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## TRAIN THE TRAINER: PPE

### Teaching Fall Protection: How to Make an Impact

**F**all protection is a complex subject. It takes hours, if not days, just to come to grips with the regulatory requirements. And the regulations represent only a minimum standard. As safety professionals, we should be concerned with not just meeting the regulations but going beyond them. That might involve implementing voluntary standards from organizations such as ANSI and CSA. And, of course, we must also consider the recommendations of the PPE and equipment manufacturers.

**When you teach fall protection, try to present a more holistic view—to put the fall protection issue into perspective in a way that is meaningful to the workers. Here's an approach you can use.**

### Start with the Facts

When training workers, your goal should be to make sure they know how to assess the risks associated with their job. You don't want employees to follow safety training only during the 30 minutes that you're there. You want them to do it all the time because it's the safe thing to do. To get this result, you must impress upon the crew the seriousness of falls. Fall protection is not a topic to be sugar-coated. Start your training sessions with these facts:

- Falls are the greatest cause of fatalities in construction;
- 50% of falls over 11 feet result in fatalities. (Since this is an average, some falls under 11 feet are also fatal.); and
- It takes just one second to fall 16 feet.

You can deliver this last statistic as a pop quiz: "How long does it take to fall 16 feet?" Pause for a second, then snap your fingers with the response. "That's it—one second!" move the mental safety net many workers rely on. Tell

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the class: "If you go over the edge, that's it, you are gone! Your buddy may feel sorry for you, but he is not going to be able to grab you to pull you back."

Of course, there's always someone who thinks they will catch something on the way down. But talk with workers who have fallen with no fall protection (including through scaffolding). Odds are not one of them said they were able to grab something to stop the fall. All they did was beat themselves up on the way down.

To emphasize the point, stand with one arm straight out from your shoulder, and ask what would happen if you fell from 100 feet and grabbed something halfway down. The answer is always that you'd pull your arm off.

## Teach Basic Risk Assessment

Now you have the class actually thinking about falls. For the remainder of the class, ask them to consider:

- What is required (what the regulations say); and
- What should be done (what is the safest or best industry practice)?

Then ask: When should you use/or need fall protection? It usually takes about 3 or 4 minutes before they come up with the desired response, "When you can fall and get hurt!"

To make the point that they should not concentrate on the "Minimum Standard of 10 feet\*," it's time for another pop quiz: If a person is six feet tall and they are on a ladder with their feet at the five-foot level and they fall, how far do they fall?

Answer: 11 feet (their head falls 11 feet to the floor), which may put them in the 50% fatality category!

This is the thinking part to which you have led the class and now they should be ready to participate in a meaningful lesson on fall protection details.

\*OSHA requires fall protection be provided at elevations of four feet in general industry workplaces, five and six feet in the construction industry. In many jurisdictions in Canada, the minimum standard for construction is 10 feet or 3 meters.

## Conclusion

The main point here is to get people to think for themselves and to develop as second nature two basic concepts when working at heights:

- The primary goal is not to fall.
- The secondary goal is to fall the least distance possible.

If your crew follows these lessons, they won't have to worry about remembering all the regulatory technicalities. ❖

## THE ABCD'S OF PFAS

# Help Workers Remember How to Stay Safe Working at Heights

## Passive and Active Fall Protection

The best fall protection is a passive system that doesn't rely or require a worker to do anything - they don't have to select or wear fall protection. Passive systems include guardrail systems and safety nets. Passive systems aren't always possible to install and use however, and that's when active fall protection is needed.

One type of active fall protection is a personal fall arrest system or **PFAS**. When used correctly a PFAS can stop (arrest) a falling worker from hitting the surface or ground below. A PFAS consists of a full-body harness, a shock-

absorbing lanyard or retractable lifeline, and a secure anchor/s point. If any part of the system fails, the worker is put at a high risk for injury or death.

## Training

Considering the importance of a PFAS as a life-saving device, it makes sense that it to be used correctly and be in good condition.

Of course, this involves training. Before performing work at height that requires the use of a PSAF, your workers must be trained on:

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## ABOUT US



- the safe way to wear a PSAF;
- how to safely use a PSAF, including which anchor points are suitable – and which are not;
- the rescue plan; and
- inspecting and caring for the PSAF.

## Training Fails

Even after training, how often do you see these PFAS blunders?

- A worker wrapping their lanyard around a beam or pipe and then tying the lanyard back on itself.
- A 6-foot shock-absorbing lanyard tied off to a waist-level anchor point on a worker who is working 6 feet off the ground.
- A narrow piece of PVC piping or other structure that you know can't stand up to the force of a fall.

## The ABCD's of PFAS

Here's an easy way to reinforce your training and help your workers remember some of the more pertinent points.

### A – Anchor Point

In technical terms, an anchor point is a secure point of attachment for your fall arrest system's lanyard or lifeline. In other words, it'll be supporting your weight and fighting gravity's forces if you fall. You want to tie-off to something sturdy!

- Anchor point locations should be planned out before work begins. If not, or you're ever not sure what to tie-off too, ASK before you tie-off.
- The anchor point should be attached to a substantial structural member, such as a beam, girder, roof truss or rafter.
- And here's why. An anchor point must support either 5,000 pounds per worker (the weight of two small cars) or twice the intended load.

### How Not to Die

- Don't use a roof pipe or vent as an anchor point. They are not designed to support the required 5,000 pounds per worker. Instead, use an anchor point that has been engineered and installed for the job, or another approved anchor point.



- Never use sheetrock screws to install an anchor point either – they are great for sheetrock – but are NOT designed for fall arrest.

### B – Body Harness

A full-body harness is required for a PFAS. The body harness distributes the force of a fall to reduce the chance of bodily injury. It includes shoulder and thigh straps, and a D-ring.

#### How Not to Die

- Body belts should never be part of a PFAS. Body belts have been banned for use with personal fall arrest systems for years. Why's that you ask? Take a look at these stats from a study OSHA and engineers at Wright Patterson Airforce Base did in the mid-80's.
  - An average-sized woman, they calculated, could live two and a half minutes before dying of asphyxiation or internal injuries caused by the belt.
  - A man would survive for about 32 seconds.In a harness, however, a worker could survive between 19 and 29 minutes.

<https://www.ishn.com/articles/82312-banning-body-belts>



- Make sure that D-rings are larger than the snap hook.
- The connecting D-ring in a properly fitted harness should be in the center of the upper back.

### C – Connecting Device

A retractable lifeline or shock-absorbing lanyard and its connectors are used to link a full-body harness to the anchor system. Different types of connectors include carabiners, snap hooks, D-rings, and rope grabs. Connectors must have a minimum tensile strength of 5,000 pounds.

#### How Not to Die

- Never hook lanyards together unless manufacturer approved.
- Don't ever tie a knot in a lanyard or lifeline – doing so reduces the strength by at least 50%.
- Shock-absorbing lanyards and retractable lifelines are rarely compatible—so DON'T connect them.

### D – Descent & Rescue

Your employer is required to have a rescue plan for rescuing a worker whose fall has been arrested. Prompt rescue is important to your safety after an arrested fall.

#### How Not to Die

- If you're not sure what the rescue plan is – ASK! Suspension trauma can set in quickly once your PFAS stops your fall. You will literally be left hanging there until someone rescues you or you are somehow able to perform self-rescue. ❖

## Fall Hazards and Falls from Heights

### WHAT'S AT STAKE?

New York Post - Two construction workers fell, one fatally, at an under-construction building development in Manhattan's Hudson Yards, only hours after another worker plunged to his death in a separate incident in lower Manhattan.

According to authorities, the workers at the Hudson Yards site fell about 35 feet while operating a forklift cage that collapsed. A 45-year-old worker was found with severe body trauma and pronounced dead at the scene. His co-worker, a second 45-year-old worker, suffered trauma to his head and body, and was rushed to Bellevue Hospital but in stable condition, police stated. About five hours earlier, worker Juan Chonillo, 43, of Queens, fell from the 29th story of an under-construction high-rise in the Financial District, to the top of a 1st floor scaffolding, authorities said. The father of five apparently missed the clipping to a security hook and plunged from the shaking platform he was on while erecting building materials, workers at the site said.

The news reports above indicate that falls can happen anytime, at any worksite, and should be among the top safety concerns for workers on the job.

### WHAT'S THE DANGER?

Fall hazards are present at most worksites and workers are exposed to these hazards daily. A fall hazard is anything at your worksite that could cause you to lose your balance or support, and result in a fall - specifically a fall from heights. Some of the major working conditions that contribute to fall hazards include unprotected edges of raised work surfaces (ex: roofs), unsafe scaffolds, working over water, and ladder risks.

#### Unprotected Edges

- One of the most common hazards of roofing is unprotected sides and edges.
- Falls to a lower level are also a major cause of fatalities in construction in general.
- Improperly covered or protected floor holes and openings are another common fall hazard. It is easy to step into one if you're carrying something that blocks your view; or is partially hidden by a shoddy cover; or to step back and fall because you forgot or didn't know there was an unprotected edge behind you.

#### Inadequate Scaffolds

- Working with heavy equipment and building materials on the limited space of a scaffold is difficult. Without fall protection or safe access, it becomes hazardous.

- Most workers injured in scaffold accidents blame the accident on factors like planking or support giving way, or to lack of guardrails or another type of fall protection.
- The most frequent hazards include lack of fall protection, scaffold access, use of aerial lifts without a harness and lanyard, platform construction and improper worker training.

#### Unsafe Ladders

- Factors that contribute to falls from ladders are ladder slip (top or bottom), overreaching, slipping on rungs/steps, defective equipment and improper ladder selection.
- Risky ladder misuse includes not having a portable ladder extend 3 feet above the landing, no worker training, and improper use of the top of stepladders.

### HOW TO PROTECT YOURSELF

As a rule, fall protection is required for heights of six feet (3 meters) or more for construction work. However, regardless of the fall distance, protection must be provided when working over dangerous equipment and machinery. Ensure your fall protection is right for the work you are doing, in good condition, and you're using it properly.

- The three main methods of fall protection are guardrails, safety nets, and personal fall arrest systems.
- Of course, it's better to prevent a fall using guardrail systems and the like, versus stopping or arresting a fall using fall protection and nets.
  - Safety nets are designed to catch you and break your fall. They must be placed as close as possible under the working surface, but never more than 30 feet below.
  - A personal fall arrest system consists of an anchorage, connectors, and a full-body harness that work together to break your fall.
- Remember, your employer must provide protection to prevent falls. Here are some things they should do to prevent fall hazards and falls:
  - Develop a written fall protection plan.
  - ID fall hazards before each project and during daily walk-arounds.
  - Eliminate the need for fall protection by rescheduling the task, isolating the task, or changing the task.
  - Confirm fall protection equipment is appropriate to the task, in good condition and used properly.

- Regularly conduct fall prevention training and cover the specific fall hazards and PPE required to work safely.
- Conduct regular inspections of fall protection equipment as set by manufacturer recommendations and federal, state, or provincial requirements.
- Emphasize fall hazards unique to the site, such as open floor holes or shafts, riser penetrations and skylights, or water hazards.

### FINAL WORD

*Fall hazards are extremely common, but with proper training, active fall controls like guardrails, and general fall prevention awareness, falls can be avoided. ❖*

## TEST YOUR KNOWLEDGE

1. Personal fall arrest systems are the best protection because they are personalized to the worker's safety.  True  False
2. Fall protection is only required when construction is over 10 feet in height.  True  False
3. Ladders should extend one foot over the landing.  True  False
4. General fall protection training given on an annual basis is sufficient training for workers.  True  False

### What Would You Do?

You notice your co-worker standing on a tilt-up concrete wall, throwing out bridging. He is wearing a harness and lanyard but is not tied off. What would you do?

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Quiz Answers: 1. False 2. False 3. False 4. False



**TOOL BOX**

**Fall Protection Training Verification Form**

**A**dapt this form for your OHS program and the requirements of applicable OHS laws on PPE. Use it to document that you've provided fall protection training to workers, what that training covered and that the workers understood their training and demonstrated how to use the equipment on which they were trained. Retain these completed forms in the event your fall protection training is questioned.

Worker's Name: \_\_\_\_\_ Worker ID No. \_\_\_\_\_

Job title/Work area: \_\_\_\_\_

Trainer's Name (person completing this form): \_\_\_\_\_

Date of Training: \_\_\_\_\_

Types of Fall Protection Systems, Equipment, and Devices worker is being trained to use:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Verification of Proficiency**

The following information and training on the fall protection equipment listed above were covered in the training session and the worker has demonstrated proficiency in these areas:

- What hazards the worker faces, the types of fall protection equipment the worker must use to protect against these hazards and how the equipment will protect the worker while doing his/her tasks.
- The limitations of the fall protection systems, equipment, and devices to be used.
- When the worker must wear or use the equipment.
- How to use the equipment properly on-the-job, including selecting, putting it on, taking it off, and wearing and adjusting it (if applicable) for a comfortable and effective fit.
- How to properly care for, maintain, and inspect the fall protection equipment: look for signs of wear, clean and disinfect, and when and how to dispose of and replace the equipment.

**Note to worker:** This form will be made a part of your personal file. Please read and understand its contents before signing.

(Worker) I understand the training I have received, and I can use fall protection equipment properly.

Worker's signature: \_\_\_\_\_ Date: \_\_\_\_\_

- Worker has shown an understanding of the training.
- Worker has shown the ability to use the fall protection equipment properly.

Trainer's signature : \_\_\_\_\_ Date: \_\_\_\_\_

## INSIGHT

# What's your Deep Fryer Test?

By Hayden Greenshields

Earlier in my safety career, I came across a Safety Officer who provided me with an excellent heuristic or rule of thumb when it comes to determining adequacy of training. The Safety Officer, Randy, would often pick me up at my office and tour other worksites as a 'ride along' to provide me with insight on what to be looking for when it comes to worksite inspections from a Regulator.

On one of those occasions, Randy would describe to me his rule of thumb when it comes to the adequacy of training through the Deep Fryer Test. Bewildered, I asked what does a deep fryer have to do with the adequacy of training? Randy would go on to say that, "As an employer, McDonalds® would take five hours to train their crew members on the use of a deep fryer" while simultaneously raising his right hand in the air to clearly show his five fingers. I was reluctant to ask the obvious rhetorical question and thought to myself, why would it take five hours to train someone on how to use a deep fryer? Am I missing something? I thought all a worker does is lower a basket filled with frozen fries into cooking oil, remove it once it's cooked and sprinkle some salt. No wonder it takes forever to get my fries...

All jokes aside, I was curious on why the Deep Fryer Test was held so high in Randy's mind.

### The 3 'D's of Training

Randy went on to describe that the Deep Fryer Training requires the supervisor to follow the three 'D's of training:

**Describe, Demonstrate and Do.**

- The supervisor would describe how to use the deep fryer to a new employee, keeping in mind of productivity, quality and safety.
- Then the supervisor would demonstrate how to properly use the deep fryer.
- Lastly, the employee would 'Do' the task of using the deep fryer by themselves.

The supervisor would closely observe and correct behavior when needed, then when the supervisor felt comfortable, would distance themselves from the employee and return less and less frequently to correct unsatisfactory behavior.

Once the supervisor felt completely comfortable leaving the employee to work by themselves with the deep fryer, the supervisor would document that the employee was competent to perform the task.

Randy explained that the supervisor was not only demonstrating, and in some cases, simulating, what the work task would be ninety-five percent of the time, but also how the employee should react when under pressure. The entire choreography of how food was ordered, prepared and

served including the performance of the surrounding crew members was taken into consideration on how those other factors can influence the deep fryers ability to perform their work positively or negatively.

### Last Token of Wisdom

It was close to the end of my shift and Randy pulled the vehicle into the Atco trailer where my site office was and gave me one last token of wisdom on the Deep Fryer Test before he departed. "If I am evaluating the adequacy of a company's training program, I will ask the supervisor, what is the Deep Fryer Test for those specific pieces of equipment, tools or machinery? If the supervisor's answer did not provide an adequate response, I would dig deeper."

He goes on to say that too often he inspects worksites for companies that give the keys to a half million-dollar piece of machinery to new employees and expects that they can perform their work efficiently and safely. "What is their Deep Fryer Test on this piece of equipment? If McDonalds® spends 5 hours of training on using a deep fryer, how many hours should they spent on an Articulating Rock Truck?"

### Critically Examining Your Training Program

That rule of thumb, which feels like eons ago, is still permanently tattooed in my brain. Now, as a Safety Consultant, I ask my clients on what their Deep Fryer Test is on the multitude of tools, equipment, machinery they have their workers use on a daily basis, not as a means to benchmark or measure their performance, but as a discussion point. This allows clients to take a step back and critically examine their training.

For organizations starting their training programs or for those who have an established training program, take Randy's advice and ask yourselves, what is our Deep Fryer Test? ❖



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PICTURE THIS

Watch Your Step!

It's not clear from the picture how this gentleman arrived at his precarious perch. What is clear, is that he's got a fast way to get down—straight through the unprotected openings behind and to the side of him. Let's break this down:

1. All it would take for our wayward roofer to meet his demise would be losing his balance from a slight wobble or sway caused by standing up after being bent over.
2. Or maybe he'd be so focused on his current task that he'd forget the sketchy platform he was standing on was not much wider than him. He really is one step away from falling – the makeshift platform is as deep as two of his shoes put end-to-end.
3. There is also no proper anchor point to connect his fall protection to – which really isn't an issue because he's not wearing any fall protection.
4. Finally, if you look down by his heel you can see tape covering the electrical cord of the tool he's using. Very likely covering up some damaged wires. In which case, electrocution is possible, as is getting shocked,

startled, losing his balance, and falling into the unprotected roof opening behind him or falling forward and rolling down the roof.

Roof work is not exempt from fall protection requirements. A fall protection system and/or the use of fall protection equipment should be in use to make this job safe. The damaged electrical equipment should also be placed out of service, repaired, or properly disposed of. Share this with your crews and see what other hazards and fixes they can come up with. ❖



FATALITY FILES

14-Foot Fall with a 15-Foot Rope

A 41-year-old construction worker suffered a severe traumatic brain injury when he fell approximately 14 feet and hit his head on the concrete below. The worker had been installing floor trusses on the second story of a multi-family home when the incident occurred. His foreman and co-worker were on site when it happened and heard, but did not see, the fall.

They found the injured worker lying on the concrete of the home's garage floor, breathing but barely conscious. What else did they find? He was still connected to the rope and harness of his fall arrest system—which was anchored to a beam.

The sad irony of this incident—although the worker was wearing fall protection, the rope was too long, and it couldn't stop his fall. The foreman had warned him about the length of the rope a week before the incident.

The worker suffered multiple skull fractures, brain hemorrhaging, and a fractured spine. A year after the incident, the victim was still in rehabilitation for his brain injuries and required 24-hour living assistance.

Final Word

What could have prevented this incident? Aside from the obvious—using a shorter rope—here are a few more recommendations:



Photo of incident scene showing the opening the worker fell through while installing floor trusses

1. Use an aerial work platform or scaffold where possible—if a work platform had been used in this incident, the worker could have been standing on the platform and not the beam edge.
2. Reduce exposure to falls by placing and securing plywood over the already installed trusses to create a walking/working surface to which an anchor can be secured for a personal fall restraint system.
3. Put in place a disciplinary plan and enforce it. Using the wrong PPE or using the right PPE in the wrong way should be part of the disciplinary plan. It may not always work, but in many cases it could be enough of a deterrent for employees to stop and think before making the same mistake twice.