Cranes and Derricks in Construction
OSHA Narrative on Articulating/Knuckle-Boom Truck Cranes

Paragraph (c)(17) Delivery of Material to Construction Sites

1. It is common for material that is to be used in construction work to be delivered to the construction site on a truck equipped with a lifting attachment that is used either to place the materials on the ground or to place them on the structure. For example, articulating/knuckle-boom truck cranes are often used to deliver bundles of drywall to the site and then move the bundles from the truck up to a floor of the building under construction. To the extent these cranes are used in "construction work," they fall within the scope of this final rule as defined in §1926.1400(a).\(^1\)

2. OSHA has long taken the view that an employer who delivers materials to a construction site is not engaged in "construction work" if that employer’s work once at the site is limited to simply placing/stacking the materials on the ground. OSHA requested comment from the public on whether the final rule should include an explicit exclusion to this effect (see 73 FR 59731, Oct. 9, 2008).

3. Most commenters on this issue favored such an exclusion to clarify that such equipment was not being used in construction. (ID–0145.1; –0147.1; –0165.1; –0184.1; –0206.1; –0218.1; –0232.1; –0233.1; –0235.1; –0299.1.) Certain commenters expressed the view that any such exclusion should also extend to delivery of materials onto structures at the construction site because, in their view, this was also not a construction activity. (E.g., ID–0184.1; –0233.1; –0235.1.) Some of these commenters represented employers who deliver building materials such as lumber, drywall, and roofing materials. (See, e.g., ID–0184.1; –0233.1.) Others represented employers in the heating, ventilation, air conditioning, and refrigeration (HVACR) industry. (ID–0165.1; –0235.1.) Several of the commenters pointed to the operator training and/or certification requirements in §1926.1427 of the proposed rule as particularly burdensome given the distinctions between delivery activities and what they characterized as the more complex activities typically associated with the equipment covered by the proposed rule. (ID–0165.1; –0184.1; –0218.1; –0231.1; –0233.1; –0235.1.)

4. OSHA notes some commenter confusion regarding instances when the construction materials are not delivered to the curb or a stockyard but instead to a designated area on the construction site where the materials are staged/organized to facilitate hoisting activities. In these scenarios, OSHA construction standards apply. See, e.g., Letter to Johnson (2/6/08)\(^a\) (stacking of materials), Letter to Reynolds (1/5/01)\(^a\) (delivery of materials onto structure). When hoisting equipment is used to arrange the materials in a particular sequence for hoisting or to lift materials onto a structure that is under construction, it is being used to expedite work that is integral to the construction process and is, therefore, construction work. However, to remain consistent with existing compliance guidance, this final rule states that when lifting equipment is used solely to deliver building supply materials from a supplier to a construction site by placing/stacking the materials on the ground, without arranging the materials in a particular sequence for hoisting, OSHA does not regard the delivery process as a construction activity. OSHA believes that this limited and conditional exclusion will exclude this

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\(^1\) This narrative begins on page 47927 in Volume 75, Number 152 of the Federal Register (August 9, 2010). Paragraphs are numbered for purposes of organization and analysis.

Text From 75 F.R. 47927 et seq. (OSHA final rule on Cranes and Derricks in Construction)

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equipment when used to perform such deliveries and address the concerns of commenters who only deliver construction materials to the ground.

5. Construction typically consists of a process of assembling and attaching (or in some cases, disassembling) a vast variety of materials to form a building or other structure. In building construction, those materials typically include small, individual items (a few examples include: nails, lumber, pipes, duct work sections, electrical items, sheet goods), large individual items (a few examples include: structural steel or precast concrete columns and beams), and prefabricated structural and building system components (a few examples include: roof trusses, precast concrete wall sections, and building machinery such as boilers, pumps, and air handling equipment). All of these items must be delivered to the jobsite and unloaded from the vehicle delivering them before they can be used in the building or structure.

6. C–DAC indicated that to facilitate the assembling or attaching of such items, cranes and derricks are often used to hoist and hold, support, stabilize, maneuver, or place them. Sometimes they are used to place items in a convenient location for subsequent use. For example, they are often used to place a bundle of steel decking sheets onto the structure for later “shaking out” (i.e., after being landed on the structure, workers “break” the bundle and distribute the decking sheets for subsequent attachment). One of OSHA’s construction standards contains specific requirements related to the landing and placing of such bundles (see § 1926.754(e)(1)).

7. Sometimes cranes and derricks are used to place an item in a specific location for immediate attachment. For example, cranes are typically used to precisely place steel columns on concrete footings, which involves aligning holes at the column’s base with anchor rods/bolts in the footing so that the column can be secured to the footing. In building and bridge construction, cranes are often used to precisely place precast concrete members so that workers can attach them to other precast members (or sometimes to a structural steel frame).

8. Cranes are also used to place precast concrete components so that other items can be connected to them. For example, in utility and sewer construction, precast concrete manholes or vaults are placed for proper alignment with utility pipes; in residential construction, precast concrete septic systems are placed for proper location in an excavation. Clearly, such movement and placement of material by cranes and derricks is integral to the construction process, and the fact that this may be done by the vehicle that delivered the material to the site does not make it a non-construction activity.

9. Cranes are also commonly used to hoist building materials onto a structure for subsequent use. Although this is also a construction activity, OSHA determines that a limited exclusion for articulating/knuckle-boom truck cranes used for such work is appropriate to minimize having this equipment move in and out of coverage of this rule.

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2 Construction also includes the deconstruction or demolition of a portion, or all, of a structure.

3 Moving building materials onto a structure for subsequent use is an integral part of the construction process. This is the case whether the materials are brought onto the structure by hand, with the aid of a crane after the materials had been previously delivered to the ground, or by the same equipment that brought them to the site. See e.g., January 5, 2001, Letter of Interpretation to Mr. Jeff Reynolds, Division Safety Manager Pacific Supply, available at http://www.osha.gov.
10. The record shows that articulating/knuckle-boom truck cranes are often used to deliver sheet goods (e.g., drywall), or packaged materials (e.g., roofing shingles) to construction sites and that it is common for the delivery to be made onto the structure. Delivering material to a structure can pose a hazard that is typically not present when material is placed on the ground: when the boom is extended, as when lifting the material to an upper floor, the possibility of exceeding the crane’s rated capacity, with the resultant possibility of boom collapse and crane tipover, is present. A representative of a material delivery trade association testified that articulating/knuckle-boom cranes are equipped with automatic safety systems that detect whether the crane is close to being overloaded and automatically prevent such overloading. (ID–0341; –0380.1; –0381.1.)

11. The representative described a test on a crane with a load of 2,900 pounds and a maximum extension of 78 feet, 11 inches, and said that the automatic device preventing the boom from extending beyond its maximum safe length for that load and angle of 46 feet. (ID–0341.) Thus, with a load that is typical of the loads that are often delivered, the hazard of the crane collapsing exists with the boom at far less than its maximum possible extension. Another representative of the material delivery industry, also noted the presence of such devices on the equipment used by its members and, while it asked for such equipment to be exempt completely from this rule, alternatively suggested an exemption for equipment with such devices installed. (ID–0184.1.)

12. OSHA is, to a large extent, adopting the commenter’s suggestion. The overloading and subsequent collapse of cranes is one of the primary hazards this final rule seeks to address. The trade association witness’s testimony shows that the potential for collapse is present when articulating/knuckle-boom cranes are used to deliver materials onto a structure. The industry has, however, addressed this hazard by equipping such cranes with automatic overload prevention devices. Therefore, OSHA is excluding articulating/knuckle-boom cranes used to deliver materials onto a structure from the final rule, but only when the cranes are equipped with properly functioning automatic overload prevention devices. Without such a device, the crane is subject to all provisions of this final rule. It should be noted that electrical contact with power lines is another serious hazard covered by the final rule. The limited exemption for articulating/knuckle-boom cranes used for certain construction operations also exempts this equipment from the requirements for operations near power lines contained in the final rule. When performing an exempt operation, this equipment (like most of the other exempt equipment and operations) will be covered by revised § 1926.600(a)(6).\(^\text{v}\)

13. OSHA is limiting this exclusion to the delivery of sheet goods and packaged materials including, but not limited to: sheets of sheet rock, sheets of plywood, bags of cement, sheets or packages of roofing shingles, and rolls of roofing felt. The placement of other materials on a structure under construction is the type of core construction activity this rule seeks to address, and excluding the hoisting and movement of other types of materials, such as precast concrete members, prefabricated building sections, or structural steel members, would severely reduce the rule’s effectiveness. Moreover, equipment used to lift these types of materials on construction sites is rarely, if ever, used for non-construction activities on those sites and does not often present the problem of equipment moving in and out of coverage when used for different activities.

14. OSHA is also limiting the exclusion by making it clear that it does not apply when the crane is used to hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure. For example, while placing a
package of shingles onto the roof of a structure would fall within the exemption, suspending the shingles in the air and moving them to follow the progress of the roofer would not. When the crane is being used to facilitate the construction activity, it has exceeded the “delivery” of goods and is therefore engaged in a process that is more complex than the scenarios addressed by the commenters who supported an exclusion for materials delivery. OSHA is also concerned that exempting this activity would provide an incentive for employers to use materials delivery cranes for other purposes, thereby undermining the rationale for the materials delivery exclusion.

15. In particular, OSHA declines to exclude the handling of HVACR units, as some commenters urged. Using a crane to deliver HVACR equipment is an example of using a crane to hoist and position a component of the building’s mechanical systems, which is an integral part of the construction process. According to one industry commenter, during a typical installation of a large commercial rooftop HVACR unit, a mobile crane delivers the equipment to its intended location on the roof, where an HVACR technician connects the equipment to the ventilation system. (ID–0165.1) Thus, unlike sheet goods and packaged materials, which are not placed in their location of final use by the delivery vehicle, delivery of HVACR equipment may be integral to its installation. Like the hoisting and movement of other building components, use of cranes and derricks to move HVACR equipment falls squarely within this rule.

16. OSHA also received a comment from a representative of the precast concrete industry requesting the exclusion of equipment used to deliver materials such as concrete manholes, septic tanks, burial vaults, concrete block, and concrete pipe. (ID–0299.1) This commenter stated that their portion of the precast concrete industry solely delivers materials to a construction site, and believed that they simply supply materials for a construction project but are not involved in actual construction. (ID–0299.1)

17. OSHA agrees that in circumstances where the equipment is used solely to deliver these types of concrete materials from a supplier to a construction site by placing/stacking the materials from the delivery vehicle to the ground in, for example, a storage or staging area, without arranging the materials in a particular sequence for subsequent hoisting, the equipment is not being used for a construction activity. However, if the equipment is used to hoist, hold, support, stabilize or place precast concrete material as part of the installation process, it is engaged in a construction activity and would be subject to this rule. For example, a truck-mounted articulating crane may be used to maneuver a precast component such as a vault or concrete pipe from the truck to its installation point in an excavation. As previously discussed, such use is a typical construction activity.

18. To summarize, when a delivery vehicle is used solely to deliver building supply materials from a supplier to a construction site by placing/stacking the materials on the ground, without arranging the materials in a particular sequence for hoisting, the equipment is not being used for a construction activity and is not subject to this rule. When an articulating/knuckle-boom truck crane that brings material to a site is used to transfer building supply sheet goods or building supply packaged materials from the vehicle onto a structure, the activity is a construction activity but the crane is excluded from this rule if it is equipped with a properly functioning automatic overload prevention device and satisfies the other requirements of the exception in § 1926.1400(c)(17). All other equipment that falls under § 1926.1400(a) is subject to this rule when delivering materials onto a structure.
19. OSHA is including in the final rule a new § 1926.1400(c)(17) to clarify the circumstances under which material delivery is subject to the rule. Paragraph (c)(17)(i) excludes from the scope of this standard an articulating/knuckle-boom truck crane that delivers material to a construction site when it is used to transfer materials from it to the ground, without arranging the materials in a particular sequence for hoisting.

20. Paragraph (c)(17)(ii) contains the exclusion for an articulating/knuckle-boom truck crane that delivers material to a site when it is used to transfer building supply sheet goods or building supply packaged materials from it onto a structure, using a fork/cradle at the end of the boom. This provision conditions this exclusion on the truck crane being equipped with a properly functioning automatic overload prevention device and lists examples of the sheet goods or packaged materials that qualify for the exclusion, stating that these include, but are not limited to: sheets of sheet rock, sheets of plywood, bags of cement, sheets or packages of roofing shingles, and rolls of roofing felt. These are typical building supply materials that pose a reduced risk of falling when being lifted by the truck crane because of their configuration and/or packaging, and because the truck crane was designed to safely handle this type of material.

21. Any delivery activities not excluded under paragraphs (c)(17)(i) and (ii) are subject to the standard. However, to avoid any possible ambiguity on this point, OSHA has included paragraph (c)(17)(iii). Paragraphs (c)(17)(iii)(A)–(C) list explicit activities for which the exclusion does not apply. Paragraph (c)(17)(iii)(D) is included to avoid any possible implication that paragraphs (c)(17)(iii)(A)–(C) represent an exclusive list of delivery activities that are subject to the final rule.

**RULE TEXT APPLICABLE TO ARTICULATING/KNUCKLE-BOOM TRUCK CRANES – (17) Material Delivery**

(i) Articulating/knuckle-boom truck cranes that deliver material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting.

(ii) Articulating/knuckle-boom truck cranes that deliver material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a properly functioning automatic overload prevention device. Such sheet goods or packaged materials include, but are not limited to: Sheets of sheet rock, sheets of plywood, bags of cement, sheets or packages of roofing shingles, and rolls of roofing felt.

(iii) This exclusion does not apply when:

(A) The articulating/knuckle-boom crane is used to hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure;

(B) The material being handled by the articulating/knuckle-boom crane is a prefabricated component. Such prefabricated components include, but are not limited to: Precast concrete members or panels, roof trusses (wooden, cold-formed metal, steel, or other
material), prefabricated building sections such as, but not limited to: Floor panels, wall panels, roof panels, roof structures, or similar items;

(C) The material being handled by the crane is a structural steel member (for example, steel joists, beams, columns, steel decking (bundled or unbundled) or a component of a systems-engineered metal building (as defined in 29 CFR 1926 subpart R).

(D) The activity is not specifically excluded under § 1400(c)(17)(i) and (ii).

1 (a) This standard applies to power operated equipment, when used in construction, that can hoist, lower and horizontally move a suspended load. Such equipment includes, but is not limited to: Articulating cranes (such as knuckle-boom cranes); crawler cranes; floating cranes; cranes on barges; locomotive cranes; mobile cranes (such as wheel-mounted, rough-terrain, allterrain, commercial truck-mounted, and boom truck cranes); multi-purpose machines when configured to hoist and lower (by means of a winch or hook) and horizontally move a suspended load; industrial cranes (such as carrydeck cranes); dedicated pile drivers; service/mechanic trucks with a hoisting device; a crane on a monorail; tower cranes (such as a fixed jib, i.e., “hammerhead boom”), luffing boom and self-erecting); pedestal cranes; portal cranes; overhead and gantry cranes; straddle cranes; sideboom cranes; derricks; and variations of such equipment. However, items listed in paragraph (c) of this section are excluded from the scope of this standard.


iv § 1926.600 Equipment. (a) General Requirements. * * * (6) All equipment covered by this subpart shall comply with the following requirements when working or being moved in the vicinity of power lines or energized transmitters, except where electrical distribution and transmission lines have been deenergized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines: (i) For lines rated 50 kV or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet; (ii) For lines rated over 50 kV, minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but never less than 10 feet; (iii) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 kV, and 10 feet for voltages over 50 kV, up to and including 345 kV, and 16 feet for voltages up to and including 750 kV; (iv) A person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means; (v) Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation; (vi) Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded; (vii) Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages: (A) The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and (B) Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles
having large alligator clips or other similar protection to attach the ground cable to the load. (C) Combustible and flammable materials shall be removed from the immediate area prior to operations.