BRIDGE SAFETY STANDARDS FOR MAINTENANCE OF WAY EMPLOYEES

Subpart A - General

49 C.F.R. § 214.1 Purpose and Scope

(a) The purpose and scope of this part is the prevention of accidents and casualties to employees involved in certain railroad inspection, maintenance and construction activities.
(b) This part prescribes minimum Federal safety standards for the railroad workplace safety subjects addressed herein. This part does not restrict a railroad or railroad contractor from adopting and enforcing additional or more stringent requirements not inconsistent with this part.

§ 214.3 Application

This part applies to railroads that operate rolling equipment on track that is part of the general railroad system or transportation

§ 214.5 Responsibility for Compliance

Any person (including a railroad and any manager, supervisor, official, or other employee or agent of a railroad or railroad contractor) who violates any requirement of this part or causes the violation of any such requirement is subject to civil penalty of at least $250 and not more than $10,000 per violation, except that penalties may be assessed against individuals only for willful violations, and where a grossly negligent violation or a pattern of repeated violations has created an imminent hazard of death or injury, or has caused death or injury, a penalty not to exceed $20,000 per violation may be assessed.

§ 214.7 Definitions

Definitions are provided for anchorage, body belt, body harness, lanyard, lifeline, personal fall arrest system, railroad, railroad employee, competent person, deceleration device, equivalent, free fall, free fall distance, railroad bridge, self-retracting lifeline/lanyard and snap-hook.

Subpart B - Bridge Worker Safety Standards

§ 214.101 Purpose and Scope

(a) The purpose and scope of this Subpart is the prevention of accidents and casualties arising from the performance of work on railroad bridges.
(b) This Subpart prescribes minimum railroad safety requirements for railroad
employees performing work on bridges. Each railroad and railroad contractor may prescribe additional or more stringent operating rules, safety rules, and other special instructions not inconsistent with this Subpart.

(c) These provisions apply to all railroad employees, railroads, and railroad contractors performing work on railroad bridges.

(d) Any working conditions involving the protection of railroad employees working on railroad bridges not within the subject matter addressed by this Chapter, including respiratory protection, hazard communication, hearing protection, welding and lead exposure standards, shall be governed by the regulations of the U.S. Dept. of Labor, Occupational Safety and Health Administration.

§ 214.103 Fall Protection, Generally

(a) Except as provided in paragraphs (b) through (d) of this section, a personal fall arrest system or safety net system shall be provided and shall be used where employees are working at least twelve feet above ground or water surface. All fall protection systems required by this section shall conform to the standards set forth in §214.105 of this Subpart.

(b) Installation of the fall arrest system is exempt where installation presents a greater hazard than does the work to be performed. In any action brought by the FRA to enforce the fall protection requirements, the railroad or railroad contractor shall have the burden of proving that the installation of such device poses the greater risk.

Also, this section shall not apply to, employees engaged in inspection of railroad bridges where the railroad or railroad contractor has a written program requiring training in, adherence to and use of safe procedures associated with climbing; the employee has been trained and qualified according to such program and has been voluntarily designated to perform inspections under that program; the employee is familiar with the appropriate climbing techniques associated with all bridge structures that he/she is responsible for inspecting; the employee is engaged solely in moving on or about the bridge or observing, measuring, and recording the dimensions and condition of the bridge; and the employee is provided all equipment necessary to meet the needs of safety.

(c) Additional fall protection is not required on bridges where walkways and railings of sufficient height, width, and strength to prevent a fall exits, provided that the employee does not work beyond the railings, over the side of the bridge, on ladders or other elevation devices, or where gaps or holes exist through which a body could fall. Where used in place of fall protection as provided for in § 214.105, walkways and railings meeting standards set forth in the American Railway Engineering Association's Manual For Railway Engineering satisfy this subsection; and this section is not violated where there are roadways attached to railroad bridges, provided that employees on the roadway deck work or move at a distance of six feet or more from the edge of the roadway deck, or from an opening through which a person could fall.

(d) This section shall not apply where employees are performing repairs or
§ 214.105 Fall Protection Systems Standards and Practices

(a) General requirements. All fall protection systems required by this chapter shall conform to the following:

(1) Fall protection systems shall be used only for employee fall protection.

(2) Once subject to impact loading, the fall protection system must be immediately and permanently removed from service unless fully inspected and determined by a competent person to be undamaged and suitable for reuse.

(3) All fall protection system components shall be protected from abrasions, corrosion, or any other form of deterioration.

(4) All fall protection system components shall be inspected prior to each use for wear, damage, corrosion, mildew, and other deterioration. Defective components shall be permanently removed from service.

(5) Prior to use and after any component or system is changed, employees shall be trained in the application limits of the equipment, proper hook-up, anchoring and tie-off techniques, methods of use, and proper methods of equipment inspection and storage.

(6) The railroad or railroad contractor shall provide for prompt rescue of employees in the event of a fall.

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

(8) Connectors shall be drop forged or pressed or formed steel or made of equivalent-strength materials.

(9) Anchorages, including single- and double-head anchors, shall be capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used under the supervision of a qualified person as part of a complete personal fall protection system that maintains a safety factor of at least two.

(b) Personal fall arrest systems. All components of a personal fall arrest system shall conform to the following standards:

(1) Lanyards and vertical lifelines that tie off one employee shall have a minimum breaking strength of 5,000 pounds.
(2) Self-retracting lifelines and lanyards that automatically limit free fall distance to two feet or less shall have components capable of sustaining a minimum static tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

(3) Self-retracting lifelines and lanyards that do not limit free fall distance to two feet or less, ripstitch, and tearing and deformed lanyards shall be capable of withstanding 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

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

(5) Lifelines shall not be made of natural fiber rope.

(6) The personal fall arrest system shall limit the maximum arresting force on an employee to 900 pounds when used with a body belt.

(7) The personal fall arrest system shall limit the maximum arresting force on an employee to 1,800 pounds when used with a body harness.

(8) The personal fall arrest system shall bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.

(9) The personal fall arrest system shall have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of six feet, or the free fall distance permitted by the system, whichever is less.

(10) The personal fall arrest system shall be arranged so that an employee cannot free fall more that six feet and cannot contact the ground or any lower horizontal surface of the bridge.

(11) The personal fall arrest systems shall be worn with the attachment point of the body belt located in the center of the wearer's back, and the attachment point of the body harness located in the center of the wearer's back near shoulder level, or above the wearer's head.

(12) When vertical lifelines are used, each employee shall be provided with a separate lifeline.

(13) Devices used to connect to a horizontal lifeline that may become a vertical lifeline shall be capable of locking in either direction.

(14) Dee-rings and snap-hooks shall be capable of sustaining a minimum tensile load of 3,600 pounds without cracking, breaking or taking permanent
(15) Dee-rings and snap-hooks shall be capable of sustaining a minimum tensile load of 5,000 pounds.

(16) Snap-hooks shall not be connected to each other.

(17) Snap-hooks shall be dimensionally compatible with the member to which they are connected to prevent unintentional disengagement, or shall be locking snap-hook designed to prevent unintentional disengagement.

(18) Unless of a locking type, snap-hooks shall not be engaged:

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

(ii) To each other;

(iii) To a dee-ring to which another snap-hook or other connector is attached;

(iv) To a horizontal lifeline; or

(v) To any object that is incompatibly shaped to dimensioned in relation to the snap-hook so that unintentional disengagement could occur.

(c) Safety net systems. Use of safety nets systems shall conform to the following standards and practices:

(1) Safety nets shall be installed as close a practicable under the walking/working surface on which employees are working, but shall not be installed more than 30 feet below such surface.

(2) Employees shall be protected by personal fall arrest systems when working surface to the net exceeds 30 feet.

(3) The safety net shall be installed such that any fall from the working surface to the net is unobstructed.

(4) Except as provided in this subsection, safety nets and installation shall be drop-tested at the job site after initial installation and prior to being used as a fall protection system, whenever relocated, after major repair, and at six-month intervals if left in one place. The drop-test shall consist of a 400 pound bag of sand 30 inches, plus or minus two inches, in diameter dropped into the net from the highest (but not less than 3 1/2 feet) working surface on which employees are to be protected.
When the railroad or railroad contractor demonstrates that a drop-test is not feasible and, as a result, the test is not performed, the railroad or railroad contractor, or designated competent person, shall certify that the net and its installation are in compliance with the provisions of this section by preparing a certification record prior to use of the net. The certification shall include an identification of the net, the date it was determined that the net was in compliance with this section, and the signature of the person making this determination. Such person's signature shall certify that the net and its installation are in compliance with this section. The most recent certification for each net installation shall be available at the job site where the subject net is located.

(5) Safety nets and their installations shall be capable of absorbing an impact force equal to that produced by the drop test specified in this section.

(6) The safety net shall be installed to prevent a falling body's contact with any surfaces or structures below the net when subjected to an impact force equal to the drop test specified in this section.

(7) Safety nets shall extend outward from the outermost projection of the work surface as follows:

(i) When the vertical distance from the working level to the horizontal plane of the net is 5 feet or less, the minimum required horizontal distance of the outer edge of the net beyond the edge of the working surface is 8 feet.

(ii) When the vertical distance from the working level to the horizontal plane of the net is more than 5 feet, but less than 10 feet, the minimum required horizontal distance of the outer edge of the net beyond the edge of the working surface is 10 feet.

(iii) When the vertical distance from the working level to the horizontal plane of the net is more than 10 feet, the minimum required horizontal distance of the outer edge of the net beyond the edge of the working surface is 13 feet.

(8) Defective nets shall not be used. Safety nets shall be inspected at least once a week for mildew, wear, damage, and other deterioration. Defective components shall be removed permanently from service.

(9) Safety nets shall be inspected after any occurrence that could affect the integrity of the safety net system.

(10) Tools, scraps, or other materials that have fallen into the safety net shall be removed as soon as possible, and at least before the next work shift.

(11) Each safety net shall have a border rope for webbing with a minimum
breaking strength of 5,000 pounds.

(12) The maximum size of each safety net mesh opening shall not exceed 36 square inches and shall not be longer than 6 inches on any side measured center-to-center of mesh ropes or webbing. All mesh crossing shall be secured to prevent enlargement of the mesh opening.

(13) Connections between safety net panels shall be as strong as integral net components and shall be spaced not more that 6 inches apart.

§ 214.107 Working Over or Adjacent to Water

(a) Where the danger of drowning exists or the water is four or more feet deep, employees shall be provided with life jackets or buoyant work vests meeting the U.S. Coast Guard requirements stipulated in 46 CFR 160.047, 160.052, 160.053. Life preservers complying with U.S. Coast Guard regulations in 46 C.F.R. 160.055 must also be available. This section shall not apply to employees using personal fall arrest systems or safety nets that comply with this Subpart.

(b) Life vests or buoyant work vests shall not be required when employees are conducting inspections that involve climbing structures above or below the bridge deck.

(c) Buoyant vests and life preservers shall be inspected before and after each use by properly trained individuals who have been designated by the railroad. Units with defects that reduce strength or buoyancy are not to be used.

(d) Ring buoys (complying with U.S. Coast Guard requirements at 46 C.R.F. 160.050) with at least 90 feet of line are to be readily available for emergency rescue operations with a distance between buoys of no more than 200 feet.

(e) Requires at least one life-saving skiff, inflatable boat, or equivalent device shall be immediately available determined by a competent person that environmental conditions, including water, water speed, and terrain, merit additional protection, the skiff or boat shall be manned.

§ 214.109 Scaffolding

(a) Scaffolding used in connection with railroad bridge maintenance, inspection, testing, and construction shall be constructed and maintained in a safe condition and meet the following minimum requirements:

(1) The strength of scaffolds and their components, except suspension ropes and guardrail systems, but including footings and anchorage, shall be able to support its own weight and at least four times the maximum intended load applied and transmitted to that scaffold or scaffold component.
Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds applied within two inches of the top edge, in any outward or downward direction, at any point along the top edge.

Top edge height of toprails, or equivalent guardrail system member, shall be 42 inches, plus or minus three inches. Supports shall be at intervals not to exceed eight feet. Toeboards shall be a minimum of four inches in height.

Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150 pounds applied in any downward or outward direction at any point along the midrail or other member.

Midrails shall be installed at a height midway between the top edge of the guardrail system and the walking/working level.

Movement or alteration of a scaffold while it is occupied is prohibited. This paragraph does not apply to vertical movements of mobile scaffolds that are designed to move vertically while occupied.

An access ladder or equivalent safe access shall be provided.

All exposed surfaces shall be prepared and cleared to prevent injury due to laceration, puncture, tripping, or falling hazards.

All scaffold design, construction, and repair shall be completed by competent individuals trained and knowledgeable about design criteria, intended use, structural limitations, and procedures for proper repair.

Manually propelled mobile ladder stands and scaffolds shall be capable of carrying the design load.

All manually propelled mobile ladder stands and scaffolds be capable of carrying the design load.

All ladder stands, scaffolds, and scaffold components shall have support capability of its own weight and at least four times the design working load applied and transmitted to that ladder stand, scaffold, or scaffold component.

All exposed surfaces shall be free from sharp edges or burrs.

The maximum work level height shall not exceed four times the minimum or least base dimensions of any mobile ladder stand or scaffold. When this requirement is not met by the basic mobile unit, either suitable outrigger frames must be used to achieve this least base dimension or the unit must be guyed or braced against tipping.
(5) The minimum work-level platform width for any work level shall not be less than 20 inches for mobile scaffolds (towers), a minimum step-width for ladder stands of 16 inches, and fabrication of ladder stand steps from slip-resistant treads.

(6) Guardrails and midrails shall conform to the requirements listed in paragraph (a) of this section.

(7) A climbing ladder or stairways for access and egress shall be affixed or built into the scaffold, and located so that its use will not have a tendency to tip the scaffold.

(8) Wheels or casters shall be designed to support four times the maximum intended load applied and transmitted to that component. All scaffold casters shall have a positive wheel and/or swivel lock to prevent movement, and ladder stands must have a swivel-type lock on at least two of the four casters.

§ 214.111 Personal Protective Equipment

With the exception of foot protection, the railroad or railroad contractor shall provide and the employees shall use appropriate personal protective equipment described in this Subpart in all operations where there is exposure to hazardous conditions, or where this Subpart indicates the need for using such equipment to reduce the hazards to railroad employees. The railroad or railroad contractor shall require the use of foot protection when the potential for foot injury exists.

§ 214.113 Head Protection

(a) Railroad employees working in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock and burns, shall be provided and shall wear protective helmets.

(b) Helmets for the protection of railroad employees against impact and penetration of falling and flying objects shall conform to the national consensus standards for industrial head protection (American National Standards Institute, Z89.2-1986).

(c) Helmets for the head protection of railroad employees exposed to high voltage electrical shock and burns shall conform to the national consensus standards (American National Standard Institute, Z89.2-1986).

§ 214.115 Foot Protection

(a) The railroad or railroad contractor shall require railroad employees to wear foot protection equipment when potential foot injury may result from impact, falling or flying objects, electrical shock or burns, or other hazardous condition.

§ 214.117 Eye and Face Protection

(a) Railroad employees shall be provided and shall wear eye and face protection equipment when potential eye or face injury may result from physical, chemical, or radiant agents.

(b) Eye and face protection equipment required by this section shall conform to the national consensus standards for occupational and educational eye and face protection (American National Standards Institute, Z87.1-1989, Practice for Occupational and Educational Eye and Face Protection.).

(c) Face and eye protection equipment required by this section shall be kept clean and in good repair. Use of equipment with structural or optical defects is prohibited.

(d) Railroad employees whose vision requires the use of corrective lenses, when required by this regulation to wear eye protection, shall be protected by goggles or spectacle of one of the following types:

(i) Spectacles whose perspective lenses provide optical correction, the frame of which includes shielding against objects reaching the wearer's eyes around the lenses;

(ii) Goggles that can be worn over corrective lenses without disturbing the adjustment of the lenses; or

(iii) Goggles that incorporate corrective lenses mounted behind the protective lenses.

49 C.F.R. Part 214