

Do You Have A Fatal Fall Protection Program?

**Robert Whitfield, CSHM
Fall Protection Program Administrator
Honeywell Technology Solutions Inc.
Columbia, MD**

Introduction

Late one afternoon in 2005 I received the phone call that every safety professional fears. An employee had fallen while descending a tower and had died at the scene. After the initial shock dissipated, I started the notification process and waited for additional information to filter in. While waiting I started to play 20 questions on what could have happened. Did the employee have on his fall protection equipment? Had he anchored off correctly? Had he followed our safety procedures? Was he familiar with the tower and its hazards? The answer to these and many others were all yes. Our Corporation had a good fall protection program that met current OSHA guidelines so what went wrong? Over a year later OSHA agreed, our Fall Protection Program was compliant and not at fault.

As part of our Corporations recovery from this tragic event an internal “Green Belt” team consisting of experienced climbers, instructors, and management was formed. Here are the “top 10” areas that we decided to take a second look at, apply the best fall protection safety practices available globally and in that process strengthened our overall program to a level that even our parent corporation was mandated to adopt.

1. Review your Fall Protection Program often

Review your Fall Protection Program on an annual basis. Regulations, procedures and task requirements may change and reduce the effectiveness of your program. Search out industry “Best practices” and incorporate those that apply. Make fall protection part of your normal Management of Change Process.

During that year while OSHA investigated, we took a hard look at not just our current fall protection program but the tasks our employees were really being asked to perform. Our Corporation got into the climbing business gradually. First it was some roof top work, then some tasks on antennas, and finally tasks performed on towers. Since it was so gradual, few noticed that our tasks aloft had increased and changes in our program may have been needed. OSHA was at a loss for suggesting improvements but our mandate was clear. We needed to go beyond current OSHA requirements to protect our employees. The generic Fall Protection Program we had built years before no longer had enough detail and depth for the tasks we performed. In response, we adopted a Managed Fall Protection Program based on the new family of ANSI Z359

-2007 standards. These standards are the bedrock that our Fall Protection Program is now built on.

Building and incorporating a Managed Fall Protection Program into our corporation required major changes. The simple program that had been placed within the corporations “Walking, Working Surfaces Policy” now became a stand alone program, with its own administrator and leadership responsibilities. Supervisors now had to identify and provide funding for the training of qualified, competent and authorized personnel. An expanded training and documentation program which presented new specific policies and directives for “Basic Fall Protection” and “Towers & Antennas” became a reality. Once an employee is required to use fall protection equipment (work above 6 feet) and/or comes under our corporations Fall Protection Program requirements, it is said that an employee is “working at height.” We adopted this phrase to differentiate from tasks performed below 30 feet in height. A Fall Protection Committee, composed of certified fall protection instructors and climbers, was established and now meets monthly.

2. Documentation can provide additional protection

Create appropriate documents that protect your workers by mandating leadership review and approval of tasks being performed.

Here are examples of three documents that evolved out of our attempt to build a stronger fall protection program:

Work at Height Permit - Work at height permits are completed and approved (per site requirements) prior to the start of any work at height. They perform a function similar to a Burn Permit. The permit provides basic information such as location, employees assigned to the task and a brief description of the actual work which will be performed. Included in the permit is emergency contact information, task specific safety precautions, mandated Personal Protective Equipment (PPE), authorization block and the time frame for which the permit is valid. Actual risk ratings for the task are placed into the permit along with any other information that may affect the safety of climbers and bystanders. The permit must be reviewed and approved by site or program leadership which makes that person accountable for the overall safety of the task. One copy of the permit and the site or task specific rescue plan is available at the job site whenever an employee is aloft.

Rescue Specific Job Hazard Analysis - This is a Job Hazard Analysis (JHA) form designed to identify rescue related hazards that may be encountered during the performance of a task and preventative measure that should be taken to reduce or eliminate a fall. This form also provides a ready list of equipment that must be available during the task to provide rescue support if a fall should occur.

Roof Access Work Permit - This permit provides basic information such as location, employees assigned to the task, and a brief description of the actual work which will be performed. Included in the permit is emergency contact information, task specific safety precautions, (barricades, skylight covers, Controlled Access Zone (CAZ) requirements, etc.), mandated Personal Protective Equipment (PPE), authorization block and the time frame for which the permit is valid.

3. Find out where and what your workers are climbing on

Perform a comprehensive survey of all tasks to reveal existing or possible fall protection hazards. Photo document structures when possible.

During our investigation, we learned that we had over 100 more structures being climbed by our personnel than originally known. We learned that many of these structures had not been formally inspected for unsafe conditions in over 10 years. Some had never been formally inspected since their construction. An accurate baseline on the structures climbed and tasks performed at height is needed to ensure you can eliminate or manage fall hazards appropriately. Questions to ask:

- What type of structures do your employees climb on (roof top, towers, antennas, masts, vehicles, ships, etc.)?
- At what heights are they routinely climbing and performing tasks?
- When were these structures last inspected and by whom?

Our corporation mandated that every structure our employees would climb, over 30 feet tall, be certified in writing that it was indeed safe to climb. Many of our customers balked at this requirement and we had to make the hard choice between performing a task or turning it down until the structure had been inspected. At a few locations, our corporation paid for outside experts to conduct site inspections to ensure that towers, antennas and supporting structures were safe to climb. A large portion of our customers were not aware of their responsibilities as owners of these structures and had consistently placed their own employees at risk. We tactfully explained OSHA's requirements and how their "General Duty Clause" related to not only our personnel but their employees as well. Our pre-climb worksheets now require verification that a "Safe to Climb" letter be on file and available for review by our employees. Our climbers have the ability to stop a climb at anytime they believe a structure or task is unsafe, and a process to report these to our management.

4. Risk Identification and Risk Rating

An assessment to identify "work at height" performed by your company or organization, that poses hazards to employees, contractors, or the general public, should be performed by a competent person. Each risk should be "rated" to determine your most hazardous tasks.

When the risk of a fall from "work at height" is identified, a hazard identification and risk assessment should be documented for the task(s) and the following hierarchy of risk control measures should be applied (in descending order) to either eliminate the risk or reduce the risk of a fall to as low as reasonably practicable. Only where it is not reasonably practicable to use a higher order control should you then use a control at the next lower level:

- Elimination
- Passive Fall Protection
- Work Positioning System
- Personal Fall Arrest System
- Administrative Controls

Part of our pre-task process involves the identification of hazards and applying an appropriate “Risk Rating” to the task. A JHA is completed the first time a task on a tower or elevated structure is assigned. Details provided by the JHA are used to complete an actual risk rating of the task. A “Work at Heights Risk Matrix” is used for this purpose. Elements considered are:

- Height of structure (0-6’=1, 6’-25’=2, 25’-30’=3 & 30’ and higher=4)
- Time (minutes) at height (0-15=1, 15-60 =2, 60-480=3 & 480 and longer=4)
- Activity at height (Light work=1, Medium work=2 & Heavy work=3)
- Frequency (Yearly=1, Quarterly=2, Monthly=3, Weekly=4 & Daily=5)

A combined total of each elements score will provide your risk rating number. The ratings are then placed into a Work at Height Permit along with any other information that may affect the safety of climbers and bystanders. Work at height permits are completed and approved (per site requirements) prior to the start of any work at height. One copy of the permit and the site or task specific rescue plan should be available at the job site whenever an employee is aloft.

5. Training

Fall protection training must be comprehensive, easy to understand, retainable by the employee and useable for the tasks he or she may perform. Your Fall Protection training program should be evaluated annually and updated as the industry matures.

When the American National Standards Institute (ANSI) issued ANSI/ASSE Z490.1-2001, Criteria for Accepted Practices in Safety, Health, and Environmental Training, they provided a useful tool to evaluate your Fall Protection training program. This standard established criteria for safety, health, and environmental training programs, including development, delivery, evaluation, and program management. Your goals in instruction should be:

- To include course goals and objectives so they know what’s coming
- Design active audience involvement in the learning process whenever possible.
- Include open-end questions and exercises.
- To use the “Buddy System” during harness donning exercises to engage participants to self-correct themselves and others.
- Involve experienced climbers who have usable examples of best practices
- Always teach at the Adult learner level.
- Conduct pre-testing to set the level of experience within your class and post-testing to evaluate the understanding of new material and quality of course material and presentation style.

The following is a brief synopsis of our current Fall Protection Training:

Basic Fall Protection

Designed for those employees who may work at heights, this 4 hour course teaches students how to safely perform work-at-height and support rescue activities. The course also includes an overview of the HTSI Managed Fall Protection Program, how to work with the competent person to safely pre-plan work and rescue; perform a fall hazard survey; review fall protection equipment

manufacturer instructions; properly select, use, maintain, and store fall protection equipment; anchorage and clearance verification; OSHA Regulations and ANSI Standards.

Certified Tower Climber

This course of instruction is for employees who perform tasks that require them to climb towers, antennas, or other structures over 30 feet off of the ground. This 6 hour course is designed to provide practical “Hands On” training for employees who are tasked to climb towers and antennas. The purpose of this course is to increase their safety awareness and prevent injury or death of our employees. The course also includes how to perform tower/antenna hazard identification, complete required documentation, inspection and maintenance of personal fall arrest systems (PFAS), practical applications of safety procedures and control measures, rescue planning and rescue operations. Participants in this course will train on, and then use, an automated self-descender to lower themselves from an elevated structure. This course encompasses the latest OSHA Regulations and ANSI Standards. A medical clearance is required to complete this course.

Managed Fall Protection Trainer

This course is designed for competent persons responsible for training in-house personnel to the level of competent person, this customized 6-8 hour course instructs students how to teach our curriculum to an in-house team. Students should learn how to teach the competent person subjects, how to develop customized case studies and how to interpret adult learning styles and personality profiles. This course will also assist students to develop classroom learning and retention activities. The completion of a Basic Fall Protection training course is a pre-requisite to take our Trainer Course.

To ensure your Fall Protection training program is conforming to ANSI/ASSE Z490.1-2001, an evaluation strategy to measure results of training of the employee and the organization is required. Training should include methods to evaluate:

- Employee reaction to training
- Knowledge and skills gained during the training
- Application of the knowledge and skills in the workplace
- The impact of training on your organization

6. Rescue Planning

Site Rescue plans should formally lay out what specific actions will be taken if a climber falls while working at height. Rescue plans should be tested and reviewed annually.

During our review of our Fall Protection Program, we learned that the local rescue departments who previously offered to assist in rescue operations could no longer provide the quick response we required. In fact many could not even reach the heights at which we operated. We learned that many of the rescue plans our sites maintained had been reviewed but had never been actually tested.

Presenting a post-fall rescue scenario should be an integral part of pre-climb planning by making rescue situations a planned event rather than a chaotic event. Part of that pre-planning process also entails thinking about potential safe places for rescue, whether a worker should be

lowered or raised to safety, other aspects of workplace geometry and how that's going to affect rescue efforts. The workplace geometry should include considerations such as what kind of obstructions are in the worker's fall path and whether a worker would have a clear path in the event of fall.

Prompt rescue, as required under 29CFR 1926.502(d)(20), is not defined in the formal standard. The particular hazard that 29CFR 1926.502(d)(20) addresses is being suspended by the fall arrest system after a fall. While an employee may be safely suspended in a body harness for a longer period than from a body belt, the word "prompt" requires that rescue be performed quickly and in time to prevent serious injury to the worker.

Our corporations' policy now mandates that emergency rescue of a suspended climber must be started and in progress within 15 minutes! By following a prepared and tested plan, you will not miss important steps which could lose valuable time, and place the fallen worker in additional risk. Trying to adjust your plan while under the pressure of rescue operations may lead to less than ideal results. Rescuing a suspended worker presents unique logistical challenges, such as high elevations and access-impeding obstructions which can seriously delay emergency personnel.

When building your Rescue Plan, consider and incorporate any site-specific requirements and/or support (ladder truck, rescue helicopter, etc.) that may be available. Local emergency numbers, police, security, fire & rescue should be included when available. Key contact names should also be inserted into your plan if available.

Our corporations' policy mandates that appropriate measures and pre-planning take place to complete a safe rescue of a suspended climber. In locations where emergency personnel or specialized equipment is not available within 15 minutes, the use of an emergency descent system is mandated. All certified climbers are trained on their operation and use to successfully complete our Certified Tower Climber Course. Only approved rescue equipment may be utilized during tasks at height performed by our personnel.

7. Climber certification process

Only individuals with the appropriate experience, skills, and training should be designated to perform installation or service operations at heights.

All employees, designated under a fall-protection program, should be trained and instructed in the following areas as a minimum:

- The proper anchoring and tie-off techniques for the structures they climb on.
- How to recognize the fall hazards in their work area
- To avoid fall hazards by using established work practices, which have been made known to the employee
- To recognize unsafe practices or working conditions that could lead to a fall such as windy conditions or uncovered skylights.
- To be aware of one's physical ability to perform operations at height and not exceed one's personal physical capabilities
- How to wear, use, inspect and store their Personal Fall Arrest System correctly.

- Rescue operations and site specific procedures

8. Medical Requirements and Testing for Climbers

The rationale for the use of medical protocols is to determine if there is any underlying medical problem that would cause difficulty in performing the essential function of the task while at height. Overall physical strength and especially strength in the arms is essential for a climber.

Because working at heights involves dangerous activities that are directly affected by the physical conditioning, stamina and health of an employee more than most work related activities, we have decided to evaluate Tower Climbers at both the medical and physical conditioning level. Tower climbers are currently evaluated for physical conditioning during their classroom instruction using an approved method in our program. Currently no job description in my company lists tower climbing as an essential function of a job. This is considered as a voluntary action and employees may refuse the additional medical testing that is required. Listed below are the current protocols we follow for this course of testing:

Contents of Tower Climber Medical Examinations:

- History and physical
- EKG
- Blood chemistries: to include at a minimum, measures of sodium, potassium, calcium, glucose, thyroid function, cholesterol, liver and renal function.
- Pulmonary function studies
- Sub Maximal Step Test (Timed Stamina Test) for the determination of minimum fitness level as part of a performance based standard for climbing tasks.
- Vision, near and far, minimum 20/25 (with appropriate correction)

Tower Climber Medical and Physical Testing Age Requirements:

- 40 years old and under– Baseline testing (pre-employment physical & drug testing) must be completed
- 41 years old and above – Testing (Climbers Physical) will be performed every 3 years
- All ages – Testing may be performed as needed for significant changes in body condition, such as significant weight change, body strength, or disease

All medical information should be considered confidential and access to this information should be restricted to only the employee and any authorized medical staff member who need it in the performance of their duties.

9. Equipment Approval/Oversight

The type of fall protection equipment most suitable for your tasks should be determined by a Competent Person and your Fall Protection Program Administrator.

Even though equipment manufacturers build and test their fall protection harnesses and support devices to an approved standard, every manufacturer builds products in their own way. .

OSHA's 1926 Subpart M, Appendix C, II (b) Personal Fall Arrest Systems-Non-Mandatory Guidelines for Complying with 1926.502 (d) states that "Before purchasing or putting into use a personal fall arrest system, an employer should obtain from the supplier information about the system based on its performance during testing so that the employer will know if the system meets this standard. Testing should be done using recognized test methods".

It should be the role of the Fall Protection Program Administrator and your designated competent persons to determine which equipment is appropriate for specific tasks. The purchasing of fall protection related equipment should only be approved by these individuals. A purchasing agent may find a great deal on \$10.00 carabineers but may not know the actual holding or locking requirements needed. A \$40.00 harness can be very inviting to a supervisor who does not want to buy the \$120.00 "approved" version. Your process to purchase all fall protection equipment should be formally documented, approved by your leadership and mandated to all purchasing representatives and supervisors.

10. Post Rescue Medical Protocols

Once a rescue has been completed, there are medical considerations unique to harness suspension trauma that must be taken into account

In March 2004, OSHA issued a safety and health bulletin (SHIB 03-24-2004) outlining the dangers of prolonged, upright suspension. The bulletin warned of the risk of "orthostatic intolerance" and "suspension trauma," which refer to some of the potential health hazards – death being the chief one – experienced by workers who are suspended upright by fall arrest equipment after a fall

Once a rescue has been completed, there are medical considerations unique to harness suspension trauma that must be taken into account. This is certainly one of those nontraditional EMS environments that responders may have no knowledge about and unfortunately fall back upon routine procedures which could prove deadly to their patient. Contrary to most first aid treatment for trauma and shock, do not allow the victim to fully recline after the rescue is completed. Rescuers should be advised against moving the rescued worker to a horizontal position too quickly, which is likely to cause a large volume of de-oxygenated blood to move to the heart, if the worker has been suspended for an extended period. This can result in death when the trapped blood volume is suddenly released. We recommend placing the victim in a sitting or kneeling position for at least 45-60 minutes. **Horizontal or reclining positions should not be attempted until the victim reaches a hospital under the supervision of a physician.**

It is extremely important to notify the medical evacuation personnel and emergency room personnel of the risks of placing the victim in a horizontal position, as all trauma victims are normally transported in a horizontal position; *however*, medical personnel must make the final decision as to how to transport the victim. . Always have the fallen employee medically evaluated, even if he appears to be uninjured, as some symptoms of harness suspension trauma do not manifest themselves immediately. If the body's reaction to this trauma is advanced or the climber has lost consciousness, urgent transport to a trauma center is immediately required. Due to the remote location of some of our worksites, my corporation is in the final stages of releasing draft suspension trauma directives/protocols for emergency crews and hospitals to review and hopefully adopt.

Summary

Fall-protection systems, plans, and procedures are all required to protect personnel from the hazards and potential for injury resulting from falls. Fall-protection systems can range from the implementation of administrative measures (procedures) to engineering controls and the use of highly specialized equipment. Hazards associated with activities being performed at elevated locations must be reviewed constantly and evaluated to determine the correct level of protection necessary for the safety of your workers. Failure to do so will allow the acceptance of risks to become the norm and may lead to your company and its employee's reliance on a "Fatal Fall Protection Program."