

(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.<sup>7</sup> 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.<sup>8</sup>

(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.

(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.

(1) *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).

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

**§ 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 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

<sup>9</sup>[Reserved]

<sup>7</sup>For 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.

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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 protection<sup>10</sup>).

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 headlights through the use of retro-reflective material. For example, an acceptable area of material for a vest or equivalent protection is .5 m<sup>2</sup> (760 in.<sup>2</sup>) for fluorescent (background) material and .13m<sup>2</sup> (197 in.<sup>2</sup>) for retro-reflective material. Vests or equivalent protection, such as high visibility/retro-reflective coveralls, that are available for industrial use, may also be acceptable.

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

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(n) *Vehicle stowage positioning.* Drivers shall not drive vehicles, either forward or backward, while any personnel are in positions where they could be struck.

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

### § 1918.87 Ship's cargo elevators.

(a) *Safe working load.* The safe working loads of ship's cargo elevators shall be determined and followed.

(b) *Load distribution.* Loads shall be evenly distributed and maintained on the elevator's platform.

(c) *Elevator personnel restrictions.* Personnel shall not be permitted to ride on the elevator's platform if a fall hazard exists. (See §1918.2.)

(d) *Open deck barricades.* During elevator operation, each open deck that presents a fall hazard to employees shall be effectively barricaded.

### § 1918.88 Log operations.

(a) *Working in holds.* When loading logs into the holds of vessels and using dumper devices to roll logs into the wings, the employer shall ensure that employees remain clear of areas where logs being dumped could strike, roll upon, or pin them.

(b) *Personal flotation devices.* Each employee working on a log boom shall be protected by a personal flotation device meeting the requirements of §1918.105(b)(2).

(c) *Footwear.* The employer shall provide each employee that is working logs with appropriate footwear, such as spiked shoes or caulked sandals, and shall ensure that each employee wears appropriate footwear to climb or walk on logs.

(d) *Lifelines.* When employees are working on log booms or cribs, lifelines shall be furnished and hung overside to the water's edge.

(e) *Jacob's ladder.* When a log boom is being worked, a Jacob's ladder meeting the requirements of §1918.23 shall be provided for each gang working alongside unless other safe means of access (such as the vessel's gangway) is provided. However, no more than two Jacob's ladders are required for any single log boom being worked.

(f) *Life-ring.* When working a log boom alongside a ship, a U.S. Coast