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the force and deceleration distance measured.)

(3) Failure. A system fails the force test if the recorded maximum arresting force exceeds 1,260 pounds (5.6 Kn) when using a body belt, or exceeds 2,520 pounds (11.21 Kn) when using a body harness.

(4) Distances. The maximum elongation and deceleration distance should be recorded during the force test.

(d) *Deceleration device tests—general.* The device should be evaluated or tested under the environmental conditions (such as rain, ice, grease, dirt, type of lifeline, etc.) for which the device is designed.

(1) Rope-grab-type deceleration devices. (i) Devices should be moved on a lifeline 1,000 times over the same length of line a distance of not less than 1 foot (30.48 cm), and the mechanism should lock each time.

(ii) Unless the device is permanently marked to indicate the type of lifelines which must be used, several types (different diameters and different materials) of lifelines should be used to test the device.

(2) Other-self-activating-type deceleration devices. The locking mechanisms of other self-activating-type deceleration devices designed for more than one arrest should lock each of 1,000 times as they would in normal service.

2. *Positioning device systems—(a) Test Conditions.* (1) The fixed anchorage should be rigid and should not have a deflection greater than .04 inches (1.02 mm) when a force of 2,250 pounds (10.01 Kn) is applied.

(2) For lineman's body belts and pole straps, the body belt should be secured to a 250 pound (113.4 kg) bag of sand at a point which simulates the waist of an employee. One end of the pole strap should be attached to the rigid anchorage and the other end to the body belt. The sand bag should be allowed to free fall a distance of 4 feet (1.22 m). Failure of the pole strap and body belt should be indicated by any breakage or slippage sufficient to permit the bag to fall free to the ground.

(3) For window cleaner's belts, the complete belt should withstand a drop test consisting of a 250 pound (113.4 kg) weight falling free for a distance of 6 feet (1.83 m). The weight should be a rigid object with a girth of 38 inches plus or minus four inches (96.52 cm plus or minus 10.16 cm.) The weight should be placed in the waistband with the belt buckle drawn firmly against the weight, as when the belt is worn by a window cleaner. One belt terminal should be attached to a rigid anchor and the other terminal should hang free. The terminals should be adjusted to their maximum span. The weight fastened in the freely suspended belt should then be lifted exactly 6 feet (1.83 m) above its "at rest" position and released so as to permit a free fall of 6 feet (1.83 m) vertically below the point of attachment of the terminal anchor.

The belt system should be equipped with devices and instrumentation capable of measuring the duration and magnitude of the arrest forces. Any breakage or slippage which permits the weight to fall free of the system constitutes failure of the test. In addition, the initial and subsequent arresting force peaks should be measured and should not exceed 2,000 pounds (8.9 Kn) for more than 2 milliseconds for the initial impact, nor exceed 1,000 pounds (4.45 Kn) for the remainder of the arrest time.

(4) All other positioning device systems (except for restraint line systems) should withstand a drop test consisting of a 250-pound (113.4 kg) weight falling free for a distance of 4 feet (1.22 m). The weight should be a rigid object with a girth of 38 inches plus or minus 4 inches (96.52 cm plus or minus 10.16 cm). The body belt or harness should be affixed to the test weight as it would be to an employee. The system should be connected to the rigid anchor in the manner that the system would be connected in normal use. The weight should be lifted exactly 4 feet (1.22 m) above its "at rest" position and released so as to permit a vertical free fall of 4 feet (1.22 m). Any breakage or slippage which permits the weight to fall free to the ground should constitute failure of the system.

[47 FR 16986, Apr. 20, 1982, as amended at 67 FR 44544, July 3, 2002]

Subpart J—Ship's Machinery and Piping Systems

§ 1915.161 Scope and application of subpart.

The standards contained in this subpart shall apply to ship repairing and shipbuilding and shall not apply to shipbreaking.

§ 1915.162 Ship's boilers.

(a) Before work is performed in the fire, steam, or water spaces of a boiler where employees may be subject to injury from the direct escape of a high temperature medium such as steam, or water, oil, or other medium at a high temperature entering from an interconnecting system, the employer shall insure that the following steps are taken:

(1) The isolation and shutoff valves connecting the dead boiler with the live system or systems shall be secured, blanked, and then locked or tagged, in accordance with § 1915.89, indicating that employees are working on the boiler. This lock or tag shall not

be removed nor the valves unblanked until it is determined that this may be done without creating a hazard to the employees working on the boiler, or until the work on the boiler is completed, in accordance with §1915.89. When valves are welded instead of bolted, at least two isolation and shutoff valves connecting the dead boiler with the live system or systems shall be secured, and then locked or tagged, in accordance with §1915.89.

(2) Drain connections to atmosphere on all of the dead interconnecting systems shall be opened for visual observation of drainage.

(3) A warning sign calling attention to the fact that employees are working in the boilers shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are out of the boilers.

[47 FR 16986, Apr. 20, 1982, as amended at 76 FR 24711, May 2, 2011]

§ 1915.163 Ship's piping systems.

(a) Before work is performed on a valve, fitting, or section of piping in a piping system where employees may be subject to injury from the direct escape of steam, or water, oil, or other medium at a high temperature, the employer shall insure that the following steps are taken:

(1) The isolation and shutoff valves connecting the dead system with the live system or systems shall be secured, blanked, and then locked or tagged, in accordance with §1915.89, indicating that employees are working on the systems. The lock or tag shall not be removed or the valves unblanked until it is determined that this may be done without creating a hazard to the employees working on the system, or until the work on the system is completed, in accordance with §1915.89. When valves are welded instead of bolted, at least two isolation and shutoff valves connecting the dead system with the live system or systems shall be secured, and then locked or tagged, in accordance with §1915.89.

(2) Drain connections to the atmosphere on all of the dead inter-

connecting systems shall be opened for visual observation of drainage.

[47 FR 16986, Apr. 20, 1982, as amended at 67 FR 44545, July 3, 2002; 76 FR 24711, May 2, 2011]

§ 1915.164 Ship's propulsion machinery.

(a) Before work is performed on the main engine, reduction gear, or connecting accessories, the employer shall ensure that the following steps are taken:

(1) The jacking gear shall be engaged to prevent the main engine from turning over. A sign shall be posted at the throttle indicating that the jacking gear is engaged. This sign shall not be removed until the jacking gear can be safely disengaged.

(2) If the jacking gear is steam driven, the employer shall ensure that the stop valves to the jacking gear are secured, and then locked or tagged, in accordance with §1915.89.

(3) If the jacking gear is electrically driven, the circuit controlling the jacking gear shall be de-energized by tripping the circuit breaker, opening the switch, or removing the fuse, whichever is appropriate, and then locked or tagged in accordance with §1915.89.

(b) Before the jacking engine is operated, the following precautions shall be taken:

(1) A check shall be made to ensure that all employees, equipment, and tools are clear of the engine, reduction gear, and its connecting accessories.

(2) A check shall be made to ensure that all employees, equipment and tools are free of the propeller.

(c) Before work is started on or in the immediate vicinity of the propeller, a warning sign calling attention to the fact that employees are working in that area shall be hung in a conspicuous location in the engine room. This sign shall not be removed until it is determined that the work is completed and all employees are free of the propeller.

(d) Before the main engine is turned over (e.g., when warming up before departure or testing after an overhaul) a check shall be made to ensure that all

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employees, equipment, and tools are free of the propeller.

[47 FR 16986, Apr. 20, 1982, as amended at 76 FR 24711, May 2, 2011]

§ 1915.165 Ship's deck machinery.

(a) Before work is performed on the anchor windlass or any of its attached accessories, the employer shall ensure that the following steps are taken:

(1) The devil claws (also known as chain stoppers) shall be made fast to the anchor chains.

(2) The riding pawls shall be in the engaged position.

(3) In the absence of devil claws and riding pawls, the anchor chains shall be secured to a suitable fixed structure of the vessel.

[47 FR 16986, Apr. 20, 1982, as amended at 67 FR 44545, July 3, 2002]

Subpart K—Portable, Unfired Pressure Vessels, Drums and Containers, Other Than Ship's Equipment

§ 1915.171 Scope and application of subpart.

The standards contained in this subpart shall apply to ship repairing and shipbuilding and shall not apply to shipbreaking.

§ 1915.172 Portable air receivers and other unfired pressure vessels.

(a) Portable, unfired pressure vessels, built after the effective date of this regulation, shall be marked and reported indicating that they have been designed and constructed to meet the standards of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, Rules for Construction of Unfired Pressure Vessels, 1963. They shall be subjected to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

(b) Portable, unfired pressure vessels, not built to the code requirements of paragraph (a) of this section, and built prior to the effective date of this regulation, shall be examined quarterly by a competent person. They shall be subjected yearly to a hydrostatic pressure test of one and one-half times the working pressure of the vessels.

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(c) The relief valves on the portable, unfired pressure vessels in paragraphs (a) and (b) of this section shall be set to the safe working pressure of the vessels, or set to the lowest safe working pressure of the systems, whichever is lower.

(d) A certification record of such examinations and tests made in compliance with the requirements of paragraphs (a) and (b) of this section shall be maintained. The certification record shall include the date of examinations and tests, the signature of the person who performed the examinations or tests and the serial number, or other identifier, of the equipment examined and tested.

[47 FR 16986, Apr. 20, 1982, as amended at 51 FR 34562, Sept. 29, 1986; 67 FR 44545, July 3, 2002]

§ 1915.173 Drums and containers.

(a) Shipping drums and containers shall not be pressurized to remove their contents.

(b) A temporarily assembled pressurized piping system conveying hazardous liquids or gases shall be provided with a relief valve and by-pass to prevent rupture of the system and the escape of such hazardous liquids or gases.

(c) Pressure vessels, drums and containers containing toxic or flammable liquids or gases shall not be stored or used where they are subject to open flame, hot metal, or other sources of artificial heat.

(d) Unless pressure vessels, drums and containers of 30 gallon capacity or over containing flammable or toxic liquids or gases are placed in an out-of-the-way area where they will not be subject to physical injury from an outside source, barriers or guards shall be erected to protect them from such physical injury.

(e) Containers of 55 gallons or more capacity containing flammable or toxic liquid shall be surrounded by dikes or pans which enclose a volume equal to at least 35 percent of the total volume of the containers.

(f) Fire extinguishers adequate in number and suitable for the hazard shall be provided. These extinguishers shall be located in the immediate area