

workers must be provided with the appropriate supplemental PPE (requirements for asbestos PPE are set out in 1915.1001).

- Hard Hat
- Safety Glasses
- Work Gloves
- Safety Shoes

(Signed and Dated)

Example 3: Chipper and Grinder Worker.

Based on an assessment of the workplace hazards to which shipyard chipper and grinder workers are exposed, the equipment listed below is the basic PPE required for this occupation. Where workers are exposed to other hazards, such as hazardous dust from chipping or grinding operations, chipper and grinder workers must be provided with the appropriate supplemental PPE.

- Safety Glasses
- Transparent Face Shields
- Hearing Protection
- Foot Protection
- Gloves

(Signed and Dated)

Example 4: Painter. Based on an assessment of the workplace hazards to which shipyard painters are exposed, the equipment listed below is the basic PPE required for this occupation. Where painters are exposed to other hazards, such as a fall from an elevation where no guardrails are present, painters must be provided with the appropriate supplemental PPE.

- Hard Hats
- Safety Glasses
- Disposable Clothing
- Gloves
- Respiratory Protection, including Airline Respirators when working in Confined Spaces
- Barrier Creams

(Signed and Dated)

Example 5: Tank Cleaner. Tank cleaning operations and the basic PPE required for them depend largely upon the type of cargo shipped in the tank. Therefore, the following example is given for a tank in which gasoline has been shipped. Based on an assessment of the workplace hazards to which shipyard tank cleaners are exposed, specifically benzene and flammability hazards, the equipment listed below is the basic PPE required for this situation. Other tank cleaning operations will require variations in the PPE listed below.

- Respiratory Protection, Airline Respirators for working in confined spaces or where personal exposure limits could be exceeded.
- Chemically resistant clothing
- Face Shields
- Chemically resistant boots
- Chemically resistant gloves
- Fall Protection
- Non sparking tools and equipment
- Explosion-proof Lighting

(Signed and Dated)

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

APPENDIX B TO SUBPART I OF PART 1915—GENERAL TESTING CONDITIONS AND ADDITIONAL GUIDELINES FOR PERSONAL FALL PROTECTION SYSTEMS (NON-MANDATORY)

1. *Personal fall arrest systems*—(a) *General test conditions.* (1) Lifelines, lanyards, and deceleration devices should be attached to an anchorage and connected to the body-belt or body harness in the same manner as they would be when used to protect employees, except that lanyards should be tested only when connected directly to the anchorage, and not when connected to a lifeline.

(2) The anchorage should be rigid, and should not have a deflection greater than .04 inches (1 cm) when a force of 2,250 pounds (10.01 Kn) is applied.

(3) The frequency response of the load measuring instrumentation should be 100 Hz.

(4) The test weight used in the strength and force tests should be a rigid, metal cylindrical or torso-shaped object with a girth of 38 inches plus or minus 4 inches (96.5 cm plus or minus 10.16 cm).

(5) The lanyard or lifeline used to create the free fall distance should be the one supplied with the system, or in its absence, the least elastic lanyard or lifeline available to be used by the employee with the system.

(6) The test weight for each test should be hoisted to the required level and should be quickly released without having any appreciable motion imparted to it.

(7) The system's performance should be evaluated, taking into account the range of environmental conditions for which it is designed to be used.

(8) Following the test, the system need not be capable of further operation.

(b) *Strength test.* (1) During the testing of all systems, a test weight of 300 pounds plus or minus 5 pounds (136.08 kg plus or minus 2.27 kg) should be used. (See paragraph (a)(4) above.)

(2) The test consists of dropping the test weight once. A new unused system should be used for each test.

(3) For lanyard systems, the lanyard length should be 6 feet plus or minus 2 inches (1.83 m plus or minus 5.08 cm) as measured from the fixed anchorage to the attachment on the body belt or harness.

(4) For rope-grab-type deceleration systems, the length of the lifeline above the center line of the grabbing mechanism to the lifeline's anchorage point should not exceed 2 feet (0.61 m).

(5) For lanyard systems, for systems with deceleration devices which do not automatically limit free fall distance to 2 feet (0.61 m)

or less, and for systems with deceleration devices which have a connection distance in excess of 1 foot (0.31 m) (measured between the centerline of the lifeline and the attachment point to the body belt or harness), the test weight should be rigged to free fall a distance of 7.5 feet (2.29 m) from a point that is 1.5 feet (45.72 cm) above the anchorage point, to its hanging location (6 feet (1.83 m) below the anchorage). The test weight should fall without interference, obstruction, or hitting the floor or the ground during the test. In some cases, a non-elastic wire lanyard of sufficient length may need to be added to the system (for test purposes) to create the necessary free fall distance.

(6) For deceleration device systems with integral lifelines or lanyards which automatically limit free fall distance to 2 feet (0.61 m) or less, the test weight should be rigged to free fall a distance of four feet (1.22 m).

(7) Any weight which detaches from the belt or harness should constitute failure for the strength test.

(c) *Force test general.* The test consists of dropping the respective test weight once. A new, unused system should be used for each test.

(1) For lanyard systems. (i) A test weight of 220 pounds plus or minus three pounds (99.79 kg plus or minus 1.36 kg) should be used (see paragraph (a)(4) above).

(ii) Lanyard length should be 6 feet plus or minus 2 inches (1.83 m plus or minus 5.08 cm) as measured from the fixed anchorage to the attachment on the body belt or body harness.

(iii) The test weight should fall free from the anchorage level to its handling location (a total of 6 feet (1.83 m) free fall distance) without interference, obstruction, or hitting the floor or ground during the test.

(2) For all other systems. (i) A test weight of 220 pounds plus or minus 3 pounds (99.79 kg plus or minus 1.36 kg) should be used (see paragraph (a)(4) above).

(ii) The free fall distance to be used in the test should be the maximum fall distance physically permitted by the system during normal use conditions, up to a maximum free fall distance for the test weight of 6 feet (1.83 m), except as follows:

(A) For deceleration systems which have a connection link or lanyard, the test weight should free fall a distance equal to the connection distance (measured between the center line of the lifeline and the attachment point to the body belt or harness).

(B) For deceleration device systems with integral life lines or lanyards which automatically limit free fall distance to 2 feet (0.61 m) or less, the test weight should free fall a distance equal to that permitted by the system in normal use. (For example, to test a system with a self-retracting lifeline or lanyard, the test weight should be supported

and the system allowed to retract the lifeline or lanyard as it would in normal use. The test weight would then be released and 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.