

neutralized, brakes set and power shut off. Wheels shall be blocked or curbed if the vehicle is on an incline.

(9) When lift trucks or other mechanically powered vehicles are being operated on open deck-type barges, the edges of the barges shall be guarded by railings, sideboards, timbers, or other means sufficient to prevent vehicles from rolling overboard. When such vehicles are operated on covered lighters where door openings other than those being used are left open, means shall be provided to prevent vehicles from rolling overboard through such openings.

(10) Unauthorized personnel shall not ride on mechanically powered vehicles. A safe place to ride shall be provided when riding is authorized.

(11) An employee may be elevated by fork lift trucks only when a platform is secured to the lifting carriage or forks. The platform shall meet the following requirements:

(i) The platform shall have a railing complying with §1917.112(c) of this chapter.

(ii) The platform shall have toeboards complying with §1917.112(d) of this chapter, if tools or other objects could fall on employees below.

(iii) When the truck has controls elevated with the lifting carriage, means shall be provided for employees on the platform to shut off power to the vehicle.

(iv) Employees on the platform shall be protected from exposure to moving truck parts.

(v) The platform floor shall be skid resistant.

(vi) An employee shall be at the truck's controls whenever employees are elevated.

(vii) While an employee is elevated, the truck may be moved only to make minor adjustments in placement.

[62 FR 40202, July 25, 1997, as amended at 65 FR 40945, June 30, 2000]

§ 1918.66 Cranes and derricks other than vessel's gear.

(a) *General.* The following requirements shall apply to the use of cranes and derricks brought aboard vessels for conducting longshoring operations. They shall not apply to cranes and derricks forming part of a vessel's permanent equipment.

(1) *Certification.* Cranes and derricks shall be certificated in accordance with part 1919 of this chapter.

(2) *Posted weight.* The crane weight shall be posted on all cranes hoisted aboard vessels for temporary use.

(3) *Rating chart.* All cranes and derricks having ratings that vary with boom length, radius (outrreach) or other variables shall have a durable rating chart visible to the operator, covering the complete range of the manufacturers' (or design) capacity ratings. The rating chart shall include all operating radii (outrreach) for all permissible boom lengths and jib lengths, as applicable, with and without outriggers, and alternate ratings for optional equipment affecting such ratings. Precautions or warnings specified by the owner or manufacturer shall be included along with the chart.

(4) *Rated loads.* The manufacturers' (or design) rated loads for the conditions of use shall not be exceeded.

(5) *Change of rated loads.* Designated working loads shall not be increased beyond the manufacturers' ratings or original design limitations unless such increase receives the manufacturers' approval. When the manufacturers' services are not available or where the equipment is of foreign manufacture, engineering design analysis shall be done or approved by a person accredited for certificating the equipment under part 1919 of this chapter. Engineering design analysis shall be done by a registered professional engineer competent in the field of cranes and derricks. Any structural changes required by the change in rating shall be carried out.

(6) *Radius indicator.* When the rated load varies with the boom radius, the crane or derrick shall be fitted with a boom angle or radius indicator visible to the operator.

(7) *Operator's station.* The cab, controls and mechanism of the equipment shall be so arranged that the operator has a clear view of the load or signalman, when one is used. Cab glass, when used, shall be safety plate glass or equivalent. Cranes with missing, broken, cracked, scratched, or dirty glass (or equivalent), that impairs operator vision shall not be used. Clothing, tools, and equipment shall be stored so

as not to interfere with access, operation, and the operator's view.

(8) *Counterweights or ballast.* Cranes shall be operated only with the specified type and amount of ballast or counterweights. Ballast or counterweights shall be located and secured only as provided in the manufacturers' or design specifications, which shall be available for inspection.

(9) *Outriggers.* Outriggers shall be used according to the manufacturers' specifications or design data, which shall be available for inspection. Floats, when used, shall be securely attached to the outriggers. Wood blocks or other support shall be of sufficient size to support the outrigger, free of defects that may affect safety, and of sufficient width and length to prevent the crane from shifting or toppling under load.

(10) *Exhaust gases.* Engine exhaust gases shall be discharged away from crane operating personnel.

(11) *Electrical/Guarding.* Electrical equipment shall be so placed or enclosed that live parts will not be exposed to accidental contact. Designated persons may work on energized equipment only if necessary during inspection, maintenance, or repair; otherwise the equipment shall be stopped and its power source locked out and tagged out.

(12) *Fire extinguisher.* (i) At least one portable approved or listed fire extinguisher of at least a 5-B:C rating or equivalent shall be accessible in the cab of the crane or derrick.

(ii) No portable fire extinguisher using carbon tetrachloride or chlorobromomethane extinguishing agents shall be used.

(13) *Rope on drums.* At least three full turns of rope shall remain on ungrooved drums, and two turns on grooved drums, under all operating conditions. Wire rope shall be secured to drums by clamps, U-bolts, shackles or equivalent means. Fiber rope fastenings are prohibited.

(14) *Brakes.* (i) Each independent hoisting unit of a crane shall be equipped with at least one holding brake, applied directly to the motor shaft or gear train.

(ii) Each independent hoisting unit of a crane shall, in addition to the hold-

ing brake, be equipped with a controlled braking means to control lowering speeds.

(iii) Holding brakes for hoist units shall have not less than the following percentage of the rated load hoisting torque at the point where the brake is applied:

(A) 125 percent when used with an other than mechanically controlled braking means;

(B) 100 percent when used with a mechanically controlled braking means; or

(C) 100 percent when two holding brakes are provided.

(iv) All power control braking means shall be capable of maintaining safe lowering speeds of rated loads.

(15) *Operating controls.* Crane and derrick operating controls shall be clearly marked, or a chart showing their function shall be posted at the operator's position.

(16) *Booms.* Cranes with elevatable booms and without operable automatic limiting devices shall be provided with boom stops if boom elevation can exceed maximum design angles from the horizontal.

(17) *Foot pedals.* Foot pedals shall have a non-skid surface.

(18) *Access.* Ladders, stairways, stanchions, grab irons, foot steps or equivalent means shall be provided as necessary to ensure safe access to footwalks, cab platforms, the cab and any portion of the superstructure that employees must reach.

(b) *Operations—(1) Use of cranes together.* When two or more cranes hoist a load in unison, a designated person shall direct the operation and instruct personnel in positioning, rigging of the load and movements to be made.

(2) *Guarding of swing radius.* Accessible areas within the swing radius of the body of a revolving crane shall be physically guarded during operations to prevent an employee from being caught between the body of the crane and any fixed structure or between parts of the crane.

(3) *Prohibited usage.* (i) Equipment shall not be used in a way that exerts side loading stresses upon the crane or derrick boom.

(ii) No crane or derrick having a visible or known defect that may affect safe operation shall be used.

(4) *Unattended cranes.* The following steps shall be taken before leaving a crane unattended between work periods:

(i) Suspended loads, such as those hoisted by lifting magnets or clamshell buckets, shall be landed unless the storage position or maximum hoisting of the suspended device will provide equivalent safety;

(ii) Clutches shall be disengaged;

(iii) The power supply shall be shut off;

(iv) The crane shall be secured against accidental travel; and

(v) The boom shall be lowered or secured against movement.

(c) *Protection for employees being hoisted.* (1) No employee shall be hoisted by the load hoisting apparatus of a crane or derrick except on a platform meeting the following requirements:

(i) Enclosed by a railing or other means providing protection equivalent to that described in §1917.112(c) of this chapter;

(ii) Fitted with toe boards if the platform has open railings;

(iii) A safety factor of four based on ultimate strength;

(iv) Bearing a plate or permanent marking indicating maximum load rating, which shall not be exceeded, and the weight of the platform itself;

(v) Equipped with a device to prevent access doors, when used, from opening accidentally;

(vi) Equipped with overhead protection for employees on the platform if they are exposed to falling objects or overhead hazards; and

(vii) Secured to the load line by means other than wedge and socket attachments, unless the free (bitter) end of the line is secured back to itself by a clamp placed as close above the wedge as possible.

(2) Except in an emergency, the hoisting mechanism of all cranes or derricks used to hoist personnel shall operate only in power up and power down, with automatic brake application when not hoisting or lowering.

(3) All cranes and derricks used to hoist personnel shall be equipped with an anti-two-blocking device.

(4) Variable radius booms of a crane or derrick used to hoist personnel shall be so constructed or secured as to prevent accidental boom movement.

(5) Platforms or devices used to hoist employees shall be inspected for defects before each day's use and shall be removed from service if defective.

(6) Employees being hoisted shall remain in continuous sight of and communication with the operator or signalman.

(7) Operators shall remain at the controls when employees are hoisted.

(8) Cranes shall not travel while employees are hoisted, except in emergencies or in normal tier-to-tier transfer of employees during container operations.

(d) *Routine inspection.* (1) Designated persons shall visually inspect each crane and derrick on each day of use for defects in functional operating components and shall report any defect found to the employer. The employer shall inform the operator of the result of the inspection.

(2) A designated person shall thoroughly inspect all functional components and accessible structural features of each crane or device at monthly intervals.

(3) Any defects found during such inspections that may create a safety hazard shall be corrected before further equipment use. Repairs shall be done only by designated persons.

(4) A record of each monthly inspection shall be maintained for six months in or on the crane or derrick or at the terminal.

(e) *Protective devices.* (1) When exposed moving parts such as gears, chains and chain sprockets present a hazard to employees during crane and derrick operations, those parts shall be securely guarded.

(2) Crane hooks shall be latched or otherwise secured to prevent accidental load disengagement.

(f) *Load-indicating devices.* (1) Unless exempted by the provisions of paragraph (f)(1)(viii) of this section, every crane used to load or discharge cargo into or out of a vessel shall be fitted with a load-indicating device or alternative device in proper working condition that shall meet the following criteria:

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(i) The type or model of any load-indicating device used shall be such as to provide:

(A) A direct indication in the cab of actual weight hoisted or a means of determining this by reference to crane ratings posted and visible to the operator, except that the use of a dynamometer or simple scale alone will not meet this requirement; or

(B) An automatic weight-moment device (e.g., a computer) providing indications in the cab according to the radius and load at the moment; or

(C) A device that will prevent an overloaded condition.

(ii) The accuracy of the load-indicating device, weight-moment device, or overload protection device shall be such that any indicated load (or limit), including the sum of actual weight hoisted and additional equipment or "add ons" such as slings, sensors, blocks, etc., is within the range between 95 percent (5 percent underload) and 110 percent (10 percent overload) of the actual true total load. Such accuracy shall be required over the range of daily operating variables reasonably anticipated under the conditions of use.

(iii) The device shall enable the operator to decide before making any lift that the load indicating device or alternative device is operative. In the alternative, if the device is not so mounted or attached and does not include such means of checking, it shall be certified by the manufacturer to remain operative for a specific time. The device shall be checked for accuracy, using known values of the load, at the time of every certification survey (see §1918.11) and at such additional times as may be recommended by the manufacturer.

(iv) When the load indicating device or alternative device is so arranged in the supporting system (crane structure) that its failure could cause the load to be dropped, its strength shall not be the limiting factor of the supporting system (crane structure).

(v) Units of measure in pounds or both pounds and kilograms (or other indicators of measurement, such as colored indicator lights), capacity of the indicating system, accuracy of the indicating system, and operating instruc-

tions and precautions shall be conspicuously marked. If the system used provides no readout but automatically ceases crane operation when the rated load limit is reached under any specific condition of use, the marking shall provide the make and model of the device installed, a description of what it does, how it is operated, and any necessary precautions regarding the system. All of these markings shall be readily visible to the operator.

(vi) All load indicating devices shall operate over the full operating radius. Overall accuracy shall be based on actual applied loads and not on full scale (full capacity) load.

NOTE TO PARAGRAPH (f)(1)(vi): If the accuracy of the load indicating device is based on full scale loads and the device is arbitrarily set at plus or minus 10 percent, it would accept a reading between 90,000 and 110,000 lbs. at full capacity for a machine with a maximum rating of 100,000 lbs. but would also show a reading of between zero and 20,000 lbs. at that outreach (radius) at which the load would be 10,000 lbs.; this is clearly unacceptable. If, however, the accuracy of the device is based on actual applied loads under the same conditions, the acceptable range would remain the same with the 100,000-lb. load but would show a figure between 9,000 and 11,000 lbs. at the 10,000-lb. load; this is an acceptable reading.

(vii) When a load-indicating device uses the radius as a factor in its use or in its operating indications, the indicated radius (which may be in feet and/or meters, or degrees of boom angle, depending on the system used) shall be within the range between 97 percent and 110 percent of the actual (true) radius. When radius is presented in degrees, and feet or meters are required for necessary determinations, a conversion chart shall be provided.

(viii) The load indicating device requirements of this paragraph do not apply to a crane:

(A) Of the trolley equipped bridge type while handling containers known to be and identified as empty, or loaded, and in either case according to the provisions of §1918.85(b) of this part, or while hoisting other lifts by means of a lifting beam supplied by the crane manufacturer for the purpose and in all cases within the crane rating;

(B) While handling bulk commodities or cargoes by means of clamshell bucket or magnet;

(C) While used to handle or hold hoses in connection with transfer of bulk liquids, or other hose-handled products; or

(D) While the crane is used exclusively to handle cargo or equipment whose total actual gross weight is marked on the unit or units hoisted, and the total actual gross weight never exceeds 11,200 lbs., and the load is less than the rated capacity of the crane at the maximum outreach possible at the time.

(2) [Reserved]

[62 FR 40202, July 25, 1997, as amended at 65 FR 40945, June 30, 2000]

§ 1918.67 Notifying the ship's officers before using certain equipment.

(a) The employer shall notify the officer in charge of the vessel before bringing aboard ship internal combustion or electric powered tools, equipment or vehicles.

(b) The employer shall also notify the officer in charge of the vessel before using the ship's electric power for the operation of any electric tools or equipment.

§ 1918.68 Grounding.

The frames of portable electrical equipment and tools, other than double insulated tools and battery operated tools, shall be grounded through a separate equipment conductor run with or enclosing the circuit conductors.

§ 1918.69 Tools.

(a) *General.* Employers shall not issue or permit the use of visibly unsafe tools.

(b) *Portable electric tools.* (1) Portable hand-held electric tools shall be equipped with switches of a type that must be manually held in a closed position in order to operate the tool.

(2) All portable, power-driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except

for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.

[62 FR 40202, July 25, 1997, as amended at 65 FR 40946, June 30, 2000]

§§ 1918.70–1918.80 [Reserved]

Subpart H—Handling Cargo

§ 1918.81 Slinging.

(a) Drafts shall be safely slung before being hoisted. Loose dunnage or debris hanging or protruding from loads shall be removed.

(b) Cargo handling bridles, such as pallet bridles, which are to remain attached to the hoisting gear while hoisting successive drafts, shall be attached by shackles, or other positive means shall be taken to prevent them from being accidentally disengaged from the cargo hook.

(c) Drafts of lumber, pipe, dunnage and other pieces, the top layer of which is not bound by the sling, shall be slung in a way that prevents sliders. Double slings shall be used on unstrapped dunnage, unless, due to the size of hatch or deep tank openings, using them is impracticable.

(d) Case hooks shall be used only with cases designed to be hoisted by these hooks.

(e) Bales of cotton, wool, cork, wood pulp, gunny bags or similar articles shall not be hoisted by straps unless the straps are strong enough to support the weight of the bale. At least two hooks, each in a separate strap, shall be used.

(f) Unitized loads bound by bands or straps may be hoisted by the banding or strapping only if the banding or strapping is suitable for hoisting and is strong enough to support the weight of the load.

(g) Additional means to maintain the unitized loads during hoisting shall be employed to ensure safe lifting of such loads having damaged banding or strapping.

(h) Loads requiring continuous manual guidance during handling shall be guided by guide ropes (tag lines) that are long enough to control the load.