

THE ABC'S OF YOUR PERSONAL FALL ARREST SYSTEM

This easy-to-use Leader's Guide is provided to assist in conducting a successful presentation. Featured are:

INTRODUCTION: A brief description of the program and the subject that it addresses.

PROGRAM OUTLINE: Summarizes the program content. If the program outline is discussed before the video is presented, the entire program will be more meaningful and successful.

PREPARING FOR AND CONDUCTING THE PRESENTATION: These sections will help you set up the training environment, help you relate the program to site-specific incidents, and provide program objectives for focusing your presentation.

REVIEW QUESTIONS AND ANSWERS: Questions may be copied and given to participants to document how well they understood the information that was presented. Answers to the review questions are provided separately.

ATTENDANCE RECORD: Document the date of your presentation as well as identify the program participants. The attendance record may be copied as needed.

INTRODUCTION

Whether you use a personal fall arrest system every day or only once in your lifetime, one thing is for certain: the system won't do any good unless it is used properly. While your company provides fall arrest equipment and training on its use, and mandates that you use this equipment, you ultimately are responsible for using it correctly in all required situations. You should want to use fall arrest systems because you want to survive a fall should one occur; it's that simple.

This video shows viewers how to properly select and use personal fall arrest systems so they can work safely above ground. Topics include forces involved in falls, components of a fall arrest system, inspection of the equipment, calculating fall distance, selection of an appropriate connecting device and the importance of choosing a legal tie-off point.

PROGRAM OUTLINE

FORCES INVOLVED IN FALLS

- When a 220-pound person falls six feet, a huge amount of force is exerted on both the person and on the tie-off point. This force is about 2,500 pounds.
- To avoid a catastrophic failure, an anchor point must have a safety factor of two. This means it must be able to hold 5,000 pounds per person tied off to it. To put this in proper perspective, 5,000 pounds is the weight of a full-sized truck.
- You can't just look at a tie-off point and assume it will hold you, you really need to ask yourself if it will hold a truck.

TIE-OFF POINTS

- Every company has specific rules and procedures regarding tie-off points. Make sure you know and understand what you can and cannot tie off to before you leave the ground.
- Never tie off to conduit, plumbing pipe, electrical conductors or similar items.
- In addition, do not tie to rebar or other composite-type metals. It may look sturdy, but this material does not have the strength to withstand the force of a fall.
- Look to structural supports such as I-beams, ceiling girders or cast concrete supports.

- If no approved tie-offs exist, then horizontal lifelines or other means of protection must be devised by a person deemed competent to devise such a protective system.

COMPONENTS OF A FALL ARREST SYSTEM

- The anchor point is just one of the three critical components of your personal fall arrest system.
- The anchor point, body harness and the connecting device make up the typical fall arrest system. You can think of these items as the “ABC’s” of your fall arrest system.
- We use the term “fall arrest system” because a successful outcome in the event of a fall depends on all of the system: the anchor point, the connecting device and the body harness working together to perform properly.

INSPECTION OF THE FULL BODY HARNESS

- A full body harness is the only type of body wear legal for use in a fall arrest system. Like all other components of the fall arrest system, the harness must be used properly to be fully effective.
- Proper use always begins with an inspection. Check each harness strap for cuts, frays, chemical damage or other defects. Bending the webbing into a “u” shape can help expose hidden damage; be sure to check both sides of each strap.
- Check D-rings for cracks, distortion or rough edges.
- Inspect the buckle for cracks or damage and check for broken stitching around the buckle as well as on the D-ring attachment points.
- Be sure to check the buckle tongues and grommets for distortion.
- Harnesses with damaged webbing, torn stitching or distorted grommets and D-rings should not be used and removed from service.
- Even if no damage is visible, any harness involved in a fall must be removed from service. All fall arrest equipment is designed for one time use only and must not be reused.

PUTTING ON THE HARNESS

- After a successful inspection, you may then put on the harness. One way to sort the harness out is to hold the D-ring and gently shake the harness. If the leg or chest straps are buckled, you should unbuckle them.
- Slip your arms through the shoulder straps so the D-ring is in the back between the neck and shoulder blades.
- Pull the leg straps around each leg and fasten the buckle or tighten the cinch. The leg straps should fit snugly.
- Place the chest strap in the mid-chest area and tighten.
- Some harnesses are more restrictive than others and many workers loosen the straps while working on the ground so they can reach and bend without discomfort. Just be sure to re-tighten them before working above ground.
- A properly-fitted harness works together as one unit, distributing the force of a fall evenly around the body. The rear strap provides a seat, allowing a normal distribution of force while hanging after a fall.
- Falling in a harness with loose leg straps can cause serious damage when the leg straps snap tight. Falling in a harness with the leg straps unbuckled completely can be fatal.

CONNECTING DEVICES

- The third and final piece of the fall arrest system is the connecting devices, which connects the body harness to the anchor point. Many types of connective devices exist, each designed for a specific application.
- In addition to keeping you from hitting the ground, a properly used fall arrest system reduces the forces placed on the body during a fall.
- OSHA requires a personal fall arrest system to reduce the force of a fall to 900 pounds or less. Using a shock-absorbing lanyard as a connecting device is one way to achieve this.
- These types of lanyards feature a section of material constructed in such a manner that it tears away and elongates when subjected to the force of a fall. This absorbs some of the fall energy and brings the worker to a controlled stop.

CALCULATING FALL DISTANCE

- While this type of lanyard improves safety by reducing the force of a fall, it can be dangerous if you fall too far. Since you can't always depend on falling directly into a hole, you need to know how to properly calculate your fall distance.
- The maximum distance a worker will fall from the tie-off point equals the worker's height plus lanyard length plus any lanyard elongation. The maximum elongation of a shock-absorbing lanyard as it deploys is three and a half feet.
- When calculating the fall distance to determine the required height of your tie-off point, always add an additional three feet as a safety factor. This makes the minimum height a six-foot worker can safely tie off with a 6-foot shock absorbing lanyard to be 18½ feet.

SELECTING THE APPROPRIATE CONNECTING DEVICE

- If your anchor point is lower than the required height, you can select shorter lanyard device. A six-foot worker using a two-foot lanyard tied off 11 feet above ground still maintains a three-foot safety factor in the event of a fall.
- In addition, the shorter fall distance of two feet reduces the force of a fall to acceptable levels even without a shock absorber.
- Of course, in some applications, work is difficult when you can only move two feet from the anchor point. For these types of applications, a self-retracting fall-limiting device is a good choice.
- These devices play out when pulled at a normal walking pace and automatically retract when slackened. This allows freedom of movement away from the anchor point.
- In the event of a fall, the device activates a brake that quickly stops the fall.
- These useful devices come in various sizes, with each size and model having different line lengths and braking characteristics. Generally, the smaller modes stop within two feet, making them useful when a shorter fall distance is required.
- Larger models are designed to withstand a full six-foot fall. These models can add up to 3½ feet to your fall distance.
- Be sure you understand the operation of your equipment so you can properly calculate your required fall distance.

HAZARDS POSED BY CONNECTING DEVICES

- As useful as these devices are, they also have potential dangers. Allowing too much line to deploy while moving away from the anchor point can still allow you to hit the ground in the event of a fall.
- Even after the device operates properly, the pendulum effect may still swing a fallen worker into the ground. To avoid this problem, keep the angle of the lifeline within 15 degrees of vertical and always be aware of how much line is deployed relative to your required fall distance.

SELECTING PROPER TIE-OFF POINTS

- In the real world, finding legal tie-off points is sometimes a real problem. When you do find one, it usually doesn't have a D-ring waiting for you to snap in.
- This frequently results in the lanyard being tied off to itself. While this is perhaps the most common method of tying off, it is not safe or legal.
- When a lanyard is tied off to itself, its weight capacity is reduced by half to 2,500 pounds. That makes this tie-off not only illegal but more importantly unsafe.
- This type of tie-off exposes your lanyard to damage from the edges of the anchor point during a fall. The lanyard can be broken or cut in half.
- Tying off in this manner can also cause the lanyard to fall across the keeper gate rather than the top of the hook. While the hook is rated for 5,000 pounds, most keeper gates are only rated for 300-500 pounds and cannot withstand the direct force of a fall.
- Use a beam strap or other anchoring device, which will give you a proper D-ring, resist being cut and withstand the required 5,000 pounds of force.
- When using a beam strap, be sure to take into account its additional length when calculating your fall distance.
- It may take some time and planning to make sure you have a safe tie-off point, but what better place to take a few minutes for safety than when you are working above ground!

CONCLUSION

- Like other pieces of safety equipment, the company provides any required fall arrest equipment, training on this equipment including how and when to use it and requires its use as a mandatory part of the safety program.
- None of that is why you should use fall arrest systems. You want to use fall arrest systems because you want to survive a fall should one occur; it's that simple.
- Anytime we leave the ground, we are exposed to the constant, unwavering force of gravity trying to knock us down. Offset that force with an equally constant, unwavering commitment to the proper use of your personal fall arrest system.

PREPARE FOR THE SAFETY MEETING OR TRAINING SESSION

Review each section of this Leader's Guide as well as the videotape. Here are a few suggestions for using the program:

Make everyone aware of the importance the company places on health and safety and how each person must be an active member of the safety team.

Introduce the videotape program. Play the videotape without interruption. Review the program content by presenting the information in the program outline.

Copy the review questions included in this Leader's Guide and ask each participant to complete them.

Make an attendance record as needed and have each participant sign the form. Maintain the attendance record and each participant's test paper as written documentation of the training performed.

Here are some suggestions for preparing your videotape equipment and the room or area you use:

Check the room or area for quietness, adequate ventilation and temperature, lighting and unobstructed access.

Check the seating arrangement and the audiovisual equipment to ensure that all participants will be able to see and hear the videotape program.

Place or secure extension cords to prevent them from becoming a tripping hazard.

CONDUCTING THE PRESENTATION

Begin the meeting by welcoming the participants. Introduce yourself and give each person the opportunity to become acquainted if there are new people joining the training session.

Explain that the primary purpose of the program is to explain how to properly select and use personal fall arrest systems and to stress the importance of always using this equipment when required.

Introduce the videotape program. Play the videotape without interruption. Review the program content by presenting the information in the program outline.

Lead discussions about job tasks at your facility that require the use of personal fall protection equipment and any incidents in which this equipment saved an employee from injury or death.

After watching the videotape program, the viewer will be able to explain the following:

- How the three components of a personal fall arrest system work together to prevent injuries and deaths;
- How to properly select, inspect and use personal fall protection equipment;
- How to calculate the fall distance between the anchor point and the maximum elongation of the connecting device;
- Why it is so important to choose a safe, legal tie-off point.

THE ABC'S OF YOUR PERSONAL FALL ARREST SYSTEM
REVIEW QUIZ

Name _____ Date _____

The following questions are provided to check how well you understand the information presented during this program.

1. Rebar and other composite-type metals are considered to be legal tie-off points.
 - a. true
 - b. false

2. Proper use of a body harness always begins with _____.
 - a. putting on the harness properly
 - b. connecting the harness to an appropriate connecting device
 - c. an inspection of the harness for damage

3. When calculating the fall distance to determine the required height of your tie-off point, always add an additional _____ as a safety factor.
 - a. 12 inches
 - b. three feet
 - c. six feet

4. A full body harness is the only type of body wear legal for use in a fall arrest system.
 - a. true
 - b. false

5. Which device should be used when you need freedom to move away from the anchor point?
 - a. a shock-absorbing lanyard
 - b. a two-foot lanyard
 - c. a self-retracting lanyard

6. While tying a lanyard off to itself is one of the most common methods of tying off, it is not safe or legal.
 - a. true
 - b. false

7. An anchor point must be able to hold _____ pounds per person tied off to it.
 - a. 500
 - b. 2,500
 - c. 5,000

8. OSHA requires a personal fall arrest system to reduce the force of a fall to 2,000 pounds or less.
 - a. true
 - b. false

ANSWERS TO THE REVIEW QUESTIONS

1. b

2. c

3. b

4. a

5. c

6. a

7. c

8. b