



Reply to the attention of:

AUG 24 2009

Letter #20090424-8992:

Re: Application of OSHA's *de minimis* policy to the requirements of 29 CFR 1926.452(o)(3) and 29 CFR 1926.552(c)(1) – 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16) regarding certain chimney construction work

This letter replaces a letter of interpretation to Mr. William Nolan dated February 8, 2007 concerning the application of OSHA's *de minimis* policy to the requirements of 29 CFR 1926.452(o)(3) and 29 CFR 1926.552(c)(1) – 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16) regarding certain chimney construction work.¹ OSHA's initial response was based, in part, on permanent variances granted from the aforementioned requirements to employers engaged in comparable chimney construction work. As noted in the letter, OSHA updates its guidance from time to time in response to new information. Since its initial response, OSHA received several requests from chimney-construction employers for permanent variances from the same requirements. During its review of the subsequent permanent variance requests, OSHA identified several hazards that the aforementioned requirements protect against that the discussed alternative hoist system does not address. Accordingly, the Agency has determined that it is necessary to add certain conditions to the application of the *de minimis* policy to address these hazards.

Background: OSHA has previously granted certain chimney-construction employers permanent variances² from several personnel hoist requirements (29 CFR 1926.552(c)(1) through 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16)), as well as from the tackle requirements for boatswains' chairs (29 CFR 1926.452(o)(3)).

These employers were constructing, remodeling, repairing, maintaining, inspecting, and demolishing tall chimneys made of reinforced concrete, brick, and steel. This work requires the employers to transport employees and construction material to and from elevated work platforms and scaffolds located inside and outside tapered chimneys. While tapering contributes to the stability of a chimney, it necessitates frequent relocation of, and adjustments to, the work platforms and scaffolds so that they will fit the decreasing circumference of the chimney as construction progresses upwards.

¹ The original letter, with modifications, is included below.

² These variances were granted pursuant to Section 6(d) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655) and 29 CFR 1905.11.

Each of these employers successfully demonstrated in its permanent variance application that complying with the requirements of 29 CFR 1926.552(c)(1) through 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16) and 29 CFR 1926.452(o)(3) would result in access problems posing a serious risk to the employees.

Furthermore, each of these employers proposed the same or similar alternative methods and procedures to the OSHA requirements for protecting the employees while being transported to and from their elevated worksites during chimney construction and repair. These alternative methods and procedures provided the basis for the *de minimis* policy explained in the February 8, 2007 letter of interpretation.

Additional Conditions

OSHA has identified additional hazards associated with the alternative hoist system and is adding supplemental conditions to its *de minimis* policy to address these hazards. The hazards and additional conditions are discussed individually below.

Shearing hazard: §1926.552(c)(1) and §1926.552(c)(2)

Section 1926.552(c) provides:

(c) *Personnel hoists.*

(1) Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used for exit or entrance to the structure shall be enclosed to a height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such floors or scaffolds.

(2) Towers inside of structures shall be enclosed on all four sides throughout the full height.

* * *

Subparagraphs (c)(1) and (c)(2) of §1926.552 require the enclosure of personnel hoist towers. This requirement guards against the shearing hazard presented by the tower if employees' limbs or other body parts can extend outside the hoist car as the hoist car moves up and down. During construction of a chimney, scaffolding, landings, and/or work platforms may be present in the chimney's interior. If the personnel hoist utilized in the alternative hoist system passes through platforms at the top or intermediate landings during operations, employees riding in the personnel platform or boatswains' chair would potentially be exposed to a similar shearing hazard. The scaffolding, work platforms, or similar structures could shear, crush, or inflict other serious injuries to a hand, arm, foot, leg, or other body part that extends beyond the personnel platform or boatswains' chair.

To prevent these injuries, OSHA believes that employees who use these devices must be able to recognize shearing hazards at the worksite and how to avoid them. Therefore, OSHA has added a condition requiring employers to train employees in the recognition and avoidance of such hazards. Additionally, OSHA has added a condition requiring employers to attach readily visible warnings of the hazards to personnel platforms and

boatswains' chairs. OSHA believes these warnings will supplement and reinforce the required hazard training by reminding employees of the hazard and how to avoid it.

Fall hazard: §1926.552(c)(8)

With respect to doors and gates for a hoist tower, §1926.552(c)(8) states: "Doors or gates shall be provided with electric contacts which do not allow movement of the hoist when door or gate is open." In addition to the shearing hazard discussed above, this interlock requirement also protects against possible fall hazards as employees could be ejected from a moving car through an open door or gate. OSHA believes employees utilizing the alternative hoist system discussed in the February 8, 2007 could be exposed to a similar fall hazard.

The original conditions stated in the February 8, 2007 letter lacked a requirement to ensure employees riding in personnel cages utilized fall protection systems.³ While the original conditions require personnel cages to have mechanical locks on gates to prevent accidental opening, the lock only protects against a fall hazard when the gate is in a closed position. Since the hoist system may continue to operate with open doors or gates, employees may be exposed to potential fall hazards and the risk of ejection from the personnel cage. To address this hazard, OSHA has added conditions requiring the use of personal fall-arrest systems in accordance with §1926.502(d) during travel in a personnel cage, as well as suitable anchorage points within the personnel cage for the fall protection systems.

Struck-by hazards: §1926.552(c)(1), §1926.552(c)(2), and §1926.552(c)(8)

The enclosure requirements in §1926.552(c)(1) – (c)(2), in conjunction with the interlock requirement in §1926.552(c)(8), protect against the struck-by hazard posed by a descending transport device to employees who are near the bottom-landing area of the personnel hoist tower. The required enclosures and interlocks serve to minimize the potential for employees to enter the area beneath the transport device, where the employees would be exposed to the struck-by hazard. The alternative hoist system that has been utilized by chimney-construction employers poses a similar hazard in that a descending transport device, such as a personnel cage, personnel platform, or boatswains' chair, could strike an employee who is in or near the bottom-landing area of the hoist system. During descent, it also is difficult for employees in or on these devices to know if an employee is beneath them who may be unaware of the descending device.

OSHA has added a condition requiring employers to establish an exclusion zone around the bottom landing of the hoist system to address the struck-by hazard posed by a descending transport device. The condition requires employers to ensure that employees enter the exclusion zone only to access a transport device that is in the area circumscribed by the exclusion zone, and only when the hoist system is not in operation.

³ Note that the original conditions required employees to use body harnesses, lanyards, and lifelines while riding on boatswains' chairs and personnel platforms.

Additional Modifications

OSHA has also made minor revisions to the February 8, 2007 letter for purposes of clarity. First, OSHA has removed references to the hoist system as a "rope guided hoist system." OSHA notes that this prior description is not completely accurate since the hoist system does not utilize guide ropes for operations involving personnel platforms and boatswains' chairs. OSHA believes referring to the system as a hoist system, rather than a rope guided hoist system, will avoid potential confusion. Second, with respect to fall protection, OSHA has removed the reference to §1926.104 to make clear that required personal fall arrest systems must comply with criteria provided by §1926.502(d).

Sincerely,

Richard E. Fairfax, Acting Director
Directorate of Construction

NOTE: 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 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. 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>.

February 8, 2007

Mr. William Nolan
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Re: Application of OSHA's *de minimis* policy to the requirements of 29 CFR 1926.452(o)(3) and 29 CFR 1926.552(c)(1) – 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16) regarding certain chimney construction work.

Dear Mr. Nolan:

This is in response to your letter dated May 5, 2005, to the Occupational Safety and Health Administration (OSHA) regarding the provisions that regulate the tackle used for boatswains' chairs (29 CFR 1926.452(o)(3)), as well as the provisions specified for personnel hoists in 29 CFR 1926.552(c)(1) through 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16). We apologize for the delay in responding.

Background: Since 1973, OSHA has granted 16 chimney-construction employers permanent variances¹ from several personnel hoist requirements (29 CFR 1926.552(c)(1) through 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16)), as well as from the tackle requirements for boatswains' chairs (29 CFR 1926.452(o)(3)).

These employers were constructing, remodeling, repairing, maintaining, inspecting, and demolishing tall chimneys made of reinforced concrete, brick, and steel. This work requires the employers to transport employees and construction material to and from elevated work platforms and scaffolds located inside and outside tapered chimneys. While tapering contributes to the stability of a chimney, it necessitates frequent relocation of, and adjustments to, the work platforms and scaffolds so that they will fit the decreasing circumference of the chimney as construction progresses upwards.

Each of the 16 employers successfully demonstrated in its permanent variance application that complying with the requirements of 29 CFR 1926.552(c)(1) through 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16) and 29 CFR 1926.452(o)(3) would result in access problems posing a serious risk to the employees.

¹ These variances were granted pursuant to Section 6(d) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 655) and 29 CFR 1905.11. The *Federal Register* citations for these variances are: 38 *FR* 8545 (April 3, 1973), 44 *FR* 51352 (August 31, 1979), 50 *FR* 20145 (May 14, 1985), 50 *FR* 40627 (October 4, 1985), 52 *FR* 22552 (June 12, 1987), 68 *FR* 52961 (September 8, 2003), 70 *FR* 72659 (December 6, 2005), and 71 *FR* 10557 (March 1, 2006).

Furthermore, each of these employers proposed the same or similar alternative methods and procedures to the OSHA requirements for protecting the employees while being transported to and from their elevated worksites during chimney construction and repair.

We have paraphrased your question as follows:

Question: Scenario: We are a chimney construction employer performing work similar to these previous applicants, requesting a permanent variance from the same personnel hoist and boatswains' chairs tackle requirements, and proposing to use the same or similar alternative apparatus and procedures as the previous employers requested. Based on the previous variance requests and grants to 29 CFR 1926.552(c)(1) through [1926.552(c)(4)], [1926.552(c)(8)], [1926.552(c)(13)], [1926.552(c)(14)(i)], and [1926.552(c)(16)] and 29 CFR 1926.452(o)(3), will OSHA permit us to use the most current alternative procedures outlined in the granted permanent variance applications without waiting for the Agency to grant us a permanent variance?

Answer: Title 29 CFR 1926.452(o)(3) states:

(o) *Single-point adjustable suspension scaffolds.*

* * *

(3) Boatswains' chair tackle shall consist of correct size ball bearings or bushed blocks containing safety hooks and properly "eye-spliced" minimum five-eighth (5/8) inch (1.6 cm) diameter first-grade manila rope, or other rope which will satisfy the criteria (e.g. strength and durability) of manila rope.

Title 29 CFR 1926.552(c) states (in part):

(c) *Personnel hoists.* (1) Hoist towers outside the structure shall be enclosed for the full height on the side or sides used for entrance and exit to the structure. At the lowest landing, the enclosure on the sides not used for exit or entrance to the structure shall be enclosed to a height of at least 10 feet. Other sides of the tower adjacent to floors or scaffold platforms shall be enclosed to a height of 10 feet above the level of such floors or scaffolds.

(2) Towers inside the structure shall be enclosed on all four sides throughout the full height.

(3) Towers shall be anchored to the structure at intervals not exceeding 25 feet. In addition to tie-ins, a series of guys shall be installed. Where tie-ins are not practical the tower shall be anchored by means of guys made of wire rope at least one-half inch in diameter, securely fastened to anchorage to ensure stability.

(4) Hoistway doors or gates shall be not less than 6 feet 6 inches high and shall be provided with mechanical locks which cannot be operated from the landing side, and shall be accessible only to persons on the car.

* * *

(8) Doors or gates shall be provided with electric contacts which do not allow movement of the hoist when door or gate is open.

* * *

(13) An emergency stop switch shall be provided in the car and marked "Stop."

(14) Ropes:

(i) The minimum number of hoisting ropes used shall be three for traction hoists and two for drum-type hoists.

* * *

(16) All personnel hoists used by employees shall be constructed of materials and components which meet the specifications for materials, construction, safety devices, assembly, and structural integrity as stated in the American National Standard A10.4-1963, Safety Requirements for Workmen's Hoists. The requirements of this paragraph (c)(16) do not apply to cantilever type personnel hoists.

Problems associated with compliance with 29 CFR 1926.452(o)(3)

The primary purpose of §1926.452(o)(3) is to allow an employee to safely control the ascent, descent, and stopping locations of the boatswains' chair. However, as explained in past variance applications, because of space limitations in these chimneys, the required tackle is difficult or impossible to operate on some chimneys that are over 200 feet tall. Where that is the case, employers can sometimes use a hoist system to raise or lower employees in a personnel cage to work locations both inside and outside a chimney. However, use of a personnel cage for this purpose is in some cases infeasible because of limited space. A personnel platform can be used in such cases except when available space makes its use infeasible. In those instances it is necessary to use a boatswains' chair to lift employees to work platforms. The boatswains' chair, though, is needed only for reaching elevations above the last work location that the personnel platform can reach. Furthermore, when the structural arrangement precludes the safe use of the block and tackle required by 29 CFR 1926.452(o)(3), it is necessary to attach the boatswains' chair directly to the hoisting cable of the ~~rope-guided~~ hoist system described below under "De minimis policy."

Problems associated with compliance with 29 CFR 1926.552(c)(1) - 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16)

Paragraph (c)(1) of 29 CFR 1926.552 requires the employers to enclose hoist towers located outside a chimney on the side or sides used for entrance to, and exit from, the chimney. These enclosures must extend the full height of the hoist tower. However, employers, in past proposed variances, have stated that it is impractical and hazardous to locate a hoist tower outside tapered chimneys because it becomes increasingly difficult, as a chimney rises, to erect, guy, and brace a hoist tower. Under these conditions, access from the hoist tower to the chimney or to the movable scaffolds used in constructing the chimney exposes employees to a serious fall hazard. Additionally, they noted that the requirement to extend the enclosures 10 feet above the outside scaffolds often exposes the employees involved in building these extensions to dangerous wind conditions.

Paragraph (c)(2) of 29 CFR 1926.552 requires that employers enclose all four sides of a hoist tower even when the tower is located inside a chimney. The enclosure must extend the full height of the tower. Employers have contended in previous variance requests that it is hazardous for employees to erect and brace a hoist tower inside a chimney, especially small-diameter or tapered chimneys, or chimneys with sublevels, because these structures

have limited space and cannot accommodate hoist towers. Space limitations result from chimney design (e.g., tapering), as well as reinforced steel projecting into the chimney from formwork that is near the work location.

De minimis policy

A review of the previously-granted permanent variances to the requirements of 29 CFR 1926.552(c)(1) through 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16) and 29 CFR 1926.452(o)(3) regarding this chimney work reveals that employers have consistently demonstrated that their proposed alternative conditions to the OSHA requirements protect employees at least as well as the requirements in 29 CFR 1926.452(o)(3) and 29 CFR 1926.552(c)(1) - 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16).

As such, where an employer follows the alternative procedures set forth below in the specified circumstances,² the violations of 29 CFR 1926.452(o)(3) and 29 CFR 1926.552(c)(1)-1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16) will be considered *de minimis*.³

1. Circumstances under which the *de minimis* policy is acceptable

- (a) The chimney is tapered.
- (b) This *de minimis* policy applies only when the employer uses a ~~rope-guided~~ hoist system during inside or outside chimney construction work to raise or lower the employees between the bottom landing of a chimney and an elevated work location on the inside or outside surface of the chimney.
- (c) When using a ~~rope-guided~~ hoist system as specified in this *de minimis* policy, the employer must:
 - (i) Use the personnel cages, personnel platforms, or boatswains' chairs raised and lowered by the ~~rope-guided~~ hoist system solely to transport employees with the tools and materials necessary to do their work; and
 - (ii) Attach a hopper or concrete bucket to the ~~rope-guided~~ hoist system to raise and lower all other materials and tools inside or outside a chimney.
- (d) Except for the requirements specified by §1926.452(o)(3) and §§ 1926.552(c)(1) through 1926.552(c)(4), 1926.552(c)(8), 1926.552(c)(13), 1926.552(c)(14)(i), and 1926.552(c)(16), the employer must comply fully with all other applicable provisions of 29 CFR 1910 and 1926.

2. Replacing a Personnel Cage With a Personnel Platform or a Boatswains' Chair

- (a) *Personnel platform.* When the employer demonstrates that available space makes use of a personnel cage for transporting employees infeasible, it may

² These are based on the circumstances and procedures described in the previously-granted permanent variances referred to earlier.

³ Under OSHA's *de minimis* policy, *de minimis* violations are those which have no direct or immediate relationship to safety and health. Consequently, no citation is issued.

replace the personnel cage with a personnel platform if it limits the use of the personnel platform to elevations above the last work location that the personnel cage can reach.

(b) *Boatswains' chair*. When the employer demonstrates that available space makes a personnel platform for transporting employees infeasible, it may replace the personnel platform with a boatswains' chair if it:

(1) limits the use of the boatswains' chair to elevations above the last work location that the personnel platform can reach; and

(2) uses a boatswains' chair in accordance with the block-and-tackle requirements specified by §1926.452(o)(3), unless it can demonstrate that the structural arrangement of the chimney precludes such use.

3. *Qualified Competent Person*

(a) The employer must:

(i) Provide a qualified competent person, as specified in paragraphs (f) and (m) of §1926.32, who is responsible for ensuring that the design, maintenance, and inspection of the hoist system comply with the conditions of this policy and with the appropriate requirements of 29 CFR 1926 ("Safety and Health Regulations for Construction"); and

(ii) Ensure that the qualified competent person is present at ground level to assist in an emergency whenever the hoist system is raising or lowering employees.

(b) The employer must use a qualified competent person to design and maintain the cathead described under Condition 8 ("Cathead and Sheave") below.

4. *Hoist Machine*

(a) *Type of hoist*. The employer must designate the hoist machine as a portable personnel hoist.

(b) *Raising or lowering a transport*. The employer must ensure that:

(i) The hoist machine includes a base-mounted drum hoist designed to control line speed; and

(ii) Whenever it raises or lowers a personnel or material hoist (e.g., a personnel cage, personnel platform, boatswains' chair, hopper, concrete bucket) using the hoist system:

(A) The drive components are engaged continuously when an empty or occupied transport is being lowered (i.e., no "freewheeling");

(B) The drive system is interconnected, on a continuous basis, through a torque converter, mechanical coupling, or an equivalent coupling (e.g., electronic controller, fluid clutches, hydraulic drives);

(C) The braking mechanism is applied automatically when the transmission is in the neutral position and a forward-reverse coupling or shifting transmission is being used; and

(D) No belts are used between the power source and the winding drum.

(c) *Power source*. The employer must power the hoist machine by an air, electric, hydraulic, or internal-combustion drive mechanism.

- (d) *Constant-pressure control switch*. The employer must:
- (i) Equip the hoist machine with a hand- or foot-operated constant-pressure control switch (*i.e.*, a "deadman control switch") that stops the hoist immediately upon release; and
 - (ii) Protect the control switch to prevent it from activating if the hoist machine is struck by a falling or moving object.
- (e) *Line-speed indicator*. The employer must:
- (i) Equip the hoist machine with an operating line-speed indicator maintained in good working order; and
 - (ii) Ensure that the line-speed indicator is in clear view of the hoist operator during hoisting operations.
- (f) *Braking systems*. The employer must equip the hoist machine with two independent braking systems (*i.e.*, one automatic and one manual) located on the winding side of the clutch or couplings, with each braking system being capable of stopping and holding 150 percent of the maximum rated load.
- (g) *Slack-rope switch*. The employer must equip the hoist machine with a slack-rope switch to prevent rotation of the winding drum under slack-rope conditions.
- (h) *Frame*. The employer must ensure that the frame of the hoist machine is a self-supporting, rigid, welded-steel structure and that holding brackets for anchor lines and legs for anchor bolts are integral components of the frame.
- (i) *Stability*. The employer must secure hoist machines in position to prevent movement, shifting, or dislodgement.
- (j) *Location*. The employer must:
- (i) Locate the hoist machine far enough from the footblock to obtain the correct fleet angle for proper spooling of the cable on the drum; and
 - (ii) Ensure that the fleet angle remains between one-half degree ($1/2^\circ$) and one and one-half degrees ($1-1/2^\circ$) for smooth drums, and between one-half degree ($1/2^\circ$) and two degrees (2°) for grooved drums, with the lead sheave centered on the drum.⁴
- (k) *Drum and flange diameter*. The employer must:
- (i) Provide a winding drum for the hoist that is at least 30 times the diameter of the rope used for hoisting; and
 - (ii) Ensure that the winding drum has a flange diameter that is at least one and one-half ($1-1/2$) times the winding-drum diameter.
- (l) *Spooling of the rope*. The employer must never spool the rope closer than two inches from the outer edge of the winding-drum flange.
- (m) *Electrical system*. The employer must ensure that all electrical equipment is weatherproof.
- (n) *Limit switches*. The employer must equip the hoist system with limit switches and related equipment that automatically prevent overtravel of a personnel cage, personnel platform, boatswains' chair, or material-transport device at the top of the supporting structure and at the bottom of the hoistway or lowest landing level.

⁴ This *de minimis* policy adopts the definition of, and specifications for, fleet angle from *Cranes and Derricks*, H.I. Shapiro, *et al.* (eds.); New York: McGraw-Hill; 3rd ed., 1999, page 592. Accordingly, the fleet angle is "[t]he angle the rope leading onto a [winding] drum makes with the line perpendicular to the drum rotating axis when the lead rope is making a wrap against the flange."

5. *Methods of Operation*

(a) *Employee qualifications and training.* The employer must:

- (i) Ensure that only trained and experienced employees, who are knowledgeable of hoist-system operations, control the hoist machine; and
- (ii) Provide instruction, periodically and as necessary, on how to operate the hoist system to each employee, who uses a personnel cage or personnel platform or boatswains' chair for transportation.

(b) *Speed limitations.* The employer must not operate the hoist at a speed in excess of each of the following:

- (i) 250-feet-per-minute when a personnel cage is being used to transport employees;
- (ii) 100-feet-per-minute when a personnel platform or boatswains' chair is being used to transport employees;
- (iii) A line speed that is consistent with the design limitations of the system when only material is being hoisted.

(c) *Communication.* The employer must:

- (i) Use an electronic voice communication system to maintain communication between the hoist operator and the employees located in or on a moving personnel cage, personnel platform, or boatswains' chair;
- (ii) Stop hoisting if, for any reason, the communication system fails to operate effectively; and
- (iii) Resume hoisting only when the site superintendent determines that it is safe to do so.

6. *Hoist Rope*

(a) *Grade.* The employer must use a wire rope for the hoist system (*i.e.*, "hoist rope") that consists of extra-improved plow steel, an equivalent grade of non-rotating rope, or a regular lay rope with a suitable swivel mechanism.

(b) *Safety factor.* The employer must maintain a safety factor of at least 8 times the safe workload throughout the entire length of hoist rope.

(c) *Size.* The employer must use a hoist rope that is at least one-half (1/2) inch in diameter.

(d) *Inspection, removal, and replacement.* The employer must:

- (i) Thoroughly inspect the hoist rope before the start of each job and on completing a new setup;
- (ii) Maintain the proper diameter-to-diameter ratios between the hoist rope and the footblock and the sheave by inspecting the wire rope regularly (*see* Conditions 7(c) and 8(d) below); and
- (iii) Remove and replace the wire rope with new wire rope when any of the conditions specified by §1926.552(a)(3) occurs.

(e) *Attachments.* The employer must attach the rope to a personnel cage, personnel platform, or boatswains' chair with a keyed-screwpin shackle or positive-locking link.

(f) *Wire-rope fastenings.* When the employer uses clip fastenings (*e.g.*, U-bolt

wire-rope clips) with wire ropes, it must:

- (i) Use Table H-20 of §1926.251 to determine the number and spacing of clips;
- (ii) Use at least three drop-forged clips at each fastening;
- (iii) Install the clips with the "U" of the clips on the dead end of the rope; and
- (iv) Space the clips so that the distance between them is 6 times the diameter of the rope.

7. **Footblock**

(a) *Type of block.* The employer must use a footblock:

- (i) Consisting of construction-type blocks of solid single-piece bail with a safety factor that is at least 4 times the safe workload or an equivalent block with roller bearings;
- (ii) Designed for the applied loading, size, and type of wire rope used for hoisting;
- (iii) Designed with a guard that contains the wire rope within the sheave groove;
- (iv) Bolted rigidly to the base; and
- (v) Designed and installed so that it turns the moving wire rope to and from the horizontal or vertical as required by the direction of rope travel.

(b) *Directional change.* The employer must ensure that the angle of change in the hoist rope from the horizontal to the vertical direction at the footblock is approximately 90°.

(c) *Diameter.* The employer must ensure that the line diameter of the footblock is at least 24 times the diameter of the hoist rope.

8. **Cathead and Sheave**

(a) *Support.* The employer must use a cathead (*i.e.*, "overhead support") that consists of a wide-flange beam or two steel-channel sections securely bolted back-to-back to prevent spreading.

(b) *Installation.* The employer must ensure that:

- (i) All sheaves revolve on shafts that rotate on bearings; and
- (ii) The bearings are mounted securely to maintain the proper bearing position at all times.

(c) *Rope guides.* The employer must provide each sheave with appropriate rope guides to prevent the hoist rope from leaving the sheave grooves when the rope vibrates or swings abnormally.

(d) *Diameter.* The employer must use a sheave with a diameter that is at least 24 times the diameter of the hoist rope.

9. **Guide Ropes**

(a) *Number and construction.* The employer must affix two guide ropes by swivels to the cathead. The guide ropes must:

- (i) Consist of steel safety cables not less than one-half (1/2-) inch in diameter; and
- (ii) Be free of damage or defect at all times.

(b) *Guide rope fastening and alignment tension.* The employer must fasten one

end of each guide rope securely to the overhead support, with appropriate tension applied at the foundation.

(c) *Height*. The employer must rig the guide ropes along the entire height of the hoist-machine structure.

10. *Personnel Cage*

(a) *Construction*. The personnel cage must be of steel-frame construction and capable of supporting a load that is 4 times its maximum rated load capacity. The employer also must ensure that the personnel cage has:

- (i) A top and sides that are permanently enclosed (except for the entrance and exit);
- (ii) A floor securely fastened in place;
- (iii) Walls that consist of 14-gauge, one-half (1/2-) inch expanded metal mesh, or an equivalent material;
- (iv) Walls that cover the full height of the personnel cage between the floor and the overhead covering;
- (v) A sloped roof constructed of one-eighth (1/8-) inch aluminum, or an equivalent material; and
- (vi) Safe handholds (e.g., rope grips -- but not rails or hard protrusions⁵ that accommodate each occupant.

(vii) Attachment points to which employees must secure their personal fall protection systems.

(b) *Overhead weight*. The personnel cage must have an overhead weight (e.g., a headache ball of appropriate weight) to compensate for the weight of the hoist rope between the cathead and footblock. In addition, the employer must:

- (i) Ensure that the overhead weight is capable of preventing line run; and
- (ii) Use a means to restrain the movement of the overhead weight so that the weight does not interfere with safe personnel hoisting.

(c) *Gate*. The personnel cage must have a gate that:

- (i) Guards the full height of the entrance opening; and
- (ii) Has a functioning mechanical lock that prevents accidental opening.

(d) *Operating procedures*. The employer must post the procedures for operating the personnel cage conspicuously at the hoist operator's station.

(e) *Capacity*. The employer must:

- (i) Hoist no more than 4 occupants in the cage at any one time; and
- (ii) Ensure that the rated load capacity of the cage is at least 250 pounds for each occupant so hoisted.

(f) *Employee notification*. The employer must post a sign in each personnel cage notifying employees of the following conditions:

- (i) The standard rated load, as determined by the initial static drop test specified by Condition 10(g) ("Static drop tests") below; and
- (ii) The reduced rated load for the specific job.

(g) *Static drop tests*. The employer must:

- (i) Conduct static drop tests of each personnel cage, and these tests must comply

⁵ To reduce impact hazards should employees lose their balance because of cage movement.

with the definition of "static drop test" specified by section 3 ("Definitions") and the static drop-test procedures provided in section 13 ("Inspections and Tests") of American National Standards Institute (ANSI) standard A10.22-1990 (R1998) ("American National Standard for Rope-Guided and Nonguided Worker's Hoists - Safety Requirements");

(ii) Perform the initial static drop test at 125 percent of the maximum rated load of the personnel cage, and subsequent drop tests at no less than 100 percent of its maximum rated load; and

(iii) Use a personnel cage for raising or lowering employees only when no damage occurred to the components of the cage as a result of the static drop tests.

11. *Safety Clamps*

(a) *Fit to the guide ropes.* The employer must:

(i) Fit appropriately-designed and constructed safety clamps to the guide ropes; and

(ii) Ensure that the safety clamps do not damage the guide ropes when in use.

(b) *Attach to the personnel cage.* The employer must attach safety clamps to each personnel cage for gripping the guide ropes.

(c) *Operation.* The safety clamps attached to the personnel cage must:

(i) Operate on the "broken rope principle" defined in section 3 ("Definitions") of ANSI standard A10.22-1990 (R1998);

(ii) Be capable of stopping and holding a personnel cage that is carrying 100 percent of its maximum rated load and traveling at its maximum allowable speed if the hoist rope breaks at the footblock; and

(iii) Use a pre-determined and pre-set clamping force (*i.e.*, the "spring compression force") for each hoist system.

(d) *Maintenance.* The employer must keep the safety-clamp assemblies clean and functional at all times.

12. *Overhead Protection*

(a) The employer must install a canopy or shield over the top of the personnel cage that is made of steel plate at least three-sixteenth (3/16) of an inch thick, or material of equivalent strength and impact resistance, to protect employees (*i.e.*, both inside and outside the chimney) from material and debris that may fall from above.

(b) The employer must ensure that the canopy or shield slopes to the outside of the personnel cage.⁶

13. *Emergency-Escape Device*

(a) *Location.* The employer must provide an emergency-escape device in at least one of the following locations:

⁶ Paragraphs (a) and (b) were adapted from OSHA's Underground Construction Standard (§1926.800(t)(4)(iv)).

- (i) In the personnel cage, provided that the device is long enough to reach the bottom landing from the highest possible escape point; or
- (ii) At the bottom landing, provided that a means is available in the personnel cage for the occupants to raise the device to the highest possible escape point.
- (b) *Operating instructions.* The employer must ensure that written instructions for operating the emergency-escape device are attached to the device.
- (c) *Training* The employer must instruct each employee who uses a personnel cage for transportation on how to operate the emergency-escape device:
 - (i) Before the employee uses a personnel cage for transportation; and
 - (ii) Periodically, and as necessary, thereafter.

14. Personnel Platforms and Boatswains' Chairs

- (a) *Personnel platforms.* When the employer elects to replace the personnel cage with a personnel platform in accordance with Condition 2(a) of this de minimis policy, it must:
 - (i) Ensure that an enclosure surrounds the platform, and that this enclosure is at least 42 inches above the platform's floor;
 - (ii) Provide overhead protection when an overhead hazard is, or could be, present; and
 - (iii) Comply with the applicable scaffolding strength requirements specified by §1926.451(a)(1).

15. Protecting Employees from Fall and Shearing Hazards

- ~~(b)~~(a) *Fall-protection equipment.* Before employees use personnel cages, personnel work platforms, or boatswains' chairs, the employer must:
 - (i) Equip the employees with, and ensure that they use, full-body harnesses, lanyards and lifelines as specified by §1926.104 and the applicable personal fall-arrest systems that meet the requirements of §1926.502(d);
 - (ii) Ensure that employees using personnel cages secure their fall-arrest systems to attachment points located inside the cage;
 - (iii) Ensure that employees using personnel platforms and boatswains' chairs secure their personal fall-arrest systems to a vertical lifeline; and
 - (iv) When using vertical lifelines:
 - (A) Secure the lifelines to the top of the chimney and to the weight at the bottom of the chimney; and
 - (B) Weight the lifelines properly or suitably affix the lifelines to the bottom of the chimney; and
 - (iii)(C) Ensure the employees' lanyards are remain attached to the their lifeline during the entire period of vertical transit.
- (b) *Shearing hazards.* The employer must:
 - (i) Provide employees who use personnel platforms or boatswains' chairs with instruction on the shearing hazards posed by the hoist system (e.g., work platforms, scaffolds), and the need to keep their limbs or other body parts clear of these hazards during hoisting operations;

- (ii) Provide the instruction on shearing hazards;
- (A) Before an employee uses a personnel platform or boatswains' chair at the worksite; and
- (B) Periodically, and as necessary, thereafter, including whenever an employee demonstrates a lack of knowledge about the hazard or how to avoid it, a modification occurs to an existing shearing hazard, or a new shearing hazard develops at the worksite; and
- (iii) Attach a readily visible warning to each personnel platform and boatswains' chair notifying employees in a language they understand of potential shearing hazards they may encounter during hoisting operations, and that uses the following (or equivalent) wording:
- (A) For personnel platforms: "Warning – To avoid serious injury, keep your hands, arms, feet, legs, and other parts of your body inside this platform while it is moving"; and
- (B) For boatswains' chairs: "Warning – To avoid serious injury, do not extend your hands arms, feet, legs, or other parts of your body from the side or to the front of this chair while it is moving."

16. **Exclusion Zone**

The employer must:

- (a) Establish a clearly designated exclusion zone around the bottom landing of the hoist system; and
- (b) Prohibit any employee from entering the exclusion zone except to access a personnel or material transport device, and then only when the device is at the bottom landing and not in operation (i.e., when the drive components of the hoist machine are disengaged and the braking mechanism is properly applied).

17. **Inspections, Tests, and Accident Prevention**

(a) The employer must:

- (i) Conduct inspections of the hoist system as required by §1926.20(b)(2);
 - (ii) Ensure that a competent person conducts daily visual inspections of the hoist system; and
 - (iii) Inspect and test the hoist system as specified by §1926.552(c)(15).
- (b) The employer must comply with the accident-prevention requirements of §1926.20(b)(3).

18. **Welding**

(a) The employer must ensure that only qualified welders weld components of the hoisting system.

(b) The employer must ensure that the qualified welders:

- (i) Are familiar with the weld grades, types, and materials specified in the design of the system; and

(ii) Perform the welding tasks in accordance with 29 CFR 1926, Subpart J ("Welding and Cutting").

If you need additional information, please contact us by fax at # 202-693-1689. You can also contact us by mail at the U. S. Department of Labor, OSHA Directorate of Construction, Office of Construction Standards and Guidance, Room N3468, 200 Constitution Avenue, N.W., Washington, D.C. 20210, although there will be a delay in our receiving correspondence by mail.

Sincerely,

Edwin G. Foulke, Jr.

NOTE: 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 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. 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>.