

## Fall Protection

Work in shipyards and onboard vessels can present numerous hazards, with falls being a leading cause of fatalities and injuries. An average of 141 shipyard workers are injured each year from falls to a lower level.<sup>1</sup> To prevent falls from occurring, employers must assess work activities to determine where fall hazards exist and implement protective measures.

### Work Practices on Vessels that Commonly Require Fall Protection

- Painting vessel exteriors
- Welding on the outside of a vessel's hull
- Work on gantries or masts
- Working near edges and openings

### Fall Protection and Prevention

Fall protection is required when working more than 5 feet above a solid surface or any distance above water (29 CFR 1915.71(j) and 1915.77(c)). For example, when working on scaffolding, staging, runways, or working platforms that are at a height of 5 feet or more, edges must be guarded with guardrails, chains, or ropes. These must be between 42 to 45 inches high and have a midrail located halfway between the upper rail and the working surface (29 CFR 1915.71(j)(1)). When guardrails, chains, and ropes cannot be used, a fall restraint or fall arrest system must be used. Safety belts and body belts are not allowed to be used as part of a fall arrest system (29 CFR 1915.159).

### Fall Restraint System

A fall restraint system is recommended when guardrails or personnel lift devices cannot be used. When properly used, a fall restraint system positions the worker a safe distance from the fall hazard and prevents them from falling off an edge. Lanyards must be of fixed length to prevent the worker from reaching an area where they could fall.

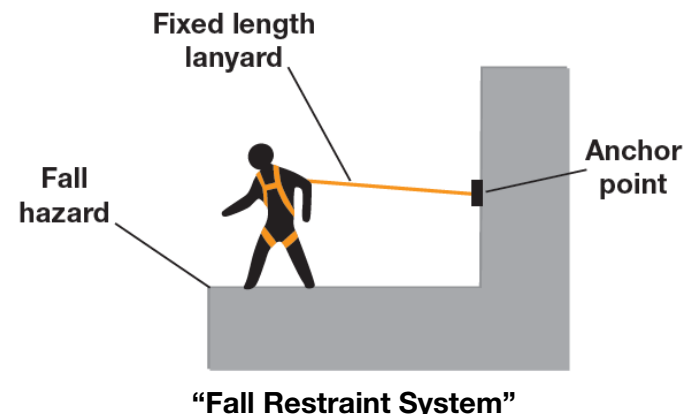
### Fall Arrest System

When a fall restraint system cannot be installed, a fall arrest system must be used (29 CFR 1915.71(j)(3) and 1915.77(c)). A fall arrest system does not prevent a fall, but instead is designed to catch the worker with minimal injury.

The components of a fall arrest system are:

- Connecting means (e.g., locking snaphooks)
- Shock-absorbing lanyard, self-retracting lanyards and lifelines
- Full body harness
- Anchor point (e.g., fixed railing, ship's mast) capable of supporting at least 5,000 pounds per worker

See 29 CFR 1915.159 and 1915.160 for all fall arrest and positioning system requirements.



### To prevent falls, employers must:

- Provide and ensure appropriate fall protection is used where necessary, such as when using half-circle (half-moon) steps in bulkheads of tanks (29 CFR 1915.152). The use of body belts or ropes tied around the waist is prohibited (29 CFR 1915.159).
- Identify all fall hazards and, where possible, use guardrails, chains, and ropes to protect against hazards such as unprotected deck openings/edges and stairwells to eliminate fall hazards (29 CFR 1915.73(d)).
- Establish a proper gangway or ladder to board vessels (29 CFR 1915.74(a)).

1. Bureau of Labor Statistics data, nonfatal occupational injuries associated with falls to a lower level resulting in days away from work for the shipyard industry (NAICS 336611), 2011-2020.

- Practice good housekeeping. Keep cords, tools, and other equipment out of walkways and work areas. (29 CFR 1915.81)
- Ensure cargo spaces contain at least one safe and accessible ladder (29 CFR 1915.76(a)).
- Inspect fall protection equipment for damage or wear before and after each use. If any damage is found, replace the damaged equipment (29 CFR 1915.152(c)).
- When tying off, ensure that the structure used for support can hold a minimum load of 5,000 pounds (29 CFR 1915.159(a)(9)).
- Be sure to rig fall arrest equipment so that workers cannot free fall more than 6 feet or contact the surface below (29 CFR 1915.159(b)(7)).

## Protection from Exposed Edges and Openings

**Edges** of decks, platforms, flats, scaffolding, staging, runways, and similar flat surfaces that are more than 5 feet above a solid surface must be guarded with guardrails that meet the requirements of 29 CFR 1915.71(j)(1) and (2), unless the work being done or physical conditions prevent this (29 CFR 1915.73(d)).



Image shows use of a guardrail at the deck's edge to prevent workers from falling to a lower level.

**Openings** are hazardous when not protected. Hatches or other large openings that are not protected by coamings to a height of 24 inches, must be covered or guarded (e.g., guardrails) to a height of 36 to 42 inches (29 CFR 1915.73(c)). Flush manholes and other small openings must be covered or guarded at a height of 30 inches or more (29 CFR 1915.73(b)). Ensure that where covers are used, they are of suitable material, strength, and size to prevent workers from falling through the opening. It is also important that covers can't be unintentionally moved, such as through the use of cleats, or other methods.



(Left) Image shows a hatch cover with adequate covering.  
(Right) Image shows appropriate use of a "U" bar to temporarily guard flush manholes during shipbuilding and ship repair operations.

## How to Contact OSHA

Under the Occupational Safety and Health Act of 1970, employers are responsible for providing safe and healthful workplaces for their employees. OSHA's role is to help ensure these conditions for America's workers by setting and enforcing standards, and providing training, education and assistance. For more information, visit [www.osha.gov](http://www.osha.gov) or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.



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This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: 1-877-889-5627.



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