

Post-fall rescue of workers using fall protection

By John R. Peleaux

In recent years we have witnessed a dramatic increase in the manufacturing and use of fall protection equipment. Combined with proper training, this equipment provides a great step forward in saving lives, preventing injuries and protecting company assets.

With the increased use of fall protection equipment and its successes, one of the next logical concerns is post-fall recovery. The following questions require some serious thought:

- What happens immediately after the fall protection has done its job and the worker is suspended helplessly in a safety belt or harness several feet above safety?
- How are injuries cared for when the patient is out of reach, or inverted in a "safety belt"

Dealing with prolonged suspension

A hypothetical, simple emergency post-fall situation might run as follows: A fall occurs. The worker's fall is arrested safely, with no apparent injuries. He requires assistance. His system includes an I-beam anchorage, shock absorbing lanyard and a full-body harness. What are the consequences of prolonged suspension?

In a 1987 Airforce/OSHA study regarding prolonged motionless suspension, the average amount of time that test subjects could hang motionless in a full-body harness before experiencing nausea, tingling or numbness was 14.38 minutes; in the commonly used "safety belt," 1.63 minutes. These are sobering statistics when one realizes the force of a fall as not even considered.

OSHA Appendix C to Section 1910.66

OSHA plans to develop a generic fall protection equipment standard for general industry in the near future. The separate appendix will facilitate the transfer of fall protection requirements regarding powered platforms

for building maintenance (1910.66, effective 1-24-90) into the general industry standards.

Section I. Paragraph (e) (8) mandatory requirement states: *The employer shall provide for prompt rescue of employees in the event of a fall or shall assure the self-rescue capability of employees.* OSHA comments regarding the ruling state: *The intent of this provision is that the employer evaluate the potential for fall arrest and that rescue support be provided in a timely manner 'to avoid long periods of post-fall suspension. When It Is not possible to evaluate self-rescue capability in advance, prudent employees will need rescue assistance and accordingly be prepared to offer it.*

Post-fall recovery equipment and training

If the belief exists that this "new" concern is just another reason for not using fall protection when fall hazards exist, remember our safety priorities. Before the use of fall protection, post-fall recovery consisted of picking up the fall victim after his contact with the concrete.

At present, a few of the more innovative fall protection manufacturers have produced fall protection devices that incorporate an emergency rescue mode. These devices allow either fellow workers or the fall victim himself to effect the lowering to safety. Additionally, these devices can minimize suspension time, thereby decreasing risk to both the victim and rescue personnel. Pre-use training with these systems is essential for smooth and safe subject recovery.

If full rescue training is not in the budget, but a fire department is just a few minutes away, consider a joint training session at your facility. While your personnel train in rescue hazard awareness, victim communication and fire/rescue team cooperation, the fire department can practice its recovery techniques. Pooling resources with other nearby facilities with fall risks can also reduce training costs.

Planning ahead

- Develop a post-fall recovery plan. Post fire/rescue phone numbers, and plan an easy access route for outside response teams.
- Inventory useful tools (ladders, scaffolds, man-lifts, hoists, rescue winches, etc.) and their location before a fall occurs
- Avoid further injuries and falls by providing fall protection for both rescuer and subject.

- Minimize risk and communication problems by limiting the number of well-intentioned rescuers.

Despite the most conscientious precautionary measures, situations develop that do not fit the "emergency plan." This is when an in-house response team can perform small miracles. If such immediate help is unavailable, the fall victim may be facing a period of prolonged suspension in a full-body harness or safety belt. How would one proceed in this situation?

If a post-fall recovery is needed, the following emergency measures may be activated to protect both the fall victim and intended rescuers. (Several steps could be worked simultaneously.)

- Communicate with the subject, establish the level of consciousness, and evaluate injuries. Comfort and monitor the fall victim continually.
- Call emergency units, ambulance, fire/rescue. It is usually better to have too many rather than too few emergency units at the scene. (This helps deflect the inevitable criticisms of emergency actions after the dust settles.)
- Appoint a qualified person to take charge of the operation's overall safety. This person should be able to look at the big picture, find weak points regarding both subject and rescuer safety, and be able to order changes when needed.
- Evaluate the scene: Can you safely gain access with ladders, man-lifts or hoists? If yes, choose "rescuers" who are moving efficiently, without panic, preferably with first-aid training. Supply them with fall protection. If no, determine the response time for a trained fire/rescue unit. If the response time exceeds 15 minutes, medical attention may become necessary.

Several safe rescue techniques can help both non-injured and injured post-fall victims. They include belaying (protecting the rescuer and subject with rope), aerial traversing, controlled rope descent and mechanical advantage systems. These techniques use a simple and effective safety system to minimize risk; the personnel performing these rescues are usually a small, well-trained in-house group that is also available to management and fellow workers for the correct rigging of fall protection systems. Fire brigades are ideal as they are already emergency response oriented.

The following case histories (from *Industrial Fire World*, June 1989) illustrate the value of having trained teams. The locations of the rescues have been omitted from the original article.

Case Number 1: Tuesday, Jan. 17, 1989

A contract worker at a Texas refinery fell and lodged himself in a pipe rack structure 35 ft. high. The worker sustained a separated shoulder in addition to painful cuts and bruises. A rescue team was called to respond. Coincidentally, the rescue team was in the middle of a rescue training session nearby.

The eight-person team arrived minutes after notification and quickly went to work. The rescuers reached the victim by ladder, stabilized him, and put an extraction harness on him. The team then performed a rope rescue hauling system called the "piggy back," which gave the team a four-to-one mechanical advantage for the lift. Once free of the pipe rack, the team easily converted the hauling system to a lowering system, and with the aid of a tag line, gently lowered the worker to an ambulance gurney for transport to the hospital. This rescue operation began at 11:05 a.m. and was completed in 22 minutes.

Case Number 2: Wednesday, Feb. 2, 1989

At a refinery in Texas, a contract worker suffering from an ongoing kidney ailment had a severe pain attack in his lower back area, effectively doubling him over and rendering him unable to stand or walk. The worker was located in a pipe rack structure 75 ft. above the ground.

Nearby workers tried to bring in a cherry picker to lower him, but deemed that strategy unsafe. The eight-man team was dispatched to the scene. The team quickly packaged the victim in a basket litter, and then incorporated a double lowering line technique to evacuate the victim to the ground. The rescue began at 4:00 p.m., and the ambulance transporting the victim passed through the plant's front gate at 4:21 p.m.

Medical considerations

In most emergency medical situations, accepted teaching stresses the importance of evaluating and stabilizing the subject before moving him. Head, neck and back injuries can be compounded if well-meaning (but untrained) fellow workers move the fall victim incorrectly. During a lowering rescue—unless the subject's airway is obstructed—it is most efficient to carefully lower the victim to within three to four feet of the

ground, and then administer medical care. If the post-fall subject has been suspended in a full-body harness for more than 15 minutes, the rescue team should be aware of the possibility of delayed shock symptoms occurring even one hour after rescue.

While hanging in a harness or safety belt, circulation to the legs may be cut off. During this time, the blood in the legs may pool and develop a buildup of lactic acid and other biochemicals. The sudden release of pressure from the harness straps causes the blood from the legs—with its chemical buildups—to surge through the body, prompting a physical reaction that can lead to delayed shock symptoms. As a precautionary measure, the rescued subject should be placed in a prone position and monitored for a few hours.

Conclusion

“We don’t need a safety director; we have a good insurance policy.”

--*Telephone quote—construction company*

It is evident how much value this company places on employee safety, health and well-being. Successful companies realize employees are the company, and not simply an expendable resource.

As with fall protection installation, confined space entry and post-fall recovery, preplanning is the key ingredient to a safe and cost-efficient operation. With the value of human life being dictated by soaring insurance, litigation and medical costs, preplanning and prevention has become very cost effective.