



SAFETY SERVICES  
COMPANY

WHITEPAPER

# Avoiding Fall Protection Pitfalls



# When Working Over Dangerous Equipment and Machinery Fall Protection Must Be Provided

Excavation and trenching are among the most hazardous construction operations with cave-ins posing the greatest risk. In addition to the possible loss of life and injury, falls are costly to employers. Liberty Mutual recently estimated that on an annual basis fall related incidents cost employers in the U.S. nearly \$100 billion. Remember, when working over dangerous equipment and machinery fall protection must be provided.

## Basic OSHA Fall Protection Regulations

To protect against the possibility of injury and death, fall protection must be provided at 4 feet in general industry, 5 feet in maritime and 6 feet in construction. However, regardless of the fall distance, fall protection must be provided when working over dangerous equipment and machinery.

OSHA has a long list of regulations and requirements designed to protect employees and employers from the risks associated with falls. These regulations include hazard assessments, hazard elimination, fall protection systems, training and more.

Meeting these training standards is proven to significantly reduce the possibility of fall incidents at the workplace



## Falls Cripple Employees and Companies

In the U.S. construction industry, falls are the leading cause of worker fatalities. Each year between 150 and 200 workers are killed and more than 100,000 are injured as a result of falls.

It is not a phenomenon contained to the construction industry. Based on data from the National Institute for Occupational Safety and Health (NIOSH) National Traumatic Occupational Fatalities (NTOF) Surveillance System, falls from elevations were the fourth leading cause of workplace death from 1980 through 1994 with falls from elevations accounting for 10% of all occupational fatalities during this period, an average of 540 deaths per year. [3]

In fact, the 2010 Liberty Mutual Workplace Safety Index indicates falls were the leading cause of all workplace injuries in 2008. [2] Across all industries the main agents for major injuries are ladders. [1] The problem is not improving.

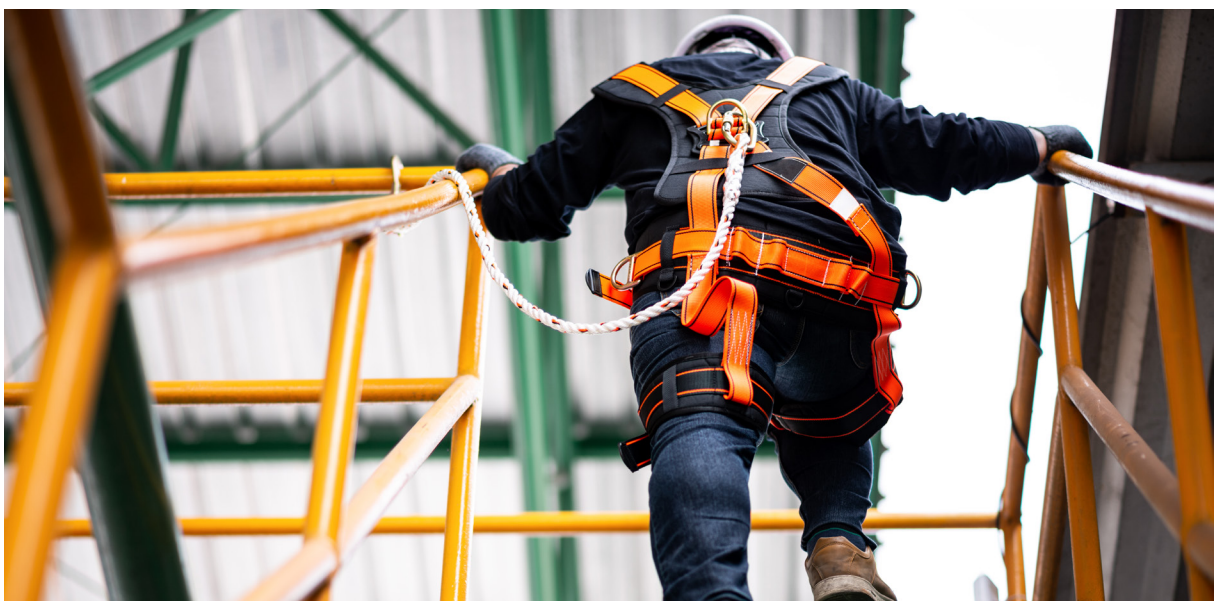
## Liberty Mutual's Index

Liberty Mutual's index indicates that between 1998 and 2008 all fall related incidents experienced a 50.6 percent growth rate. More troubling is in this time frame most other causes of workplace injuries experienced a substantial reduction in their rate of growth. [2]

In terms of cost of fall injuries Liberty Mutual's study concludes falls account for 25.6 percent of direct costs associated with injuries, or more than \$13.67 billion annually. [2] Additionally, the National Safety Council (NSC) estimates workers' compensation and medical costs associated with employee fall accidents are approximately \$70 billion per year.

Loss of productivity is another side effect of falls. On average, an injured worker spends more days away from work (median: 8 days) than those who are injured as a result of other causes (median: 6 days). Most troubling, nearly 30 percent of falls result in more than 21 workdays lost.

A further cost is those of claims. Workplaces who have no fall protection policy in place open themselves to a potential lawsuit from an employee involved in a fall incident. For example the QBE insurance group estimates the financial costs associated with a young person who is rendered quadriplegic from a fall can run millions of dollars. As can be expected the severity of falls from height is more significant than other workplace accidents. The group further estimates the average employer loss resulting from a fall claim to be \$24,000. [1]





### Regulations to Protect Your Company and Employees

OSHA recognizes accidents involving falls are complex and generally involve several factors. To deal with the myriad issues responsible for falls, the government organization has created a system of multi-layered regulations to cover both the human and equipment-related issues in protecting workers from fall hazards. These regulations deal with proper use and installation of safety systems, supervision, safe work procedures, maintenance and more.

Here is a look at those regulations;

- **1910.23 Guarding floor and wall openings and holes.**  
This standard and its subparts cover workplace walking and working surfaces. The standard states that you are to provide guardrail protection around holes and other floor openings. The floor openings may include ladder ways, open chutes and hatches.
- **1926.500 Fall Protection Requirements in Construction Workplace**  
These regulations and subparts define requirements and criteria for fall protection in construction workplaces. The section identifies those workplaces, conditions, operations, and circumstances for which fall protection shall be provided and the type of equipment that must be provided.
- **1926.501 Duty to Provide Fall Protection**  
This regulation sets forth requirements for employers to provide fall protection systems. Individual employers are required to determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely.
- **1926.502 Fall Protection Systems Criteria and Practices**  
This regulation and its subparts requires employers to provide for all employees any and all fall protection systems. The regulation also requires the employer installs all fall protection systems before any employee begins the work that necessitates the fall protection.

## Categories of Fall Protection Equipment

The value of training is further emphasized by a study of 41 workers hospitalized for hand injuries. Through the survey of these employees conducted by members of National Institute for Occupational Safety and Health (NIOSH) it was discovered more than half had no on-the-job training for the equipment that caused their injury.

Workplaces that establish safety and health management systems can reduce their injury and illness costs by 20 to 40 percent, according to OSHA. Studies not only show the impact safety training has in increasing productivity and preventing injury. It shows the value training has to prevent casualties. [7] A NIOSH study of 55 confined workplace fatalities found that only three of those losing their lives ever received training on the proper workplace safety procedures.

### Fall Arrest

A fall arrest system is required if any risk exists that a worker may fall from an elevated position, as a general rule, the fall arrest system should be used anytime a working height of six feet or more is reached.

Working height is the distance from the walking/working surface to a grade or lower level. A fall arrest system will only come into service should a fall occur. A full-body harness with a shock-absorbing lanyard or a retractable lifeline is the only product recommended. A full-body harness distributes the forces throughout the body, and the shock-absorbing lanyard decreases the total fall arresting forces.

### Positioning

This system holds the worker in place while keeping his/her hands free to work. Whenever the worker leans back, the system is activated. However, the personal positioning system is not specifically designed for fall arrest purposes.

### Suspension

This equipment lowers and supports the worker while allowing a hands-free work environment, and is widely used in window washing and painting industries. This suspension system components are not designed to arrest a free fall, a backup fall arrest system should be used in conjunction with the suspension system.

### Retrieval

Pre-plan for retrieval in the event of a fall when developing a proactive fall management program.

### There is a Better Solution

As North America's largest supplier of safety training materials we are able to offer safety compliance solutions and products that will not break the bank. Our "Do-It-Yourself" Fall Protection Kit. This innovative kit features an Interactive Training Program, Student's Handbook, Instructor's Handbook, OSHA Regulations, Student Tests, Training Logs, Fall Protection Checklist, Certificates, Wallet Cards and More.

Topics addressed in the kit include:

- OSHA requirements
- Accident Prevention
- Fall hazard analysis
- Definitions
- Training requirements
- Fall protection systems
- Personal fall arrest systems
- Employee responsibilities
- Warning lines





## Subparts

Specific subparts of the regulation cover the following types of fall equipment and fall protection tools:

- Permanent guard rail and portable guardrail systems
- Safety netting and safety net systems
- Personal fall arrest systems

These regulations also define and give performance criteria for Personal Protective Equipment as part of a fall arrest system.

### 1926.503 Fall Protection Training Program

This regulation details the requirements you must provide in a training program for employees exposed to fall hazards. The training program must teach employees to recognize the hazards of falling and shall train each employee in the procedures to be followed in order to minimize these hazards. The employer is required train each employee in the following areas:

- Fall hazards in the work area.
- Procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used.
- Use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and any other fall protection that employee will use.

## Prevent Injuries and Increase Productivity

While the blow of a workplace injury is crippling to many companies, safety training programs are proven to drastically reduce the risk of injury and increase workplace productivity. Through independent studies, OSHA has confirmed employers who have in place a safety and health training program experience a 52 percent lower rate of "injury with days away" than employers without a program. [4] A second study of private industry employers by OSHA found even more benefits to a safety training program.

Here are a few highlights of those programs:

### Company Benefits

- Average Sales rose 7.5 percent
- Manufacturing defects and waste dropped from \$2.7 million in 2001 to \$435,000 in 2005
- Improved decision-making
- EMR dropped by 45%

### Safety Leads to Big Reductions in Indirect Costs

- Increased productivity
- Higher quality products
- Increased morale
- Better labor/management relations
- Reduced turnover
- Better use of human resources



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## Fall Protection Systems

Listed below are the types of fall safety equipment and their usage

- Class 1 – Body belts (single or double D-ring) are designed to restrain a person in a hazardous work position and to reduce the possibility of falls. They should not be used when fall potential exists; positioning only.
- 2nd Class – Chest harnesses are used when there are only limited fall hazards (no vertical free fall hazard), or for retrieving persons such as removal of persons from a tank or a bin.
- Class 3 – Full body harnesses are designed to arrest the most severe free falls.
- 4th Class – Suspension belts are independent work supports used to suspend a worker, such as boatswain's chairs or raising or lowering harnesses.
- Rope Lanyard – Offers some elastic properties for all arrest; used for restraint purpose.
- Web Lanyard – Ideal for restraint where fall hazards are less than 2 feet.
- Cable Positioning Lanyards – Designed for corrosive or excess heat environments and must be used in conjunction with shock absorbing devices.
- Shock Absorbers – When used, the fall arresting force will be greatly reduced if a fall occurs.
- Rope Grabs – A deceleration device which travels on a lifeline, used to safely ascend or descend ladders or sloped surfaces and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee.
- Retractable Lifeline – Gives fall protection and mobility to the user when working at height or in areas where there is a danger of falling.
- Safety Nets – Can be used to lessen the fall exposure where temporary floors and scaffolds are not used and the fall distance exceeds 25 feet.
- Rail Systems – When climbing a ladder, rail systems can be used on any fixed ladder as well as curved surfaces as a reliable method of fall prevention.

### Continuing Commitment

Your purchase from Safety Services Company not only makes you a valued customer, but also a member of the Safety Services Network. As a member of this exclusive group we pledge to continually monitor the ever changing safety requirements in your specific field and contact your company when a change may occur. We are also available to answer questions on your purchase, or any other available materials via e-mail or phone.

All certification through the program meets or exceeds OSHA requirements. In addition to meeting training requirements, the kit provides instruction on how to craft your scaffolding written policy. If you are not comfortable writing your own policy we can provide the service for an additional fee. Remember, when working over dangerous equipment and machinery fall protection must be provided.

Call (877) 751-1541 today to speak with one of our safety solutions experts.



## Citations

- [1] <http://www.qbeeurope.com/documents/casualty/risk/issues/Working%20at%20Height.pdf>
- [2] Liberty Mutual 2010 Workplace Safety Index
- [3] <http://www.cdc.gov/niosh/topics/falls/>
- [4] [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=standards&p\\_id=10051](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10051)
- [5] <http://www.labor.state.ny.us/workerprotection/safetyhealth/PDFs/WSLP/Cost%20Benefit%20Safety.pdf>
- [6] <http://www.osha.gov/Publications/smallbusiness/small-business.pdf>
- [7] <http://www.osha.gov/Publications/safety-health-addvalue.html>

This publication does not itself alter or determine compliance responsibilities, which are set forth in OSHA standards themselves and the Occupational Safety and Health Act. Moreover, because interpretations and enforcement policy may change over time, for additional guidance on OSHA compliance requirements, the reader should consult current and administrative interpretations and decisions by the Occupational Safety and Health Review Commission and the Courts.



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