LIGHTEN UP
WORKERS NOT ALWAYS USING THEIR FALL PROTECTION EQUIPMENT? HOW COMPANIES CAN IMPROVE WORKER SAFETY HARNESS COMPLIANCE

By: Tim Thompson, Product Manager

Despite alarming statistics that indicate falls from height remain the number one cause of death in the construction industry—accounting for more than 36 percent of all work-related deaths in 2013, according to the Occupational Safety and Health Administration (OSHA)—many workers continue to avoid using proper fall protection equipment, including their safety harness, each and every time they work at height.

Year after year, the number one most frequently cited OSHA violation is the lack of proper fall protection, indicating that the compliance challenges employers have experienced in the past will continue to be the challenges they will deal with in the future, unless something radically changes in the industry.

THE HIGH COST OF WORKER NONCOMPLIANCE

When workers choose to work at height without wearing their harness, even during a task that takes just a few minutes or occurs at a low height, the risks—and costs—can be enormous.

Fall-related injuries and deaths can be devastating on a physical, emotional, and financial level for the worker, the worker’s family, and the company. In addition to the loss of life or injury, a fall can easily cripple or bankrupt a business.

According to the American Society of Safety Engineers (ASSE), more than $40 billion in workers’ compensation benefits is paid every year by employers and their insurers—nearly $500 per covered employee.

So getting workers to wear their safety harness and use their fall protection equipment is crucial.

TRADITIONAL METHODS COMPANIES HAVE USED TO INCREASE WORKER COMPLIANCE

To reduce the number of injuries and deaths caused by falls from height, fall protection manufacturers, safety consultants, regulatory agencies, and construction companies have dedicated enormous resources to encourage worker compliance, including:

• developing safer fall protection harnesses
• offering improved fall protection training
• enforcing stricter standards and regulations
We need protection because even those of us with experience working at heights can lose our balance or grip; we can slip, trip, or misstep at any time.

SAFER FALL PROTECTION HARNESSES

One way to encourage workers to use their personal fall arrest system when they work at height is to develop safer harnesses.

Harnesses have greatly evolved since the early 20th century. The first at-height protective gear included body belts worn around the waist to protect utility linemen during pole climbing; although better than no protection, body belts could cause spinal and midsection injury from transmitted fall arrest forces; workers could also slip out of the belt during a fall.

By the 1940’s, the first full-body harness was developed based on military parachute harnesses used by paratroopers; the harness was much safer and more effective than the body belt, but heavy materials such as leather and cotton, as well as bulky construction, made the harnesses uncomfortable for workers to wear.

Safety harnesses have continued to evolve, using designs based on recreational harnesses and receiving input from mechanical engineers and industrial designers to improve safety and ergonomics. Depending on the manufacturer, current full body harnesses can include such features as additional back lumbar support, positioning rings, tool carrying options, and specialty materials and construction offering fire resistance or arc flash protection, and can protect workers in even the most precarious work situations.

However, even with the development of much safer full body harnesses, achieving worker compliance remains challenging. According to Oregon OSHA’s Fall Protection for the Construction Industry, “We need protection because even those of us with experience working at heights can lose our balance or grip; we can slip, trip, or misstep at any time. We may think that our reflexes will protect us, but we’re falling before we know it, and we don’t have to fall far to be seriously injured. We’ve been falling since Day One. Until we get better at landing, we’ll need protection from falling.”

IMPROVED FALL PROTECTION TRAINING

In addition to offering safer equipment, training workers on how to correctly use that equipment increases the likelihood that they will.

Comprehensive fall protection training, fall arrest training, and industrial rescue courses offer companies the right kind of training for their particular trade or unique industry’s work environment. Training is also offered in a variety of formats, including on-site demonstrations and hands-on experiences, video and online training, and specialized training customized for the work site.
The more informed and prepared workers can be about the hazards of working at height, how to properly use personal fall arrest systems, and how to avoid falls, the more likely workers are to comply and to safely work at height.

However, even though fall protection training is available at a variety of price points and levels of customization, workers are not always as prepared as they could be. According to occupational safety and health magazine EHS Today, “Unfortunately, many training programs rely on a worker watching a video and signing a roster.”

**Enhanced Fall Protection Regulations and Standards**

Developing standards for and enforcing the use of fall protection equipment—for both employers and workers—is another way to improve worker compliance. OSHA first published fall protection measures for general industry regulations in 1971; fall protection regulations have continued—and will continue—to be a priority for OSHA.

As important as legal regulations are to the industry, Thomas E. Kramer, president of the International Society for Fall Protection, says, “One of the most important steps to increasing safety for workers at heights is for workers to take personal responsibility for their own safety, rather than having safety imposed upon them.”

**Why Is Worker Compliance Still So Challenging?**

Every one of the above initiatives has helped; each has been a crucial piece of the puzzle in improving worker compliance while working at height.

But the question remains: if safety harnesses and fall protection equipment save lives, why aren’t workers consistently using them?

As yearly statistics continue to show, getting workers to use their fall protection equipment—every single time while working at height—is still a huge challenge. No matter how safe fall protection equipment is or how thorough the education, trainings, and regulations, if the equipment isn’t being used, the worker remains at risk.

So Capital Safety resolved to find out why—and to come up with a solution.

Capital Safety began its research by having in-depth conversations with workers in the field, safety managers, and ergonomics specialists. Over and over, Capital Safety heard the same three major complaints; according to experts, employers, and workers, safety harnesses:

1. are too heavy and uncomfortable when they are loaded with tools and gear
2. are too hot
3. get in the way of doing the job

Clearly, it was time for the modern-day safety harness to evolve.

**A Radical Solution to Worker Compliance: Engineering a Harness Workers Want to Wear**

For decades, the primary focus of safety harnesses and worker compliance was to protect workers from falls, while comfort and worker productivity got pushed to the backburner.

Over the past 30 years, Capital Safety has helped shape and define what the modern safety harness looks like and how it performs. As a result of this most recent feedback about harness comfort, Capital Safety was determined to pioneer a safety harness that was comfortable enough for workers to want to wear it all day long.

But the reality is, most manufacturers already say their harnesses are ergonomic and comfortable.

So Capital Safety set out to test the ergonomics of leading full body harnesses—and to improve them—first by engineering a revolutionary new harness called the ExoFit STRATA™ based on the undeniable day-to-day needs of workers, and then by stringently testing the technology to see how well it actually performed.

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PROOF OF HARNESS ERGONOMICS

In July 2015, Capital Safety partnered with ergonomics specialists from the H.C. Sweere Center for Clinical Biomechanics and Applied Ergonomics at Northwestern Health Sciences University to better understand the impact a harness has on the body. They did this by testing Capital Safety’s new DBI-SALA ExoFit STRATA harness compared with full body safety harnesses designed by other leading manufacturers.

In this study, subjects were each fitted with two or three harnesses according to manufacturer specifications. Force readings were then taken during standing, forward bending (as if picking up an object from the floor with two hands), reaching upward, rotation, and lateral bending.

Researchers looked at several key factors affecting worker comfort, including:

- loads on the shoulders of harness wearers during flexion, rotation, and lateral bending
- range of motion in flexion, rotation, and lateral bending
- skin temperatures on the back during harness wearing

During the study, a series of rigorous lab tests were performed using thermal sensors, load cells, and motion capture cameras to see how leading harnesses performed, including the DBI-SALA ExoFit STRATA harness.

HARNESS TECHNOLOGY THAT REDISTRIBUTES THE HEAVY WEIGHT LOAD

A worker at height often carries 50 pounds or more of tools and equipment, and the weight load can be extremely taxing on their shoulders and backs with the potential to cause back injury and strain, even while simply standing.

The DBI-SALA ExoFit STRATA harness was designed with weight-distributing technology to take the weight off workers’ shoulders and redistribute it down to their hips, around their center of gravity.

During the H.C. Sweere Center testing, the DBI-SALA ExoFit STRATA harness clearly demonstrated the least amount of force on the shoulders; while standing stationary, the ExoFit STRATA reduced forces on subjects’ shoulders up to 85% compared to competitive harnesses like the Miller® AirCore™ and FallTech® FlowTech®.

LIFTECH™ LOAD DISTRIBUTION SYSTEM
HARNESS TECHNOLOGY THAT 
KEEPS WORKERS COOLER

According to the National Safety Council’s Safety+Health Magazine, “In hot weather, wearing a harness can become uncomfortable. When workers become hot, it is not just discomfort that can cause a work slowdown. Excessive heat can lead to disorders such as heat cramps, heat exhaustion, and heat stroke.”

The DBI-SALA ExoFit STRATA was designed with exclusive padding that allows greater airflow to the back and superior breathability to help keep workers cool.

HARNESS TECHNOLOGY THAT 
ALLOWS WORKERS TO DO
THEIR JOB

Performing regular day-to-day activities at height—like reaching, bending, twisting, and turning—while carrying heavy loads can cause fatigue and increase the risk of back and shoulder injury.

The weight-distribution design of the DBI-SALA ExoFit STRATA redirects weight to the area of the body better suited to carry it: the hips.

During testing, the ExoFit STRATA technology clearly supports workers doing their job: while bending forward to pick up an object, it generated an average of 55% less shoulder weight than that of the competitor harnesses.

According to Bradford C. Bennett, PhD, lead investigator of the study, in test after test, including rotational motion, upward reaching, and lateral bending—the kinds of motion that are critical for at-height workers—the ExoFit STRATA averaged significantly less weight on the subjects’ shoulders than other leading harnesses.

Based on rigorous testing, the technology of the DBI-SALA ExoFit STRATA more than exceeded expectations; now workers can have a harness they’ll want to wear.

ADVANTAGES OF A 
COMFORTABLE SAFETY 
HARNESS

In addition to ensuring more comfortable workers, a truly ergonomic safety harness also translates to good business for employers.

A comfortable harness means:

• **Improved safety.** When fall protection equipment is comfortable to wear, workers are more likely to put it on day after day. The safest harness is the one that’s comfortable enough that workers choose to wear it.

• **Improved productivity.** Keeping workers comfortable on the job directly contributes to their happiness and work satisfaction, which translates to significant productivity gains for employers.

• **Improved worker retention.** When the work is challenging and days at height are long, worker satisfaction greatly depends on how comfortable they are, both on the job and once they have returned home at the end of the day. An exhausted worker feeling the aches and pains from the strain of a poorly designed harness has one more reason to look for their next work opportunity elsewhere.

In the words of Simplified Safety, “Considering the comfort of your employees will go a long way in encouraging them to wear their fall protection.”
INTRODUCING THE DBI-SALA EXOFIT STRATA HARNESS: THE HARNESS WORKERS WILL WANT TO WEAR

As a result of the exhaustive research in the field, meticulous out-of-the-box engineering in the lab, and rigorous ergonomics testing in partnership with the H.C. Sweere Center for Clinical Biomechanics and Applied Ergonomics at Northwestern Health Sciences University, the ExoFit STRATA—the most comfortable, lightest-wearing, truly innovative safety harness ever—was born.

The DBI-SALA ExoFit STRATA incorporates breakthrough weight-distributing technology that drastically improves the ergonomics and decreases the impact on workers’ backs and shoulders.

Some of the features of this first-of-its-kind harness include:

**LiFTech™ Load Distribution System**
Workers can’t always reduce the weight of the equipment they carry, but now they can change the way their body carries that weight. The patent-pending LiFTech load distribution system is integrated into the back of the ExoFit STRATA harness. This system literally takes the weight off workers’ shoulders and redistributes it down to their hips, around their center of gravity. The result: weight is redirected to an area of the body better suited to carry it.

**PolarMesh™ Padding**
Designed to eliminate the sticky, sweaty shirt sticking to a worker’s back, the exclusive PolarMesh padding is specially designed to allow greater airflow. This delivers superior breathability to keep workers cooler—even in hot work environments.

**EZ-Link™ Quick SRL Adapter**
Workers shouldn’t have to choose between safety and productivity. The EZ-Link quick SRL adapter helps workers efficiently attach their personal SRL—such as the Nano-Lok™—reducing the time it takes to connect and disconnect by up to 80% compared to competitive harnesses.

**Revolver™ Vertical Torso Adjuster**
Designed to help workers adjust their harness to the perfect fit without having to deal with excess webbing, the Revolver vertical torso adjusters easily lock down loose ends to keep the ExoFit STRATA properly fitted to a worker’s chest and keep webbing out of the way of getting their job done.

**Tech-Lite™ Aluminum D-Rings**
The Tech-Lite D-Rings on the ExoFit STRATA are all crafted from sturdy yet surprisingly lightweight aluminum to ensure optimal reliability without adding significant weight to the harness.

**Tri-Lock Revolver™ Connectors**
Workers can strap on an added layer of security around their legs with the smooth-locking action of the Tri-Lock Revolver connectors. Designed to store excess webbing, these connectors make it easy to get the perfect fit out of the ExoFit STRATA harness without any clutter getting in the way.

The Final Piece of the Puzzle in Harness Compliance
The final piece of the puzzle in improving worker safety harness compliance is clear: offer workers a harness they want to wear.
Tim Thompson is the Product Manager for soft goods in North America with Capital Safety, a global leader in Fall Protection. Capital Safety has recently been acquired by 3M. The combination of Capital Safety’s industry-leading fall protection products and training courses with 3M’s brand in personal protective equipment and global capability will provide a broader array of solutions to customers.

To learn more about the new ExoFit STRATA, visit www.exofitstrata.com, contact Capital Safety at 800-328-6146, or visit www.capitalsafety.com.