment that have been deenergized, but have not been locked and tagged out in accordance with 29 CFR 1910.333(b) by a qualified employee, must be treated as energized parts. Under 29 CFR 1910.333(b)(2)(iv)(B), a qualified employee must use test equipment to test all circuit elements and parts to which employees will be exposed and verify the circuit elements and parts are deenergized.

Regarding verifying deenergization, OSHA's Compliance Directive CPL 02-00-147 for the Control of Hazardous Energy explains that "a qualified person must use test equipment to verify de-energization by testing the electric circuit elements and equipment parts to which employees will be exposed," and that "[a] test is also required to check for any voltage even though specific parts of a circuit have been deenergized and presumed safe because it is possible, under certain conditions, to feed circuits from the load side (e.g., back-feed; short circuit) or to have induced voltage."⁵ [Emphasis added.] The device that you describe does not meet the requirements of the standard to provide that assurance.

Question 3: Could an employee, who may or may not be a qualified person (under 29 CFR Part 1910, Subpart S), use the LED-type devices and implement the detailed sequential procedure that was included in your initial correspondence to verify that any circuit elements and equipment are deenergized before an employee, who may or may not be a qualified person, works on or near them?

Response: No. Under 29 CFR 1910.333(b)(2)(iv)(B), a **qualified person** must **use test equipment** to test the circuit elements and parts of electric equipment to which employees will be exposed and verify that they are deenergized.

This test must determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe; that is, the qualified person must determine that the electric circuit elements and equipment parts are at a **zero-energy (zero volts) state**. In this regard, the LED-type alerting devices not are test equipment. In addition, §1910.333(b)(2)(iv)(B) generally does not permit testing a circuit at a point remote from the circuit elements and equipment parts to which the employee will be exposed. This provision protects employees in the event that the wrong circuit is deenergized or the employee works on the wrong circuit - one that is not deenergized.

Question 4: Is there an option to use a different verification procedure other than the procedure specified under 29 CFR 1910.333(b)(2)(iv)(B)?

Response: No. As explained in Note 2 to 29 CFR 1910.333(b)(2), "[l]ockout and tagging procedures that comply with paragraphs (c) through (f) of 1910.147 will also be deemed to comply with paragraph (b)(2) of this section provided that: [1] The procedures address the electrical safety hazards covered by this Subpart; and [2] The procedures also incorporate the requirements of paragraphs (b)(2)(iii)(D) and (b)(2)(iv)(B) of [section 29 CFR 1910.3331]."

Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA's requirements are set by statute, standards, and regulations. Our letters of interpretation do not create new or additional requirements but rather explain these requirements and how they apply to particular circumstances. This letter constitutes OSHA's interpretation of the requirements discussed. From time to time, letters are affected when the Agency updates a standard, a legal decision impacts a standard, or changes in technology affect the interpretation. To assure that you are using the correct information and guidance, please consult OSHA's website at <http://www.osha.gov>. If you have further questions, please feel free to contact the Directorate of Enforcement Programs at (202) 693-2100.

Sincerely,

Thomas Galassi, Director
Directorate of Enforcement Programs

¹ The LED-type indicating unit has four leads coming out of it; three leads are connected at the respective phases (or poles) of the disconnecting (isolating) device, and the fourth lead is connected to neutral or ground. A redundant set of LEDs is provided for each indicated function-L1, L2; L3: and GND. [Return to Text]

² Section 1910.147(d)(6), Verification of isolation, requires that "[p]rior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished." [Return to Text]

³ See page 3-52 at: [CPL 02-00-147, The Control of Hazardous Energy - Enforcement Policy and Inspection Procedures] [Return to Text]

⁴ 29 CFR 1910.333(b)(2)(iv)(B) requires: "A qualified person shall use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and shall verify that the circuit elements and equipment parts are deenergized. The test shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment shall be checked for proper operation immediately after this test." [Return to Text]

⁵ idem. [Return to Text]

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