Z89.l–1986, ''Personnel Protection—Protective Headwear for Industrial Workers-Requirements,'' which is incorporated by reference, as specified in §1915.5, or shall be demonstrated by the employer to be equally effective.

(2) Protective helmets purchased before August 22, 1996, shall comply with the ''American National Standard Safety Requirements for Industrial Head Protection, Z89.1–1969,'' which is incorporated by reference as specified in 1915.5, or shall be demonstrated by the employer to be equally effective.

§ 1915.156 Foot protection.

(a) *Use.* The employer shall ensure that each affected employee wears protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects or objects piercing the sole.

(b) *Criteria for protective footwear.* (1) Protective footwear purchased after August 22, 1996, shall comply with ANSI Z41–1991, ''American National Standard for Personal Protection-Protective Footwear,'' which is incorporated by reference, as specified in §1915.5, or shall be demonstrated by the employer to be equally as effective.

(2) Protective footwear purchased before August 22, 1996, shall comply with the ''American National Standard for Personal Protection- Protective Footwear Z41–1983,'' which is incorporated by reference, as specified in §1915.5, or shall be demonstrated by the employer to be equally effective.

§ 1915.157 Hand and body protection.

(a) *Use.* The employer shall ensure that each affected employee uses appropriate hand protection and other protective clothing where there is exposure to hazards such as skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns, harmful temperature extremes, and sharp objects.

(b) *Hot work operations.* The employer shall ensure that no employee wears clothing impregnated or covered in full or in part with flammable or combustible materials (such as grease or oil) while engaged in hot work operations or working near an ignition source.

(c) *Electrical protective devices.* The employer shall ensure that each affected employee wears protective electrical insulating gloves and sleeves or other electrical protective equipment, if that employee is exposed to electrical shock hazards while working on electrical equipment.

§ 1915.158 Lifesaving equipment.

(a) *Personal flotation devices.* (1) PFDs (life preservers, life jackets, or work vests) worn by each affected employee must be United States Coast Guard (USCG) approved pursuant to 46 CFR part 160 (Type I, II, III, or V PFD) and marked for use as a work vest, for commercial use, or for use on vessels. USCG approval is pursuant to 46 CFR part 160, Coast Guard Lifesaving Equipment Specifications.

(2) Prior to each use, personal floatation devices shall be inspected for dry rot, chemical damage, or other defects which may affect their strength and buoyancy. Defective personal floatation devices shall not be used.

(b) *Ring life buoys and ladders.* (1) When work is being performed on a floating vessel 200 feet (61 m) or more in length, at least three 30-inch (0.76 m) U.S. Coast Guard approved ring life buoys with lines attached shall be located in readily visible and accessible places. Ring life buoys shall be located one forward, one aft, and one at the access to the gangway.

(2) On floating vessels under 200 feet (61 m) in length, at least one 30-inch (0.76 m) U.S. Coast Guard approved ring life buoy with line attached shall be located at the gangway.

(3) At least one 30-inch (0.76 m) U. S. Coast Guard approved ring life buoy with a line attached shall be located on each staging alongside of a floating vessel on which work is being performed.

(4) At least 90 feet (27.43m) of line shall be attached to each ring life buoy.

(5) There shall be at least one portable or permanent ladder in the vicinity of each floating vessel on which work is being performed. The ladder shall be of sufficient length to assist

employees to reach safety in the event they fall into the water.

[61 FR 26352, May 24, 1996, as amended at 67 FR 44543, July 3, 2002]

§ 1915.159 Personal fall arrest systems (PFAS).

The criteria of this section apply to PFAS and their use. Effective January 1, 1998, body belts and non-locking snaphooks are not acceptable as part of a personal fall arrest system.

(a) *Criteria for connectors and anchorages.* (1) Connectors shall be made of drop forged, pressed, or formed steel or shall be made of materials with equivalent strength.

(2) Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to the interfacing parts of the system.

(3) D-rings and snaphooks shall be capable of sustaining a minimum tensile load of 5,000 pounds (22.24 Kn).

(4) D-rings and snaphooks shall be proof-tested to a minimum tensile load of 3,600 pounds (16 Kn) without cracking, breaking, or being permanently deformed.

(5) Snaphooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook caused by depression of the snaphook keeper by the connected member, or shall be of a locking type that is designed and used to prevent disengagement of the snap-hook by contact of the snaphook keeper by the connected member.

(6) Snaphooks, unless of a locking type designed and used to prevent disengagement from the following connections, shall not be engaged:

(i) Directly to webbing, rope or wire rope;

(ii) To each other;

(iii) To a D-ring to which another snaphook or other connector is attached;

(iv) To a horizontal lifeline; or

(v) To any object that is incompatibly shaped or dimensioned in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself.

(7) On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used for connection to the horizontal lifeline shall be capable of locking in any direction on the lifeline.

(8) Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms.

(9) Anchorages shall be capable of supporting at least 5,000 pounds (22.24 Kn) per employee attached, or shall be designed, installed, and used as follows:

(i) As part of a complete personal fall arrest system which maintains a safety factor of at least two; and

(ii) Under the direction and supervision of a qualified person.

(b) *Criteria for lifelines, lanyards, and personal fall arrest systems.* (1) When vertical lifelines are used, each employee shall be provided with a separate lifeline.

(2) Vertical lifelines and lanyards shall have a minimum tensile strength of 5,000 pounds (22.24 Kn).

(3) Self-retracting lifelines and lanyards that automatically limit free fall distances to 2 feet (0.61 m) or less shall be capable of sustaining a minimum tensile load of 3,000 pounds (13.34 Kn) applied to a self-retracting lifeline or lanyard with the lifeline or lanyard in the fully extended position.

(4) Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet (0.61 m) or less, ripstitch lanyards and tearing and deforming lanyards shall be capable of sustaining a minimum static tensile load of 5,000 pounds (22.24 Kn) applied to the device when they are in the fully extended position.

(5) Horizontal lifelines shall be designed, installed, and used under the supervision of a qualified person, and shall only be used as part of a complete personal fall arrest system that maintains a safety factor of at least two.

(6) Effective November 20, 1996, personal fall arrest systems shall:

(i) Limit the maximum arresting force on a falling employee to 900 pounds (4 Kn) when used with a body belt;

(ii) Limit the maximum arresting force on a falling employee to 1,800