



DEC 5 2011

Reply to the attention of:

DEP/GIE/RI/20879

Mr. Eric Street
Konecranes, Inc
4401 Gateway Boulevard
Springfield, Ohio 45502

Dear Mr. Street:

Thank you for your June 18, 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 grounding overhead cranes and hoists. This letter constitutes OSHA's interpretation only of the requirements discussed and may not be applicable to any question not delineated within your original correspondence. Your paraphrased scenarios and questions and our replies follow.

Question 1: With respect to electrically operated overhead cranes and hoists, does OSHA require the equipment to have a connection to ground via a separate equipment grounding conductor and prohibit the path to ground from going through the wheel bearings, lubrication, and the wheel-to-rail contact surface?

Response: OSHA's standard does not specify this requirement. However, the crane equipment you discuss in your request travels on wheels in contact with supporting rails. Where a separate conductor rail is not provided as the low-impedance path for ground-fault current, the grounding path for the crane equipment, whether through the wheel bearings and lubrication and through the wheel-to-rail contact surface or otherwise, must meet the requirements of OSHA's standards. OSHA requires the frames and tracks of electrically operated cranes and hoists to be grounded such that "[t]he path to ground from circuits, equipment, and enclosures shall be permanent, continuous, and effective." 29 CFR 1910.304(g)(5) and (g)(7).¹

Therefore, to the extent that the employer ensures that the path to ground through the wheels will be "permanent, continuous, and effective," the employer may ground the crane through the wheels. However, OSHA notes that there are a number of substances that could be initially present, or develop through usage, that could potentially prevent the ground path through the wheels from being "permanent, continuous, and effective." These insulating materials include, but are not limited to, paint, rust, dirt accumulation, and even animal nests and carcasses. OSHA further cautions employers that the most

¹ 29 CFR 1910.304(g)(5) requires that "[t]he path to ground from circuits, equipment, and enclosures shall be permanent, continuous, and effective." 29 CFR 1910.304(g)(7) includes a requirement, as follows, for cranes and hoists: "The metal parts of the following nonelectrical equipment shall be grounded: frames and tracks of electrically operated cranes and hoists."

recent editions of the National Electrical Code (NEC) (2005, 2008, and 2011) include a general prohibition on grounding equipment through the bridge and trolley wheels.²

Question 2: Does OSHA have any grandfather-type exceptions regarding the grounding requirements for overhead cranes and hoists?

Response: No. Although there is a grandfather provision in 29 CFR 1910.179(b)(2),³ it applies to the design of overhead and gantry crane equipment and not to how that equipment is installed and connected at a facility. According to 29 CFR 1910.179(g)(1)(i), all crane installations must comply with 29 CFR Part 1910 Subpart S, which contains grounding requirements in §§1910.304(g)(5) and (g)(7). Existing crane equipment is not grandfathered (excepted) from these requirements based on the date the equipment was designed or installed. See §1910.302(b)(1) (“The following requirements apply to all electrical installations and utilization equipment, regardless of when they were designed or installed: * * * §1910.304(g)(5)—Grounding—Grounding path . . . §1910.304(g)(7)—Grounding—Nonelectrical equipment.”).

Question 3: In crane applications, can a separate grounded conductor (neutral) or an equipment grounding conductor be the same color as the other conductors (e.g., can all conductors including the grounded and equipment grounding conductors be red)?

Response: Response: No. As previously stated, 29 CFR 1910.179(g)(1)(i) requires crane installations to comply with 29 CFR Part 1910 Subpart S. In Subpart S, OSHA has two separate provisions, 29 CFR 1910.304(a)(1)(i) and (a)(1)(ii), which require that a grounded conductor and an equipment grounding conductor, respectively, must each be identifiable and distinguishable from all other conductors.⁴ In general, as noted in the NEC at 200.6 and 250.119, grounded conductors are white or natural gray in color or markings, and equipment grounding conductors are bare (uninsulated) or are green in color or marking. Additionally, in light of your inquiry addressed in Question 2, older installations are not grandfathered from the requirements of CFR 1910.304(a)(1)(i) and (a)(1)(ii).

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.

² The National Electrical Code, NFPA 70, is available from the National Fire Protection Association, One Batterymarch Park, Quincy, Massachusetts 02169-7471. Article 610—Cranes and Hoists—of the 2005, 2008, and 2011 Editions contains provision 610.61, which requires, in part, that “[t]he trolley frame and bridge frame shall not be considered as electrically grounded through the bridge and trolley wheels and its respective tracks,” and that “[a] separate bonding conductor shall be provided.”

³ 29 CFR 1910.179 is OSHA’s standard for overhead and gantry cranes, including their integral hoists. Paragraph (b)(2) of that standard requires that all new equipment constructed or installed on or after August 31, 1971, must meet the design specifications of the American National Standard Safety Code for Overhead and Gantry Cranes, ANSI B30.2.0-1967. Although this is a grandfather-type provision, it would not apply to the installation requirements.

⁴ Paragraph (a)(1)(i) of 29 CFR 1910.304 requires that “[a] conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors.” Paragraph (a)(1)(ii) requires that “[a] conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.”

Our interpretation letters explain the requirements, and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. In addition, 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,

A handwritten signature in cursive script, appearing to read "Tom Galassi", written in black ink.

FOR Thomas Galassi, Director
Directorate of Enforcement Programs