

## **FALL PROTECTION IN INDUSTRIAL AND CONSTRUCTION ENVIRONMENTS**

### **COURSE OUTLINE**

- **At the start of every work day, employees across the country "hit the ground running".**
  - But before the day is over, some of them will also hit the ground because they fell.
- **Falls cause almost 20% of disabling workplace injuries, and thousands of fatalities every year.**
  - But they don't have to happen.
- **You don't have to fall a long way to hurt yourself.**
  - Just hitting the floor from a "standing" position can be plenty serious.
- **In fact, slips, trips and falls are involved in many on-the-job accidents, injuries and even fatalities.**
  - But they can be prevented.
- **A good first "step" in protecting yourself against slips, trips and falls is to remember that all shoes are not created equal.**
- **Some footwear can actually increase your chances of having a fall.**
  - You're more likely to slip when you're wearing shoes with soles that are made out of leather.
  - Sandals and other open-toe designs with straps tend to catch on things and cause trips.
  - High heels may look good, but they're naturally unsteady.
- **Shoes with heels that are low and wide can give you the best footing.**
  - Choose designs with soles made out of textured, "grippy" materials like rubber.
- **For rough, wet or muddy conditions, soles should also have tread that's deep enough to keep your feet planted securely.**

- **It helps to be able to recognize slip and fall hazards ahead of time. Watch out for surfaces that are most likely to be slippery, such as:**
  - Polished marble.
  - Smooth metal.
  - Varnished wood.
  - Ice.
- **Vinyl, unfinished wood or smooth concrete surfaces may only be moderately slippery when they're dry, but can be much more slippery when they are wet.**
- **Water and other liquids are not the only materials that can increase the likelihood of slipping when they accumulate on walking and working surfaces. You should also look out for:**
  - Grease and oil.
  - Dirt, sawdust and other granular materials.
  - Trash and other debris.
- **Good housekeeping provides important protection against many of the slip, trip and fall hazards in a workplace.**
  - Surfaces will always provide better footing when they're kept clean and dry.
- **It's also important not to leave tools, materials and other objects on the floor where people don't expect them.**
  - They can create serious trip hazards.
  - Make sure to pick them up and put them away when you're done with them.
- **Poor maintenance practices can also create slip and trip hazards.**
  - Damaged stair treads, torn carpeting and puddles of water can all lead to nasty falls.
- **If you notice problems like these in your work area fix them yourself if possible or report them to your supervisor so they can be addressed promptly.**
- **Even in a workplace that's clean and well-maintained, falls can still be caused by unsafe work practices.**
  - Stacking up empty pallets to help you reach a high shelf might seem to be a time saver, until the pallets slip and you hit the floor.
  - So don't cut corners.
  - To avoid falls think safety first.

- **Most of the slips, trips and falls that occur on stairways are actually caused by careless behavior. You should never:**
  - Run on stairs.
  - Skip steps.
  - Carry things up or down that are so big you can't see where you're putting your feet.
- **Instead, make a habit of keeping one hand on the railing whenever possible, just in case.**
- **When you take a step forward you naturally expect the floor to be there when your foot comes down.**
  - But in many workplaces you can encounter "edges" and "openings" where the walking surface ends and a fall hazard begins.
- **Hazardous "edges" can exist on stairs, catwalks, rooftops and elevated platforms such as loading docks.**
- **"Openings" can include skylights, "pits" in the ground such as manholes, and holes in a structure's walking surfaces where stairways or ladders pass through.**
- **Taking a careless step in any of these areas can lead to a serious fall, and a significant injury.**
  - These hazards can be reduced by a type of fall protection known as "guarding".
- **Guarding protects people from fall hazards by putting physical barriers in their way.**
  - The wire mesh that is installed over skylights is one type of guarding.
  - So are the covers that are placed over manholes.
- **The most common way to guard edges and openings is to install a "railing".**
  - Railings are so important for preventing workplace falls that the Occupational Safety and Health Administration (OSHA) has established standards for their construction and use.

- **An OSHA-compliant "standard railing" consists of a top rail at least 42 inches high, with a midrail at about half that height, and vertical uprights to support them.**
  - The railing must be able to support at least 200 pounds, the weight of an average worker.
  - In most cases the railings must be installed wherever a person could fall four feet or more to a lower level.
- **Railings can be built to address another type of fall hazard that exists at edges and openings as well.**
  - Tools or materials that roll, slide or get kicked off a work surface can create serious hazards for people below.
- **To prevent falling object hazards like these, railings can be equipped with screens or "toeboards".**
  - Screens cover a railing from top to bottom, to prevent objects from falling through.
  - Toeboards are horizontal barriers at least four inches high that are built into a railing at floor level to prevent objects from going over the edge.
- **If you ever encounter an unguarded edge or opening in your workplace, tell your supervisor immediately so guards can be installed as soon as possible.**
- **Whenever there's work to be done in high places, different types of ladders can provide convenient and practical ways for employees to get up there.**
  - Portable ladders, such as straight ladders, extendable ladders and step ladders, are designed to be easy to carry and set up where you need them.
  - "Fixed ladders" are built permanently into structures where climbing must be done on a regular basis.
- **While ladders can be easy to use, they still require you to follow safe work practices when you're working with them.**
- **This starts with making a thorough inspection of the ladder before you use it.**
  - Make sure it's free of defects or damage.
  - Look for rust and corrosion and broken, loose or missing parts as well.
- **If you find problems, don't use the ladder.**
  - Take it out of service.
  - Tag it *"Dangerous, Do Not Use"*.
  - Then get a replacement.

- **When setting up a portable ladder, you should make sure both its feet are firmly positioned and level.**
  - If the ground is uneven, use boards or a ladder jack to level out the footing.
- **If you're leaning a straight ladder against a wall, roof or other platform, use the "four to one ratio" for the best angle for safe climbing.**
  - For every four feet of vertical height, place the bottom of the ladder one foot "out" from whatever it's leaning against.
- **The ladder should also be long enough to extend at least three feet above where you're climbing to, so you have something to hold onto when you get there.**
- **To avoid falls when you are climbing a ladder, follow the "3-Point Rule".**
  - Keep two hands and a foot, or one hand and two feet in contact with the ladder at all times.
  - Don't try to climb with anything in your hands, such as tools or buckets.
  - Attach tools to a tool belt, and haul buckets up after you later, with a rope.
- **To help maintain your balance...**
  - Keep your belt buckle centered between the rails of the ladder.
  - Don't lean back.
- **It's especially important to follow the 3-Point Rule and maintain your balance on fixed ladders, because they tend to be very long.**
- **The "cages" and "wells" that are built around fixed ladders used to be considered sufficient protection against falls.**
  - OSHA is currently phasing in a standard that requires more effective systems such as "ladder safety devices" and "personal fall protection" to be used on all fixed ladders that are longer than 24 feet.
- **These systems not only help to prevent falls but can also stop any falls that do occur.**
  - They typically consist of a body harness for the climber, linked to a ladder-mounted brake mechanism or a self-retracting lifeline that is anchored to the structure.
  - Make sure you know what protections are available if you use fixed ladders in your job.

- **While ladders can get you where you want to go in many situations, sometimes a scaffold is what you need when you're working off the ground.**
  - Scaffolds can be supported from below on frameworks or suspended from above by cables in order to provide secure walking and working surfaces up high.
- **But scaffolds are involved in thousands of worker injuries and more than fifty fatalities each year, many of them resulting from falls.**
  - OSHA (the Occupational Safety and Health Administration) has established safety standards to reduce scaffold hazards.
- **The OSHA regulations are too involved to describe in detail here, but we can provide an overview of what you should do to help protect against a fall if you're working on a scaffold.**
- **While fall protection must be used on any scaffold where the platform is 10 feet or more off the ground, safe work practices should begin before you even get up there.**
- **Never try to reach the platform of a supported scaffold by climbing on the framework.**
  - This bracing is not designed to support a climber, and its angled surfaces make it very easy to lose your grip and fall.
- **Instead, you should use stairs that are built into the framework, a stairway tower that is attached to it, or a ladder.**
  - If you do use a ladder it should be secured to the scaffold's framework so that it can't be knocked loose.
- **Once you're up on the work platform, it's important for you to keep clutter to a minimum.**
  - Tools, materials and debris that get underfoot can create serious slip, trip and fall hazards.
  - If any of these things fall off the platform, they can create serious problems for people below.
- **To keep the scaffold platform clear you should...**
  - Put tools and equipment away when you're done with them.
  - Dispose of trash and debris as soon as possible, by the end of your shift, at the least.

- **When you're working on a scaffold, you should never try to use building materials, buckets or other objects as make-shift ladders or stools to extend your reach.**
  - They're likely to slip or tip while you're on them, and cause you to fall.
- **In addition to safe work practices, you should also use fall protection equipment when you're on a scaffold. This can include:**
  - Guardrails.
  - Safety nets.
  - Personal fall protection systems.
- **Scaffold railings should be installed 39 - 45 inches above the scaffold platform, and must be able to support the weight of an average worker falling against them.**
  - They should also be equipped with screens and/or toeboards to prevent any objects from going overboard.
- **Safety nets can be slung under the work platform to catch anything or anyone that falls, so they don't hit the ground.**
- **Personal fall protection can not only prevent a fall, but also safely stop one that does occur.**
  - Personal fall protection systems typically consist of a body harness that is linked to an anchor point.
- **If you have any questions about whether you should be using personal fall protection, or how the equipment should be assembled or anchored, you should talk to your supervisor.**
- **All fall hazards should be taken seriously.**
  - But the fall hazards in some situations, such as on rooftops, scaffolding and long fixed ladders, can be especially dangerous.
- **That's why OSHA requires employees to use personal fall protection in situations like these.**
  - This is equipment that you wear.
  - It not only can help to prevent you from falling, but also stop a fall if one occurs.

- **A Personal Fall Arrest System, or PFA, typically consists of three components:**
  - A body harness.
  - A connecting device.
  - An anchorage.
- **The body harness is the part of the system that you actually wear on your body.**
  - Since stopping or "arresting" a fall requires the system to absorb thousands of pounds of force, you should adjust the straps of the harness to fit as snugly as possible around your thighs, shoulders, chest and pelvis.
  - This helps to distribute the forces of a fall evenly across your torso, preventing injury.
- **The connecting devices are the part of the PFA that links the body harness to an anchorage.**
  - Connecting devices such as self-retracting and fixed lifelines can add "slack" to a fall arrest system, so that you and your coworkers can move more freely as you work.
  - Elastic lanyards not only provide freedom of movement but can also help to absorb shock in case of a fall.
- **The anchorage for a PFA has to be strong enough to support your weight and absorb the energy that is built up during a fall.**
  - So OSHA requires an anchorage to be capable of sustaining a minimum load of 5,000 pounds for each person who is connected to it.
- **This is why personal fall protection should never be anchored to structures that are too weak to stop a fall, such as:**
  - Standpipes.
  - Piping systems.
  - Vents.
  - Electrical conduit.
- **Depending on the situation, OSHA specifies that PFAs should be secured to:**
  - Substantial members of scaffold frames or the structures that are being worked on.
  - Sliding brake systems on fixed ladders.
  - Designated attachment areas on manlift cages.



- **Information on which setup you should use with your PFA can be found in the Fall Protection Plan that your employer creates for each project.**
  - Fall protection plans address the unique fall hazards of individual worksites while taking specific OSHA regulations into account.
- **If you will need to wear a PFA on the job, your employer will provide you with the appropriate equipment as well as training on how to use it safely.**
  - If you have any questions about your employer's Fall Protection Plan or your PFA, talk to your supervisor.

**\* \* \* SUMMARY \* \* \***

- **Many slip, trip and fall hazards can be eliminated by adhering to safe work practices and using appropriate footwear.**
- **Falls to a "lower level" can be prevented by "guarding" hazardous edges and openings with railings, manhole covers and other protective systems.**
- **When using ladders you should always inspect them thoroughly, set them up properly and climb them carefully.**
- **To work safely on scaffolds, you need to adhere to required safety procedures and use appropriate fall protection equipment.**
- **If personal fall protection is needed in your work, your employer will provide you with appropriate equipment and training on how to use it safely.**
- **Now that you understand the different types of fall hazards that you can encounter on the job, and know the safe work practices and equipment that you can use to avoid them, you can help to ensure that you and your coworkers head home safely at the end of every day!**