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line against coamings and obstructions.

(c) Snatch blocks shall not be used with the point of the hook resting on the flange of a beam, but shall be hung from padeyes, straps, or beam clamps. Snatch blocks or straps shall not be made fast to batten cleats or other insecure fittings.

(d) Beam frame clamps shall be so secured as to prevent their slipping, falling, or being pulled from their stationary attachment.

(e) Falls led from cargo booms of vessels shall not be used to move scows, lighters or railcars.

§ 1918.85 Containerized cargo operations.

(a) *Container markings.* Every intermodal container shall be legibly and permanently marked with:

(1) The weight of the container when empty, in pounds;

(2) The maximum cargo weight the container is designed to carry, in pounds; and

(3) The sum of the weight of the container and the maximum cargo weight, in pounds.

(b) *Container weight.* No container shall be hoisted by any lifting appliance unless the following conditions have been met:

(1) The employer shall determine from the carrier whether a container to be hoisted is loaded or empty. Before loading or discharging, empty containers shall be identified in a manner that will inform every supervisor and job boss on the site and in charge of loading or discharging, or every crane or other hoisting equipment operator and signalman, that such container is empty. Methods of identification may include cargo plans, manifests, or markings on the container.

(2) For a loaded container:

(i) The actual gross weight shall be plainly marked and visible to the crane or other hoisting equipment operator or signalman, or to every supervisor or job boss on site and in charge of the operation; or

(ii) The cargo stowage plan or equivalent permanently recorded display serving the same purpose, containing the actual gross weight and the serial number or other positive identification

of that specific container, shall be provided to the crane or other hoisting equipment operator and signalman, and to every supervisor and job boss on site and in charge of the operation.

(3) Every outbound container received at a marine terminal ready to load aboard a vessel without further consolidation or loading shall be weighed to obtain the actual gross weight, either at the terminal or elsewhere, before being hoisted.

(4)(i) When container weighing scales are found at a marine terminal, any outbound container with a load consolidated at that terminal shall be weighed to obtain the actual weight before being hoisted.

(ii) If the terminal has no scales, the actual gross weight may be calculated from the container's contents and the container's empty weight. The weights used in the calculation shall be posted conspicuously on the container, with the name of the person making the calculation, and the date.

(5) Open top vehicle-carrying containers, and those built specifically and used solely for the carriage of compressed gases, are excepted from paragraphs (b)(3) and (b)(4) of this section.

(6) Closed dry van containers carrying vehicles are exempted from paragraph (b)(4) of this section if:

(i) The container carries only completely assembled vehicles and no other cargo;

(ii) The container is marked on the outside so that an employee can readily discern that the container is carrying vehicles; and

(iii) The vehicles were loaded into the container at the marine terminal.

(7) The weight of loaded inbound containers from foreign ports shall be determined by weighing, by the method of calculation described in paragraph (b)(4)(ii) of this section or by shipping documents.

(8) Any scale used within the United States to weigh containers for the requirements of this section shall meet the accuracy standards of the state or local public authority in which the scale is found.

(c) *Overloaded containers.* No container shall be hoisted if its actual gross weight exceeds the weight marked as required in paragraph (a)(3)

of this section, or it exceeds the capacity of the lifting appliance.

(d) *Container inspection.* (1) Prior to hoisting, each container shall be inspected for any visible defects in structural members and fittings that would make the handling of such container unsafe.

(2) Any container found to have such a defect shall either be handled by a special means to ensure safe handling or shall be emptied before handling.

(e) *Suspended containers.* The employer shall prohibit employees from working beneath a suspended container.

(f) *Lifting fittings.* Containers shall be handled using lifting fittings or other arrangements suitable and intended for the purpose as set forth in paragraphs (f)(1) and (f)(2) of this section, unless damage to an intermodal container makes special means of handling necessary.

(1) *Loaded intermodal containers.* Loaded intermodal containers of 20 feet (6.1 m) or more shall be hoisted as follows:

(i) When hoisting containers by the top fittings, the lifting forces shall be applied vertically from at least four such fittings. A less than vertical lift is permitted only under the following conditions:

(A) The container being lifted is an ISO "closed box container";

(B) The condition of the box is sound;

(C) The speed of hoisting and lowering is moderated when heavily laden containers⁵ are encountered;

(D) The lift angle is at 80 to 90 degrees;

(E) The distance between the lifting beam and the load is at least 8 feet, 2.4 inches (2.5 m); and

(F) The length of the spreader beam is at least 16.3 feet (5 m) for a 20-foot container, and at least 36.4 feet (11.1 m) for a 40-foot container.

(ii) When hoisting containers from bottom fittings, the hoisting connections shall bear on the fittings only, making no other contact with the container. The angles of the four bridle legs shall not be less than 30 degrees to

⁵ A heavily laden container is one that is loaded to within 20 percent of its rated capacity.

the horizontal for 40-foot (12.19 m) containers; 37 degrees for 30-foot (9.14 m) containers; and 45 degrees for 20-foot (6.1 m) containers.

(iii) Lifting containers by fork lift trucks or grappling arms from above or from one side may be done only if the container is designed for this type of handling.

(iv) Other means of hoisting may be used only if the containers and hoisting means are designed for such use.

(2) *Intermodal container spreaders.* (i) When using intermodal container spreaders that employ lanyards for activation and load disengagement, all possible precautions shall be taken to prevent accidental release of the load.

(ii) Intermodal container spreaders that utilize automatic twist lock systems shall be designed and used so that a suspended load cannot accidentally be released.

(g) *Safe container top access.* A safe means of access shall be provided for each employee required to work on the top of an intermodal container. Unless ladders are used for access, such means shall comply with the requirements of § 1917.45(j) of this chapter.

(h) *Employee hoisting prohibition.* Employees shall not be hoisted on intermodal container spreaders while a load is engaged.

(i) *Portable ladder access.* When other safer means are available, portable ladders shall not be used in gaining access to container stacks more than two containers high.

(j) *Fall protection—(1) Containers being handled by container gantry cranes.* (i) After July 26, 1999, where a container gantry crane is being used to handle containers, the employer shall ensure that no employee is on top of a container. Exception: An employee may be on top of a container only to perform a necessary function that cannot be eliminated by the use of positive container securing devices.⁶

⁶ Examples of work that may not be eliminated by positive container securing devices and that may require employees to work on top of containers include, but are not limited to: installing or removing bridge clamps; hooking up or detaching over-height containers; or freeing a jammed semi-automatic twist lock.

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(ii) After July 26, 1999, the employer shall ensure that positive container securing devices, such as semi-automatic twist locks and above deck cell guides, are used wherever container gantry cranes are used to hoist containers.

(iii) The employer shall ensure that each employee on top of a container is protected from fall hazards by a fall protection system meeting the requirements of paragraph (k) of this section.

(2) *Containers being handled by other hoisting devices.* Where containers are being handled by hoisting devices other than container gantry cranes, the employer shall ensure that each employee on top of a container is protected by a fall protection system meeting the requirements of paragraph (k) of this section.

(3) *Other exposure to fall hazards.* The employer shall ensure that each employee exposed to a fall hazard is protected by a fall protection system meeting the requirements of paragraph (k) of this section. Exception: Where the employer can demonstrate that fall protection for an employee would be infeasible or create a greater hazard due to vessel design, container design, container storage, other cargo stowage, container handling equipment, lifting gear, or port conditions, the employer shall alert the affected employee about the fall hazard and instruct the employee in ways to minimize exposure to that hazard.

(k) *Fall protection systems.* When fall protection systems required by paragraph (j) of this section are employed, the following shall apply:

(1) Each fall protection system component, except anchorages, shall have fall arrest/restraint as its only use.

(2) Each fall protection system subjected to impact loading shall be immediately withdrawn from service and not be used again until inspected and determined by a designated person to be undamaged and suitable for use.

(3) Each fall protection system shall be rigged so that a falling employee cannot contact any lower level stowage or vessel structure.

(4) Each fall protection system adopted for use shall have an energy absorbing mechanism that will produce an arresting force on an employee of not greater than 1800 pounds (8 kN).

(5) Each component of a fall protection system shall be designed and used to prevent accidental disengagement.

(6) Each fall protection system's fixed anchorages shall be capable of sustaining a force of 5,000 pounds (22.2 kN) or be certified as capable of sustaining at least twice the potential impact load of an employee's fall. Such certification must be made by a qualified person.⁷ When more than one employee is attached to an anchorage, these limits shall be multiplied by the number of employees attached.

(7) When "live" (activated) container gantry crane lifting beams or attached devices are used as anchorage points, the following requirements apply:

(i) The crane shall be placed into a "slow" speed mode;

(ii) The crane shall be equipped with a remote shut-off switch that can stop trolley, gantry, and hoist functions and that is in the control of the employee(s) attached to the beam; and

(iii) A visible or audible indicator shall be present to alert the exposed employee(s) when the remote shut-off is operational.

(8) Fall protection system components, other than the anchorages, shall be certified as a unit of being capable of sustaining at least twice the potential impact load of an employee's fall. Such certification shall be made by a qualified person.⁸

(9) Each fall protection system shall incorporate the use of a full body harness.

(10) Each device, such as a safety cage, used to transport an employee(s) by being attached to a container gantry crane spreader, shall have a secondary means to prevent accidental disengagement and the secondary means shall be engaged.

⁷For the purposes of this paragraph, qualified person means one with a recognized degree or professional certificate and extensive knowledge and experience in the subject field who is capable of design, analysis, evaluation and specifications in the subject work, project, or product.

⁸For the purposes of this paragraph, qualified person means one with a recognized degree or professional certificate and extensive knowledge and experience in the subject field who is capable of design, analysis, evaluation and specifications in the subject work, project, or product.

(11) Each fall protection system shall be inspected before each day's use by a designated person. Any defective components shall be removed from service.

(12) Before using any fall protection system, the employee shall be trained in the use and application limits of the equipment, proper hookup, anchoring and tie-off techniques, methods of use, and proper methods of equipment inspection and storage.

(13) The employer shall establish and implement a procedure to retrieve personnel safely in case of a fall.

(l) *Working along unguarded edges.* The employer shall provide, and ensure that the employee use, fall protection meeting the requirements of paragraph (k) of this section whenever the employee works along an unguarded edge where a fall hazard exists (see § 1918.2).

(m) *Vertical tandem lifts.* Operations involving the lifting of two or more intermodal containers by the top container shall be performed following § 1917.71(i) and (k)(1) of this chapter.

[62 FR 40202, July 25, 1997, as amended at 65 FR 40946, June 30, 2000; 73 FR 75290, Dec. 10, 2008]

§ 1918.86 Roll-on roll-off (Ro-Ro) operations (see also § 1918.2, Ro-Ro operations, and § 1918.25).

(a) *Traffic control system.* An organized system of vehicular and pedestrian traffic control shall be established and maintained at each entrance/exit ramp and on ramps within the vessel as traffic flow warrants.

(b) *Ramp load limit.* Each ramp shall be plainly marked with its load capacity. The marked capacity shall not be exceeded.

(c) *Pedestrian traffic.* Bow, stern, and side port ramps also used for pedestrian access shall meet the requirements of § 1918.25. Such ramps shall provide a physical separation between pedestrian and vehicular routes. When the design of the ramp prevents physical separation, a positive means shall be established to prevent simultaneous use of the ramp by vehicles and pedestrians.

(d) *Ramp maintenance.* Ramps shall be properly well maintained and secured.

(e) *Hazardous routes.* Before the start of Ro-Ro operations, the employer shall identify any hazardous routes or areas that could be mistaken for normal drive-on/drive-off routes. Such hazardous routes shall be clearly marked and barricaded.

(f) *Air brake connections.* Each tractor shall have all air lines connected when pulling trailers equipped with air brakes and shall have the brakes tested before commencing operations.

(g) *Trailer load limits.* After July 27, 1998, flat bed and low boy trailers shall be marked with their cargo capacities and shall not be overloaded.

(h) *Cargo weights.* Cargo to be handled via a Ro-Ro ramp shall be plainly marked with its weight in pounds (kilograms). Alternatively, the cargo stow plan or equivalent record containing the actual gross weight of the load may be used to determine the weight of the cargo.

(i) *Tractors.* Tractors used in Ro-Ro operations shall have:

(1) Sufficient power to ascend ramp inclines safely; and

(2) Sufficient braking capacity to descend ramp inclines safely.

(j) *Safe speeds.* Power driven vehicles used in Ro-Ro operations shall be operated at speeds that are safe for prevailing conditions.

(k) *Ventilation.* Internal combustion engine-driven vehicles shall be operated only where adequate ventilation exists or is provided. (Air contaminant requirements are found in § 1918.94 and part 1910, subpart Z, of this chapter.)

(l) *Securing cargo.* Cargo loaded or discharged during Ro-Ro operations shall be secured to prevent sliding loads.

(m) *Authorized personnel.* Only authorized persons shall be permitted on any deck while loading or discharging operations are being conducted. Such authorized persons shall be equipped with high visibility vests (or equivalent protection¹⁰).

NOTE TO PARAGRAPH (m): High visibility vests or equivalent protection means high visibility/retro-reflective materials which are intended to make the user clearly visible by day through the use of high visibility (fluorescent) material and in the dark by vehicle

¹⁰Decals on hard hats will not be considered equivalent protection for the purposes of this paragraph.

⁹[Reserved]