BRISTOL
COMMUNITY COLLEGE

ATTLEBORO
FALL RIVER
NEW BEDFORD
TAUNTON
ONLINE

Fall Protection Program

Revision 1

July 2019

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1. Introduction

1.1. It is up to you to make the choice to properly use your personal fall protection. You may not be able to control the force of gravity, but you do not have to fall victim to it. By following established safe work practices and wearing the proper fall protection for your job, you are taking a step in the right direction towards preventing falls in your workplace.

2. Hazard Identification

2.1. The first step in a proactive approach to fall protection involves identifying the potential fall hazards in your workplace. Whether from high or low levels, most potential fall hazards are caused by personal or environmental factors.

2.2. Personal Factors

- 2.2.A. Personal factors that can lead to falls include lack of concentration, poor housekeeping, illness, and improper use of tools and equipment.
- 2.2.B. Know how to properly use fall protection equipment and tools.
- 2.2.C. Keep your work area free from obstructions that could lead to fall hazards.
- 2.2.D. Follow good housekeeping practices and safe work procedures.

2.3. Environmental Factors

- 2.3.A. Environmental factors include wet or slippery surfaces, poor lighting, electrical hazards, changes in the weather, moving mechanical parts that have not been locked and tagged out, and the force of gravity.
- 2.3.B. Know the environmental factors that could lead to falls in your workplace. Engineer out the hazards whenever possible or feasible.

2.4. Engineering Controls

- 2.4.A. A thorough understanding of the fall hazards in your workplace is the first step in fall prevention. Once you recognize that a potential fall hazard exists, you then have two options:
  - 2.4.A.1. Use engineering controls to engineer out the hazard
  - 2.4.A.2. If that is not possible, use personal fall protection

2.5. Once potential fall hazards are identified, steps need to be taken to eliminate or control them. This is done by using engineering controls such as guardrails, safety nets, scaffolds, and aerial platforms. These devices offer protection from falls and can safely elevate the work surface to the necessary height.

2.6. Lockout/tagout procedures may also be necessary to prevent energy from accidentally being released. When engineering controls are not feasible or do not safely eliminate or control the hazard, other forms of fall protection can be used. This includes the use of a personal fall protection system.

3. At What Level is Fall Protection Required?

3.1. In general industry, work levels at a height of 4 feet or more require fall protection. In construction, levels of 6 feet or higher require fall protection.

3.2. Falls from lower levels can be just as dangerous as high-level falls. Areas to be concerned about include stairs, loading docks, trucks, ladders, ramps, uneven surfaces, and more.

4. Selecting a Personal Fall Arrest System

4.1. Before using any personal fall protection system, make sure you know.

- 4.1.A. the limits of the equipment
- 4.1.B. anchoring and tie-off techniques
- 4.1.C. methods of use
- 4.1.D. proper equipment inspection and storage

4.2. The type of system you select and use will depend on your particular work environment. Whatever system you use, regular inspections are necessary to ensure the system is in good working order.

4.3. Many personal fall protection systems are designed for a particular work situation, such as a lineman's body belt and pole strap or a window cleaner's belt. To select a personal fall protection system, you need to examine the work environment it will be used in.

- 4.3.A. The presence of dirt, chemicals, moisture, oil and grease could affect the system.
- 4.3.B. Job activities such as welding, sandblasting and chemical cleaning could damage unprotected components.
- 4.3.C. Hot or cold environments could also have a negative effect.
- 4.3.D. Parts of the system may need to be protected from sharp or abrasive edges and surfaces.
- 4.3.E. Wire rope should not be used where there is a potential electrical hazard.

5. Personal Fall Protection Systems

5.1. The kind of personal fall protection system you use should match your particular work situation and be ANSI (American National Standards Institute) certified. There are three types of personal fall protection systems:

5.1.A. Personal Fall Arrest System
5.1.B. Positioning Device System
5.1.C. Personal Fall Protection System for climbing activities

5.2. Personal Fall Arrest System

5.2.A. Personal fall arrest systems are passive systems that stop a worker in a fall from a working level. Other components may also include a shock absorbing lanyard, deceleration device, lifeline, or a combination of these.

5.3. Positioning Device System

5.3.A. Positioning device systems are used with a body belt or body harness to support a worker on an elevated surface such as a wall or windowsill. This system allows the person to have both hands free to work. Examples of positioning devices include:

5.3.A.1. Belt and Lineman's body pole strap Systems
5.3.A.2. Window cleaner's belts, anchorages and systems

5.4. Personal Fall Protection System for Climbing Activities

5.4.A. Personal fall protection systems for climbing activities are designed to protect the worker from falls while climbing. This type of system does not require the worker to hold, push or pull any part of the system. This leaves both hands free for climbing.

5.4.B. An example of a personal fall protection system for climbing activities is a ladder safety device such as a fixed rail climbing protection system or a rigid rail fall prevention system.

6. Climbing Techniques

6.1. Always keep three points of contact when climbing a ladder: two hands and a foot or two feet and a hand.

6.2. Do not try to carry heavy or bulky objects while climbing a ladder. Use a towline or tool belt to bring the objects up to you.

7. How a Personal Fall Arrest System Works

7.1. A personal fall arrest system stops a worker in an accidental fall. There are three terms you need to know when understanding how a personal fall arrest system works:

7.1.A. free fall
7.1.B. deceleration distance

7.1.C. arresting force

7.2. Free Fall

7.2.A. When a person falls, the fall arrest system does not immediately activate. At this point, the person is in free fall. Free fall is the act of falling before the personal fall arrest system begins to apply force to stop the fall. Free fall distance must not exceed 6 feet with a shock absorbing lanyard, and 2 feet with a retractable lanyard, static line or positioning device.

7.3. Deceleration Distance

7.3.A. After free fall, the personal fall arrest system activates and applies force to stop the fall. This is done through the use of a deceleration device such as a shock absorbing lanyard or self-retracting lifeline. The distance it takes before the worker comes to a stop is called the deceleration distance. Deceleration distance for a fall arrest system must not exceed 3.5 feet.

7.4. Arresting Force

7.4.A. The force needed to stop the worker from falling is called arresting force. The greater the free fall distance, the more force needed to arrest the fall.

7.4.A.1. Deceleration devices absorb and dissipate much of the force needed to stop the fall. A full body harness also distributes the force throughout the body.

8. Using a Personal Fall Arrest System

8.1. There are three parts to a basic personal fall arrest system: a full body harness, a lanyard and an anchorage. Other components to a basic personal fall arrest system include shock absorbing lanyards, vertical and horizontal lifelines, retracting lifelines and rope grabs.

8.2. Full Body Harness

8.2.A. A full body harness is made of straps secured around the thighs, pelvis, waist, chest and shoulders. It lessens the impact to the body when a fall is arrested. A full body harness can be used when the arresting force on the worker is not greater than 1,800 pounds.

8.2.B. Full body harnesses are required for personal fall arrest systems.

8.2.C. The full body harness is attached to a lanyard or lifeline at the D-ring in the center of the back near shoulder level or above the head.

8.3. Harnesses vs. Belts

8.3.A. Full body harnesses are required for a personal fall arrest system. In a fall arrest, a full body harness distributes the impact throughout the body, putting less stress on the body and permitting better circulation. A full body harness also keeps the body suspended upright while waiting for rescue.

8.3.B. A body belt would concentrate the impact of a fall arrest in the midsection. The worker is then suspended from the waist in a bent position which puts more stress on the body and could cut off circulation. There are also documented cases of people falling out of belts while awaiting rescue. Body belts may only be used for positioning devices. They must NOT be used as part of a personal fall arrest system.

8.4. Lanyard

8.4.A. A lanyard connects the full body harness to a deceleration device, lifeline or anchorage. Lanyards are short, flexible lines, usually with connectors at each end, made of rope, high-tensile strength webbing, or steel cable. Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds.

8.4.B. Do not connect a lanyard between a body harness and a self-retracting deceleration device because this can add more free fall distance to the system. Free fall must be limited to h feet or less.

8.5. Snap-hooks

8.5.A. A lanyard needs to be attached to the anchorage point in a way That does not reduce its required strength. If using snap-hooks, this must be done with a locking snap-hook. Snap-hooks and U-rings on the body harness must fit together properly.

8.5.B. A locking snap-hook has a positive locking mechanism and a spring loaded keeper that does not allow the keeper to open under pressure without someone first releasing the mechanism. This prevents roll-out from occurring. Roll-out occurs when the snap-hook accidentally opens.

8.5.C. Do not attach two snap-hooks to each other.

8.5.D. Make sure snap-hooks are compatible with the hardware they are being attached to.

8.6. Anchorage

8.6.A. An anchorage is a secure point of attachment for a personal fall arrest system. It must be independent from the means supporting or suspending a worker.

8.6.B. An anchorage must be able to support a weight of at least 5,000 pounds for each worker attached.

8.6.C. The anchorage should be located at a height that reduces free fall to 6 feet or less. Factors to consider are deceleration distance and elongation. Elongation occurs when the lanyard stretches, or elongates, during a fall. Both elongation and

deceleration distances are available from the equipment manufacturer.

8.6.D. The anchorage should also be located so that if a free fall occurs, will not collide with it or contact any lower level hazard.

8.7. Tie-Off Procedures

8.7.A. The tie-off point to a lifeline or anchorage is usually at or above the D-ring on the back of the worker's full body harness. This reduces free fall distance.

8.7.B. Tie-off is the act of connecting, directly or indirectly, to an anchorage point.

8.7.C. Some ways of connecting to an anchoring system can reduce the strength of a personal fall arrest system and should be avoided.

8.7.D. A tie-off using a knot in the lanyard or lifeline at any location can reduce the strength of the line by 80 percent or more. The lanyard or lifeline should be replaced by one that has the proper connector to eliminate the need for a knot.

8.7.E. A tie-off around “H” or “I” beams can reduce the strength of the line by 70 percent or more. A webbing lanyard or wire core lifeline should be used around the beam to protect the lanyard or lifeline from the sharp beam edges.

8.7.F. Avoid a tie-off around rough or sharp edges.

8.8. Other Components

8.8.A. Other components of a personal fall arrest system include shock absorbing lanyards, vertical and horizontal lifelines, retracting lifelines and rope grabs.

8.9. Shock Absorbing Lanyards

8.9.A. Shock absorbing lanyards are designed to absorb up to 80 percent of the arresting force. They are recommended to reduce the impact of a fall arrest.

8.10. Vertical Lifeline

8.10.A. A vertical lifeline is a flexible vertical line suspended from a fixed anchorage to which a fall arrest device, such as a rope grab, is secured. When vertical lifelines are used, each worker must have a separate lifeline. The reason for this is if one worker falls, the movement of the lifeline during the fall arrest may pull the other workers' lanyards and cause them to fall, too.

8.11. Horizontal Lifeline

8.11.A. A horizontal lifeline is a flexible line between two horizontal fixed anchorages to which the fall arrest device is secured. Horizontal lifelines must be designed, installed and used under the supervision of a qualified person. Horizontal lifeline and

anchorage strength must be increased for each additional employee tied-off to a single line.

8.12. Self-retracting Lifeline

8.12.A. Self-retracting lifelines are portable, self-contained devices that are attached to an anchorage point above the work area. A full body harness is connected by a lifeline to a reel that hangs from the anchorage point. The lifeline freely retracts when the worker moves closer to the anchorage and extends as the worker moves away from it. A self-retracting lifeline can arrest a free fall within 2 feet.

8.13. Rope Grab

8.13.A. A rope grab is a deceleration device that travels on a vertical lifeline attached to an anchorage point. It automatically engages the lifeline and locks to arrest a fall.

9. Inspection

9.1. Fall protection devices must be inspected before each use by a competent person. Harnesses, belts and lanyards need to be examined for mildew, wear, damage and deterioration. Anchor points, snap-hooks, D-rings, scaffolding, guardrails and safety nets should be inspected for damage that could affect their efficiency. Defective or damaged parts must be taken out of service immediately and should be tagged or marked "unusable" or destroyed.

9.2. Personal fall protection systems should be checked for the following:

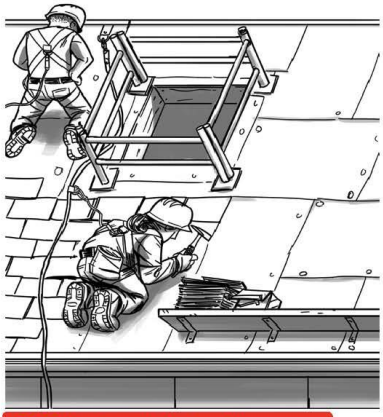
- 9.2.A. Mildew, wear and damage
- 9.2.B. Cuts, tears and abrasions
- 9.2.C. Stretching
- 9.2.D. Loose or damaged mountings
- 9.2.E. Non-functioning parts
- 9.2.F. Cracked, broken or deformed D-rings and snap-hooks
- 9.2.G. Other damage or deterioration
- 9.2.H. Changes that may affect its efficiency
- 9.2.I. Contact with fire, acids or other corrosives
- 9.2.J. Distorted hooks or faulty hook springs
- 9.2.K. Tongues unfitted to the shoulder of buckles
- 9.2.L. Ropes that show wear or internal deterioration.

9.3. Personal fall protection systems that have been used to arrest a fall must not be used again unless they are inspected by a qualified person who determines they are undamaged and able to be reused.

9.4. Any substitution or change to a personal fall protection system should be tested by a qualified person before it is used to determine that it meets the OSHA requirements.

FALLS FROM ROOFS CAN BE PREVENTED!

- Wear a harness and always stay connected
- Make sure your harness fits
- Use guardrails or lifelines
- Inspect all fall protection equipment before use
- Guard or cover all holes, openings, and skylights



DON'T disconnect from the lifeline

DON'T work around unprotected openings or skylights

DON'T use defective equipment

PLAN ahead to get the job done safely.
PROVIDE the right roof equipment.
TRAIN everyone to use the equipment safely.

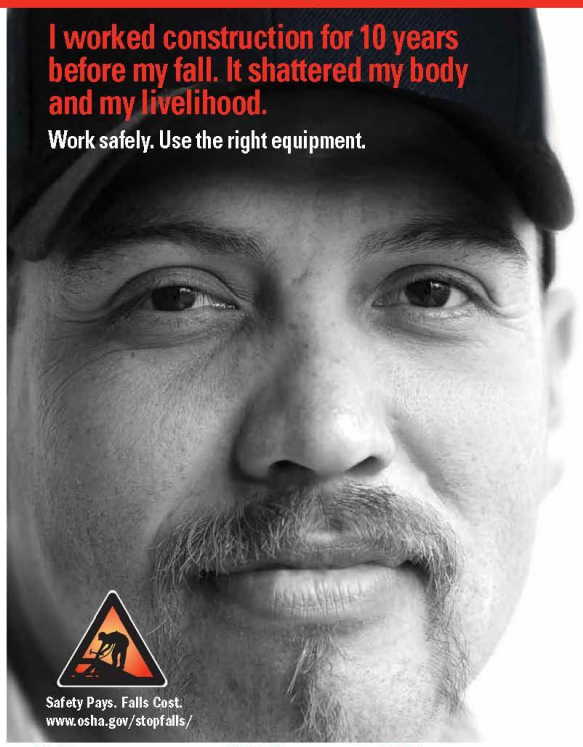
U.S. Department of Labor

CDC Workplace Safety and Health | NIOSH | NORA

OSHA Occupational Safety and Health Administration
1-800-321-OSHA (6742) • TTY 1-877-889-5627
www.osha.gov

NIOSH 2012-142 / OSHA 3533-04 2012

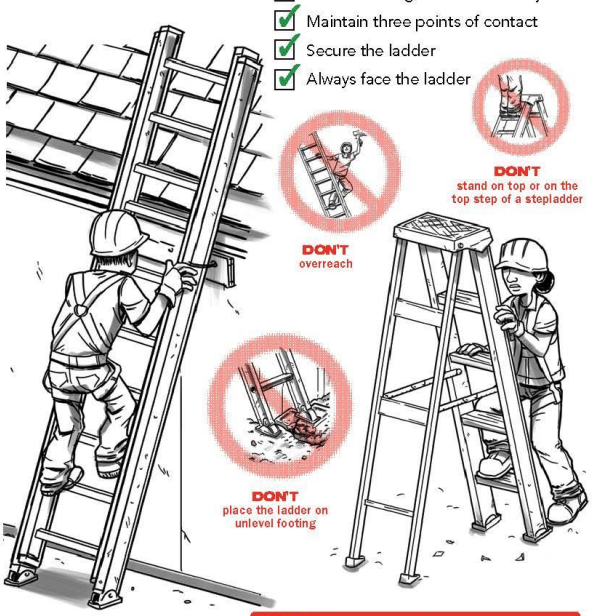
FALL PREVENTION FACT SHEET



PLAN ahead to get the job done safely. **PROVIDE** the right equipment. **TRAIN** everyone to use the equipment safely.

FALLS FROM LADDERS CAN BE PREVENTED!

- Choose the right ladder for the job
- Maintain three points of contact
- Secure the ladder
- Always face the ladder



DON'T stand on top or on the top step of a stepladder

DON'T overreach

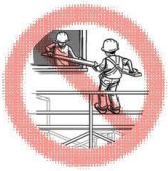
DON'T place the ladder on unlevel footing

PLAN ahead to get the job done safely.
PROVIDE the right ladder and equipment.
TRAIN everyone to use the equipment safely.

FALLS FROM SCAFFOLDS CAN BE PREVENTED!

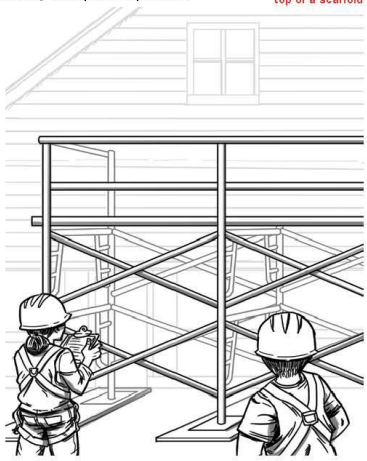
- Use fully planked scaffolds
- Ensure proper access to scaffold
- Plumb and level
- Complete ALL guardrails
- Ensure stable footing
- Inspect before use (by competent person)

DON'T use a ladder on top of a scaffold



DON'T stand on guardrails

DON'T climb cross-braces



PLAN ahead to get the job done safely.
PROVIDE the right scaffold and equipment.
TRAIN everyone to use the equipment safely.