



OH&S

OCCUPATIONAL HEALTH & SAFETY

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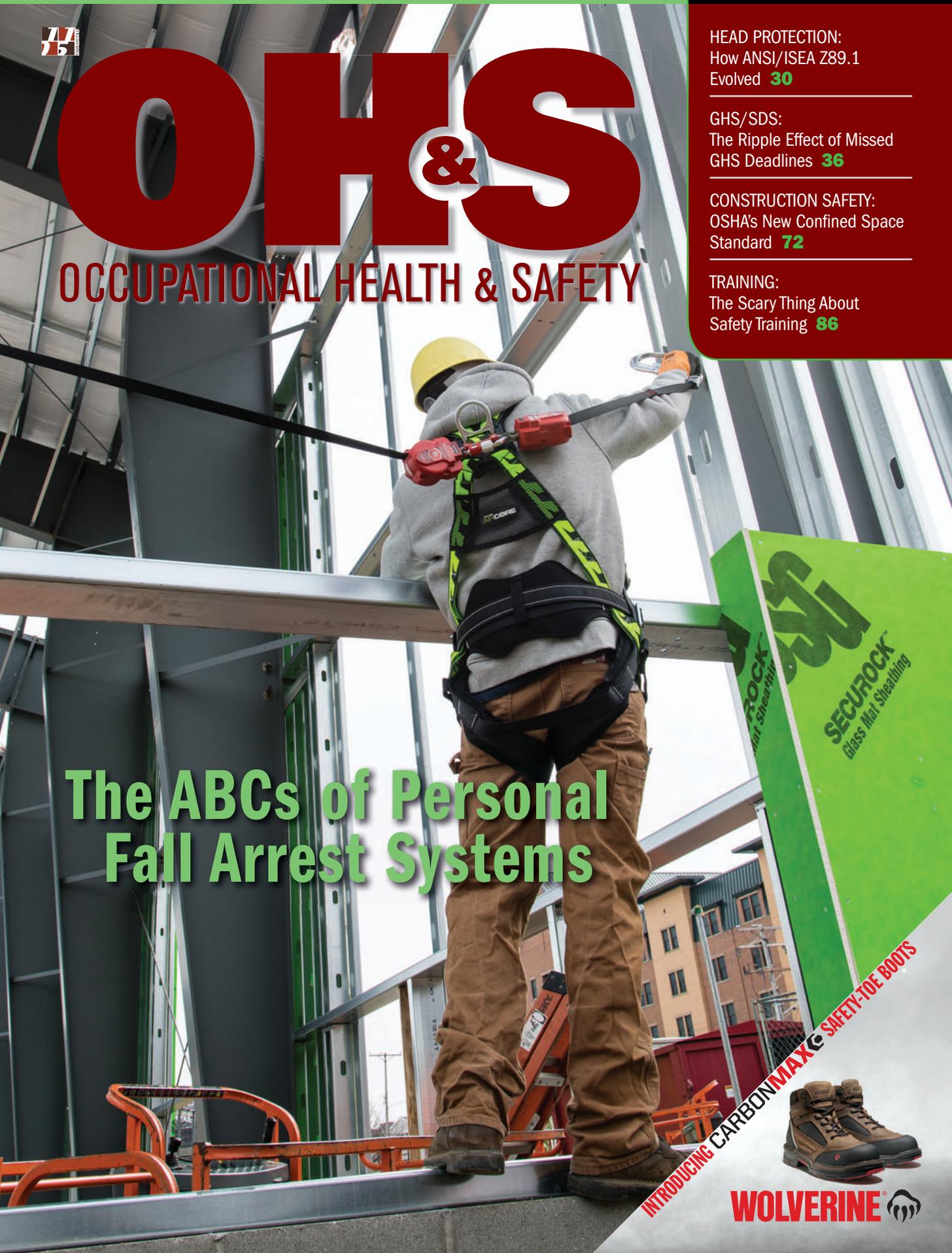
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Conferences Are Golden Opportunities

My family and friends won't believe it, based on my frequent complaints about air travel, but I do enjoy attending OSH conferences. I encounter many friends, usually make valuable new contacts, and learn a lot from experienced safety and health professionals whom I know well or am meeting for the first time. Often I confirm articles that I need from experts at their expo booths or just from chance meetings during lunch, while walking through an expo, or after a presentation. These events are ideal, even crucial, for me. Looking back, I believe they have been essential to whatever success I've had as the editor of this magazine for the past two decades—and I know that I haven't thanked the professional associations' staffers and officers enough for presenting them year after year.

Coming home from AIHce 2015 and Safety 2015, I can report that both were outstanding events—truly the most enjoyable and most productive that I've attended in these series. Both came with a bonus: AIHce took place in beautiful, walkable Salt Lake City, which I hadn't visited in more than 50 years, while ASSE's Safety 2015 was in Dallas, where I work. My easiest conference travel ever! Fortunately, this meeting arrived after May's torrential rains here had ended.

Thousands of safety and health professionals attend these and many other important conferences, including NFPA, VPPPA, A+A, AOHC, annual meetings of ISEA and the International Glove Association, and many others. If you haven't taken the time to attend any of these, you're missing a golden opportunity to learn and network. **OKS**

JERRY LAWS

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VOLUME 84 NUMBER 7

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Occupational Health & Safety (ISSN 0362-4064) is published monthly by 1105 Media, Inc., 9201 Oakdale Avenue, Ste. 101, Chatsworth, CA 91311. Periodicals postage paid at Chatsworth, CA 91311-9998, and at additional mailing offices. Complimentary subscriptions are sent to qualifying subscribers. Annual subscription rates payable in U.S. funds for non-qualified subscribers are: U.S. \$79.00, International \$149.00. **Subscription inquiries, back issue requests, and address changes:** Mail to: *Occupational Health & Safety*, P.O. Box 2166, Skokie, IL 60076-7866, email OHSmag@1105service.com or call 847-763-9688. **POSTMASTER:** Send address changes to *Occupational Health & Safety*, P.O. Box 2166, Skokie, IL 60076-7866. Canada Publications Mail Agreement No: 40612608. Return Undeliverable Canadian Addresses to Circulation Dept. or XPO Returns: P.O. Box 201, Richmond Hill, ON L4B 4R5, Canada.

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- August 19, 2015 11am EST

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It is imperative that you select only equipment that has been tested and approved to tie off at foot level or below.
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All workers exposed to falls should be trained by a competent person to recognize fall hazards and to be familiar with available control methods and equipment.
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HEAD PROTECTION

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The occurrence of experientially based at-risk behaviors driven by anticipated gains that outweigh any perceived costs is not limited to the highways or to drivers; it occurs all too often in the workplace.
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2015 VPPPA Annual National Conference Preview

The Voluntary Protection Programs Participants' Association's 31st Annual National Safety and Health Conference (it takes place Aug. 24-27 at the Gaylord Texas Convention Center, located in Grapevine, Texas, near D/FW International Airport) has strong appeal. It offers a first-rate expo and a strong educational program, with two SafeStart leaders, Larry Wilson and Gary Higbee, co-presenting a free four-hour, pre-conference workshop titled "Leadership for Today's Problems" and a Casino Night set for Aug. 26 to give attendees plenty of time for networking. There's still time to register to attend it at <http://www.vpppa.org/conference/registration>.

Flummoxed by NFPA 70E 2015?

Get the expert advice you need—and it's free!—by attending Hugh Hoagland's July 22 webinar, "NFPA 70E 2015 Changes and Challenges." He's an expert presenter and trainer who promises to help attendees solve 10 challenges presented by the standard's 2015 edition, including these:

- Arc flash study reduction for equipment >40 cal/cm²
- New arc resistant equipment and the limitations of use
- Implementing the new NO PPE rule for operations, risks and benefits and practical solutions
- New minimum label requirements for arc flash and best practices
- What is required in an NFPA 70E audit? Seems like three audits are required.
- What do I do if there are NO labels?

The webinar will begin at 2 p.m. EDT, 1 p.m. CDT. You can register now at www.ohsonline.com.

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Carbon Monoxide
Hydrogen
Hydrogen Sulfide
Methane
Nitrogen Dioxide
Oxygen
Propane
Refrigerants

Applications

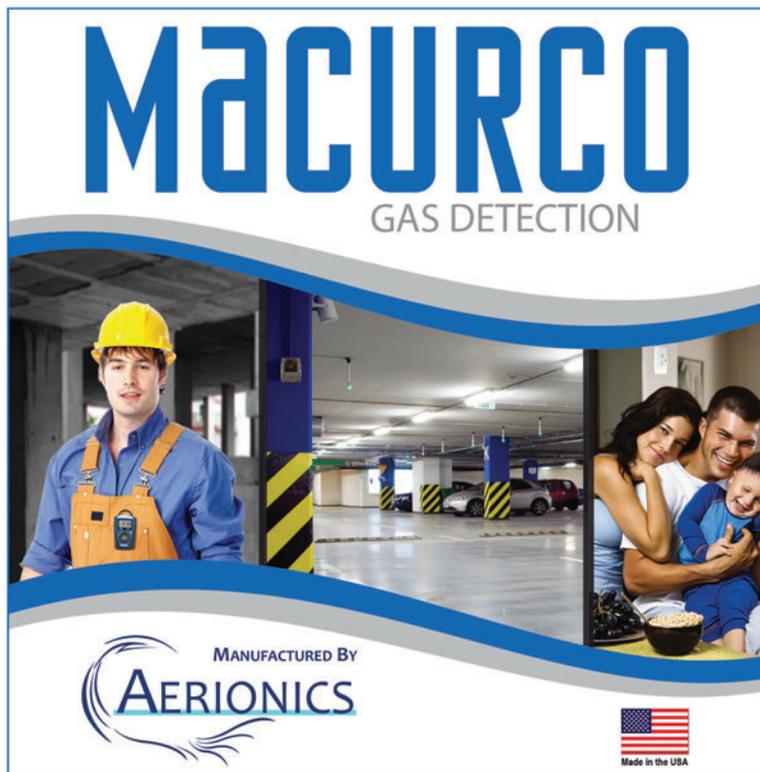
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Industrial
Personal

Types

Portable
Fixed
Stand-Alone System
Control Panels
Addressable
Analog

MACURCO GAS DETECTION

Headquartered in Sioux Falls, South Dakota, Aerionics, Inc. manufactures Macurco Gas Detection products. Aerionics strives to provide the highest quality gas detection, safety and security solutions to customers worldwide.



Celebrating over 40 years of gas detection, Macurco offers equipment for residential, commercial and industrial applications. Since 1972 Macurco has been providing detection options for a number of different gases including carbon monoxide, nitrogen dioxide, hydrogen, propane, natural gas and other toxic and combustible gases. Whether you are looking for gas detection for a security, building automation or HVAC system, for personal safety or for potentially hazardous locations, Macurco has a gas detector to meet your needs.

Aerionics brings a strong management team with extensive experience in gas detection and technology. "Our primary goals are to continue to build upon the existing base of Macurco's technologically superior products and excellent customer service, and to take advantage of our experience in the gas detection industry to further develop and grow our business," said Mike Strandell, CEO of Aerionics Inc.

Aerionics' management team brings a combined forty-plus years of experience in gas detection and related equipment. With extensive design, manufacturing, and marketing experience in the gas detection business, Aerionics, headquartered in Sioux Falls, South Dakota, is well positioned to support and to grow the Macurco line of gas detectors.

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On the Move

The **International Safety Equipment Association's** membership elected **Eric Beck**, MSA's executive director of strategic marketing, chairman of the association's Board of Trustees and **Sheila Eads**, president and CEO of **ERB Industries**, vice chairman. As well, the membership elected Ergodyne CEO and President **Tom Votel** and **Nate Kogler**, director of product management at **Bradley Corporation**, to seats on the board. The elections took place during ISEA's Executive Summit earlier this year in San Antonio. Continuing members of the board are **Nate Damro**, president, Europe, Middle East, and Africa at **Capital Safety**; **Jim Johnson**, general manager of **Encon Safety Products**; **John Kime**, chief operating officer of **Avon Protection Systems**; and **Craig Wallentine**, Global Business Development manager of **DuPont Personal Protection**. . . **Atlas Copco Construction Equipment** recently appointed five managers to lead its expanding road construction division. **Brian Bieller** is vice president and road construction equipment business line manager, **Steve Cole** is the distribution business development manager, **Tim Hoffman** is the heavy compaction equipment product manager, **Jonathan Oney** is paving and milling equipment product manager, and **Imelda Moon** is the equipment parts product manager. "Our division is expanding to provide quality products and unparalleled support for our growing dealer network, rental partners, and end users," said **Erik Sparby**, Atlas Copco Construction Equipment's president and general manager. "The new appointments ensure that we are backing our customers during this exciting growth at all levels of production, from equipment design to aftersales support." Bieller previously was Atlas Copco's vice president of business development. Atlas Copco also has appointed **Matt Cadnum** vice president of sales for its rental channel. He previously served as Atlas Copco Construction Equipment's aftermarket vice president. "Rental centers have always been an important part of our business because they offer end-users a cost-effective alternative to owning equipment," said Sparby. "Matt's previous



BRIAN BIELLER

ATLAS COPCO CONSTRUCTION EQUIPMENT

success with developing service operations, customer support teams, and logistics will translate well in his new role, supporting an industry that thrives on products that have high utilization rates. And his excellent relationship with many rental centers makes him an excellent fit for his new role." . . . **Spider**, a division of Seattle-based SafeWorks, LLC, announced **J.T. Foreman** has joined its Houston operation center as a district sales representative responsible for solving the suspended scaffolding and fall protection challenges of contractors and facility owners throughout the southern and Gulf Coast regions of Texas. **David Beckett**, vice president and general manager of Spider Operations, said the new hire "brings a deep skill set, a diverse business background, and a genuine commitment to achieving goals to his position. This combination will prove to be invaluable as J.T. connects with Spider customers in his territory, both new and existing, industrial and commercial." . . . Dr. **Robert Kimball**, MD, FCFP, is serving as president of the **Urgent Care Association of America's** board of directors, taking the reins in April 2015 from Dr. **Nathan Newman**, MD, FAAFP, who was president of the association from 2013 to 2015. "I am honored to be named president of the UCAOA board of directors during this very exciting, challenging time," Kimball said. "Urgent care centers are a vital part of the health care system, and we all have to be advocates for access to urgent care in every state. I urge all our members and our communities to get more involved in this issue." Kimball practices urgent care and occupational medicine as medical director of urgent care for **Piedmont Health-Care**, one of the largest physician-owned, multi-specialty groups in North Carolina. . . . Franklin, Tenn.-based **FDRsafety** has promoted **Tim Sirofchuck** to chief operating officer of FDRsafety, the company announced in May. Sirofchuck oversees the safety consulting firm's day-to-day operations. "Tim is a longtime leader in the field of occupational safety and health, and his expertise will be invaluable to our clients as FDRsafety continues to grow," said **Jim Stanley**, FDRsafety's president. Sirofchuck joined FDRsafety as a vice president in 2014 from Clark Construction Group LLC, a general contractor, where he was vice president and corporate safety director.

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Mergers & Acquisitions

■ Capital Safety announced May 1 that it has acquired Python Safety, Inc., a Woodstock, Ga.-based company that provides dropped object prevention solutions for tools and equipment. "We are very excited to have Python Safety become part of Capital Safety. This acquisition is a natural extension for us and in line with our continued commitment to bringing workers home safely," said Stephen Oswald, CEO of Capital Safety. "Struck by falling objects is a leading cause of injury for workers, and Python Safety's portfolio of products are designed to prevent tools and equipment from falling. This deal enables us to bring a broader range of solutions to our customer base and helps them keep their employees safe."

Mark Caldwell, CEO of Python Safety, said his company gains from the acquisition. "As a combined organization, we will be able to leverage Capital Safety's global organization and distribution channels with our core strength in drop prevention to broaden our reach and bring even more innovative solutions to a larger customer base. It will also allow us a better opportunity to expand the definition of fall protection to include tools and equipment," Caldwell said.

■ Toledo, Ohio-based Impact Products, LLC (www.impact-products.com, a division of S.P. Richards Co.), has acquired the assets and intellectual property of the Commercial Containers and Food Service division of Dinesol Plastics, (Niles, Ohio). Impact Products' announcement said the acquisition enhances the company's continued growth and commitment to the food service supplies category, and that the additional products will be available along with thousands of janitorial, safety, and odor control products offered by Impact.

Business Moves

■ Examinetics, Inc. and Occupational Health Dynamics announced they have entered a new strategic alliance for online respirator clearances. Overland Park, Kansas-based Examinetics is the largest U.S. provider of on-site occupational health screening services, while Hoover, Ala.-based OHD sells products including the Quantifit® respirator fit tester. The respirator clearance is to be completed prior to fit testing with the OHD Quantifit®. Real-time results are seen immediately, even for test results across multiple locations, according to the companies' announcement. The clearance program is offered online, but paper questionnaires are available upon request, and both versions are available in English and Spanish.

■ Blackline GPS announced that its in-house Safety Operations Center has increased geographic coverage to serve customers located in the United States. The center's around-the-clock service complements Blackline's Loner® portfolio of safety monitoring products and services, delivering a one-stop solution that enhances employers' work-alone programs. "Since introducing our Safety Operations Center in Canada last quarter, we have on-boarded many U.S. customers, bringing the total number of monitored personnel to approximately 3,500," said Blackline COO Kevin Meyers. "Instead of using internal resources, many of our customers choose to have Blackline monitor their employees so they can keep their teams focused on business operations."

■ Wheeling, Ill.-based property restoration company Response Team 1 recently acquired four regional property restoration firms: Empire Construction & Technology, Inc. (Irvine, Calif.); ESN Restoration

Services (San Marcos, Calif.); QCI Restoration (Elgin, Ill.); and Worldwide Restoration, Inc. (Tulsa, Okla.). Response Team 1 serves 34 states from 25 locations.

■ Enhancements in VAC-U-MAX's material test facility in Belleville, N.J., allow it to simulate customers' bulk material handling applications, incorporating dense and dilute phases in vacuum and/or pressure conveying for batch, continuous, loss-in-weight, and gain-in-weight applications, the company announced. Material tests are conducted on site with a wide range of VAC-U-MAX equipment, and



systems testing can incorporate other OEM equipment, such as rotary valves or other components requested by customers. To request a test, visit www.vac-u-max.com or call 1-800-VAC-U-MAX. **OHS**

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Existing hearing loss does not affect results. Tests both earmuffs and earplugs.

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* Trompette, N., & Kusy, A., (2013). "Suitability of Commercially Available Systems for Individual Fit Testing of Hearing Protectors." InterNoise, Innsbruck, Austria.



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Advancing Protection in Sight



Fall Protection for Iron Workers

It is imperative that you select only equipment that has been tested and approved to tie off at foot level or below.

BY MARTY SHARP



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As most of us view life, iron workers live dangerously. We use all of the clichés over and over again. “Their lives are hanging by a thread.” “They’re at the top of the world.” “Their life is on the line.” Let’s do our part to keep them hanging.

It can be discouraging. Year after year, we read the same statistics. Falls are among the top sources of injuries and fatalities on the construction site. At the same time, fall protection violations lead the list of OSHA citations annually.

We’ll take a look at OSHA’s fall protection standard. It’s broad in scope, covering new construction, alterations, or repair of “structures” when the erection of steel takes place. Cranes, bins, hoppers, ovens, furnaces, amusement park rides, stadiums, bridges, trestles, overpasses, billboards, and light towers are among examples of types of structures covered, in addition to buildings. Some structures are specifically excluded from coverage. These include tanks, electrical transmission towers, and communication or broadcast towers.

The OSHA standard is a key. You must know and understand its requirements. However, it is only one part of what we look at as a five-piece puzzle.

Probably number one for you is “recognizing a fall hazard” when you see it. Obviously, you cannot deal with a problem if you are not aware of it. The eye test will often tell you when something is unsafe. Then, dig deeper! How can you mitigate the situation? Can the task be completed in another way? Many times,

the answer is “no.” What then can be done to protect the worker? It is your responsibility to deal with the hazard. Failure to do so may result in prosecution for willful intent or manslaughter if a death occurs. We read recently of a superintendent who was sentenced to jail for failure to provide fall protection.

You need a plan. We recommend a five-part program of understanding. Remember our five-part puzzle. These points are critical, not simply important, especially in the event of an accident.

1. Recognize the hazard
2. Understand the manufacturer’s instructions
3. Develop and record your company policy
4. OSHA regulations
5. ANSI standards

Let’s look at each of them individually.

Manufacturer’s Instructions

These instructions may claim to meet ANSI, in which case the actual use of the product must also comply. The manufacturer may put limits on the use of a product and, as a user, you must pay attention. For example, an eyewear manufacturer may claim compliance with Z87 but limit the use by including the statement, “beware of grinders.”

Company Policy

Remember, at a minimum your internal regulations must meet OSHA requirements. They may be written around ANSI standards, even if not adopted by OSHA, or be of your own creation. However, once adopted internally, you must comply. Failure to do so can result in an OSHA violation.

OSHA

Any portion of an ANSI standard adopted by OSHA, by amendment, becomes a regulation and compliance is mandatory. A user found “not in compliance” is subject to a fine.

ANSI

A committee of manufacturers establishes a set of “best practices.” These are simply voluntary standards with which the user may or may not comply. OSHA may adopt these standards as a whole or in part by amendment. Once adopted by OSHA, they become mandatory.

OSHA 29 CFR, Subpart R 1926.760

Basically, every employee walking or working more than 15 feet above a lower level must be protected. Most GCs restrict this to 6 feet. Paragraph 1926.760(a) says the worker shall be protected from fall hazards by:

1. Guardrail systems

There are only a few retractables on the market designed for foot level drops and even fewer designed for below the feet drops.

2. Safety net systems
3. Fall restraint systems
4. Positioning device systems
5. Personal fall arrest systems

Acceptable criteria for each of these systems are spelled out in Appendix G in the standard.

The focus of this article is the plan for fall arrest systems.

When personal fall arrest systems are employed, they must meet the following criteria:

1. The maximum arresting force on an employee must be limited to 900 pounds when using a body belt.
2. The maximum arresting force on an employee must be limited to 1,800 pounds when using a harness.
3. The employee cannot free fall more than 6 feet or contact any lower level.
4. The employee must be brought to a complete stop, and the deceleration distance of travel must not exceed 3.5 feet or what the system allows.
5. The system must be strong enough to withstand twice the

potential impact energy of an employee free falling 6 feet or the free fall distance allowed by the system, whichever is less.

Look at criteria 3 and 5 above. Both reference a 6-foot drop. Compliance may not be possible. A general contractor sent this question to OSHA and received the accompanying interpretation.

Interpretation M-3

Subject: §1926.502(d)(16)

Personal fall arrest equipment

Question: The provision in §1926.502(d)(16) requires that free fall distance be limited to 6 feet. It is impossible to design an attachment point that will allow me to limit the free fall to 6 feet. What are my obligations?

He received the following response:

Answer: §1926.502(d)(16) also requires that the maximum arresting force be limited to 900 pounds when the personal fall arrest system incorporates a body belt and 1,800 pounds when the system incorporates a body harness. If the employer has documentation to demonstrate that these maximum arresting forces are not exceeded and that the personal fall arrest system will operate properly, OSHA will not issue a citation for violation of the free fall distance.

Basis for Decision: U.S. manufacturers of fall protection equipment test their equipment in accordance with test procedures pre-

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scribed in ANSI standards (ANSI A10.14 and ANSI Z359), which call for equipment to be tested based on a 6-foot free fall distance. Unless the equipment has been tested for a free fall greater than 6 feet, the results are unknown. Therefore, if an employer must exceed the free fall distance, the employer must be able to document, based on test data, that the forces on the body will not exceed the limits established by the standard and that the personal fall arrest system will function properly.

How do we accomplish this? We must use tie-offs at foot level or below. All anchorage points must be rated for 5,000 pounds, or a safety factor of two, and remember, fixed systems or catenary line are like upside-down two-legged bridles.

Off-the-shelf systems to meet the need are available. However, all components of the system must meet the requirements of 1926.502. Connection shall be drop forged, pressed or formed steel, or made of equivalent materials. They shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.

D-rings and snaphooks shall have a minimum tensile strength of 5,000 pounds (22.2kN). They shall be proof-tested to a minimum tensile load of 3,600 pounds (15kN) without cracking, breaking, or taking permanent deformation. Snaphooks shall be sized to be compatible with the member to which they are connected to prevent unintentional disengagement of the snaphook caused by depression of the snaphook keeper by the connected member, or shall be a locking type snaphook designed and used to prevent disengagement of the snaphook by contact of the snaphook keeper by the connected member.

Unless the snaphook is a locking type and designed for the following connections, snaphooks shall not be engaged directly to webbing, rope, wire rope, to each other, or to a D-ring to which another snaphook or other connector is attached.

Unless a locking type, the snaphook shall not be engaged to a horizontal lifeline, or to any object which is incompatibly shaped or dimensioned in relation to the snaphook such that unintentional disengagement could occur by the connected object being able to depress the snaphook keeper and release itself.

On suspended scaffolds or similar work platforms with horizontal lifelines which may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.

Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses shall be made from synthetic fibers.

Anchorage used for attachment of personal fall arrest equipment shall be independent of an anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds or a safety factor of two (22.2 kN) per employee attached, or shall be designed, installed, and used as follows: As part of a complete personal fall arrest system that maintains a safety factor of at least two, and under the supervision of a qualified person.

Considerations and Questions Relating to This Off-the-Shelf Solution

1. Load: There are only a few retractables on the market designed for foot level drops and even fewer designed for below the feet drops. It is a good idea for the unit engineered into the system to have a mechanical shock absorber with a disk brake mechanism

designed for free falls up to 78 inches when tied to a rigid tie-off point, keeping the impact to the body under 900 pounds, unlike some seatbelt-like mechanisms with a shock pack on the end. This type of unit would be in violation. Another benefit of the acceptable retractable is that the line is under tension during the drop. The web or wire coils back into the unit, and then the disk brake kicks in for a soft drop with less chance of lower-level contact. In addition, when dropping on a catenary line (not a rigid tie-off point), there is shock absorber capability in the line itself. It's like jumping on a trampoline: On the way down, energy is absorbed. You just don't bounce back up. This makes the impact to the line less, increasing the safety factor.

2. Q: Does where the drop occurs on the line affect the angle of deflection adding greater or less stress on either anchorage point?

A. Yes and no. Some engineers theorize that this would be a factor. Other engineers have theories that since the catenary line has sag and deflection, that the blow on the cable is a glancing hit and the hook slides a little bit, if that's the same amount of energy over a longer period of time. The peak load is less. It's very similar to when an employee falls headfirst. Many times, the shock pack will not deploy all the way because it takes time to bring the employee back into an upright position. In doing the physical test, the latter proves to be true. The middle of the span is worst-case scenario.

B. 3/8" galvanized cable has an M.B.L. (minimum break load) of approximately 14,000 pounds. So it's good for two people, right? Wrong!

Example: In the mid-1990s, my wire rope company sold a trailer manufacturer 100 feet of 3/8" cable with a large turnbuckle at one end. Unfortunately, my order desk didn't ask enough questions on what the application was. They strung it above the trailers and tightened it tight enough to play a song on it. They dropped a pulley on the cable and hooked a retractable to it; the employee could go along the top of the trailer stapling the roof on. When the supervisor wasn't looking, one of the employees decided to use it as a zip line and run off the back of the trailer to see how far he could go down the line. The plan was for another employee to pick him up with a boom truck when he stopped. On the first attempt, the cable snapped. The employee was fortunate he just broke a few bones. If it was higher up, it could have been fatal. Obviously this was not an engineered system. Engineers use some of these factors when calculating deflection under load.

Choose Your Equipment Carefully

By nature, a skeletal structure is rising very slowly from the ground. Beams are narrow, providing a limited working surface. Work is constantly at the topmost point, meaning anchorages and tie-offs must be at a worker's feet.

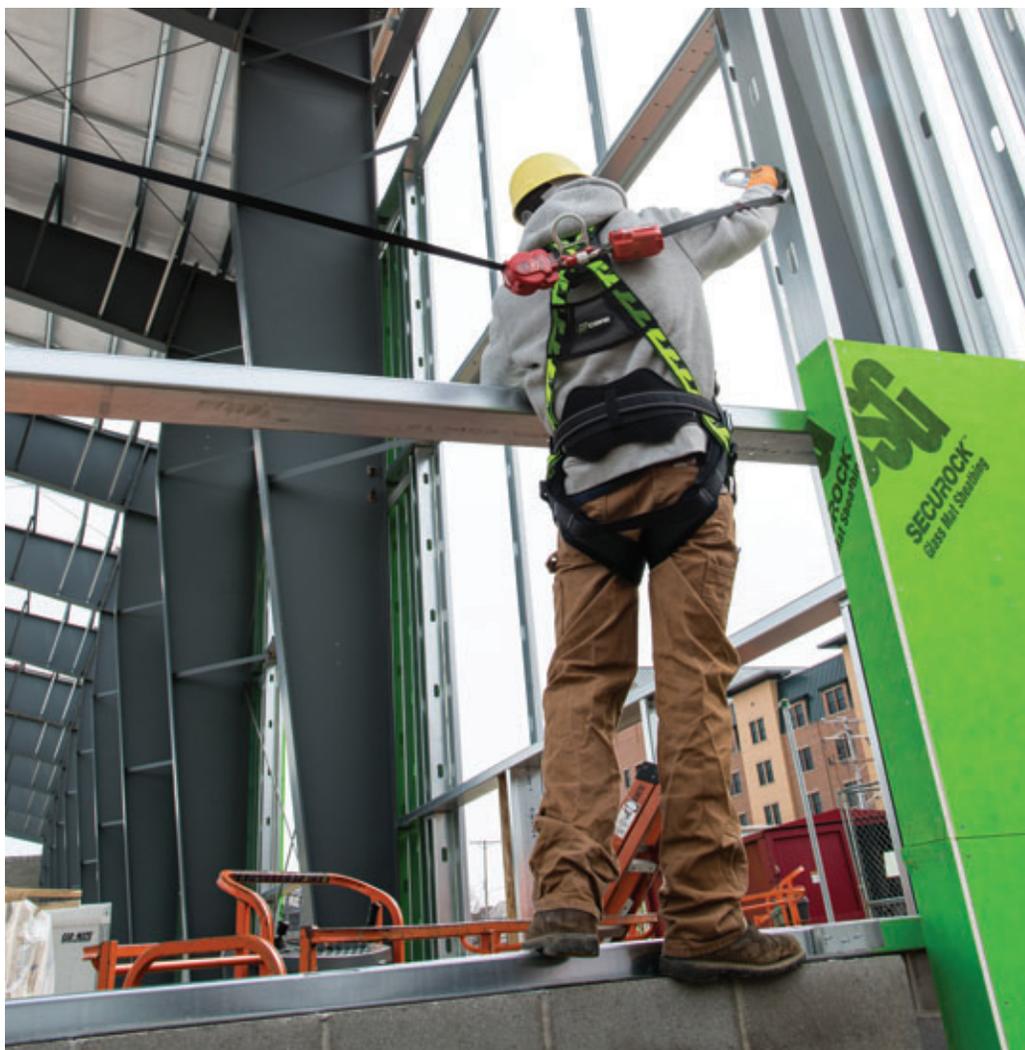
It is imperative that you select only equipment that has been tested and approved to tie off at foot level or below. Remember, "his life is on the line." I trust the above remarks have "gotten you thinking." Call me if I can be of help: 1-800-850-5914. **OHS**

Marty Sharp is president of Ultra-Safe Inc. (www.ultrasafeusa.com), Phoenix, Ariz.). He is a hands-on president, overseeing every aspect of the company. His personal expertise is as a trainer and sales person. His training sessions are extremely well received as his style is chock full of personal anecdotes while delivering the necessary information.

The ABCs of Personal Fall Arrest Systems

All workers exposed to falls should be trained by a competent person to recognize fall hazards and to be familiar with available control methods and equipment.

BY HUGH SMITH



HONEMELL SAFETY PRODUCTS

Three key components of a Personal Fall Arrest System (PFAS) must be properly in place to provide maximum worker protection. None may be able to do the job alone. However, in combination, they form the ABCs of fall protection and are vitally important to job site safety.

A is for Anchorage/Anchorage Connector

Anchorage connectors (tie-off points) secure a connecting device to an *anchorage*. Anchorage selection is critical because, should a fall occur, the worker will be suspended from that anchorage—with his or her

life depending on its strength. The anchorage should be easily accessible, located a safe distance above any lower obstacles, and capable of supporting 5,000 pounds per worker.

Note the distinction between an anchorage and an anchorage connector. An anchorage, for example, could be an I-beam. An anchorage connector might be a cross-arm strap, or choker, wrapped around the beam to permit attachment.

Active Fall Protection Systems

If perimeter platforms cannot be used, install active systems and require workers to don harnesses

and connect to an overhead system. Active fall protection systems include fixed-point anchors, horizontal lifelines, and conventional beam and trolley systems—each attached to the existing overhead structure.

According to OSHA, fall protection systems must be “capable of supporting at least 5,000 lbs. (22 kN) per employee attached” or be part of a complete system designed by a qualified person that maintains a safety factor of at least two. Thus, any active fall protection system should be designed by a qualified and experienced person and include an analysis of the supporting structure.

Passive Fall Protection Systems

Considering OSHA’s Hierarchy of Fall Protection Controls, where fall hazards cannot be engineered out, the best option is to utilize a passive fall protection system. These require no special equipment or active worker participation. Such systems (e.g., catch platforms) can be installed around the perimeter of the work area. They should be of adequate width and include an exterior handrail to catch a worker. They also can serve as work platforms.

Fixed Point Anchors (FPAs)

The easiest active system to integrate may be a series of FPAs over the work area. Each FPA consists of a certified anchor point to the existing overhead structure, from which a shock-absorbing lanyard or self-retracting lifeline (SRL) is supported. Workers work centrally under each FPA, within an approximately 15-degree range. They transition to adjacent FPAs as work progresses, maintaining 100

percent connectivity. If a limited number of workers are making frequent transitions to adjacent FPAs, this system may hinder productivity. FPAs also require significant structural anchoring. Therefore, consider a mobile anchorage point.

Mobile Anchorage Points

Horizontal lifelines (HLLs) and conventional beam-and-trolley monorail systems attached to the overhead structure offer uninterrupted protection while working. Either system can be designed for multiple workers. Both should be equipped with SRLs and be located centrally over the work area to avoid swing falls. Consider parallel systems for multiple workers.

Simple engineered HLL systems are available as kits, but these are generally limited to single-span applications. More sophisticated HLLs incorporate a pass-through feature, whereby a proprietary shuttle can automatically pass through intermediate lifeline support points. These systems may be multi-span; they can reduce HLL deflection and costs. HLLs should include a tension-indicating mechanism to properly tune the system for reliable performance. Also, an HLL may require an in-line shock absorber to reduce forces to the supporting structure.

In general, HLLs are the economical alternative to higher-priced beam-and-trolley systems. However, some structures cannot easily support the high anchor forces that accompany HLLs. In these cases, beam-and-trolley systems, which show negligible deflection and ensure smooth-running performance, may have the advantage.

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Finally, all workers exposed to falls should be trained by a competent person to recognize fall hazards and to be familiar with available control methods and equipment.

B is for Body Wear

A full-body harness includes hardware, webbing, and pads, each with specific functions.

Hardware must be sturdy and easy to attach to connecting devices. Avoid oversized, excessively small, or awkward components or otherwise incompatible hardware. Watch for unintentional disconnection from components (“roll-out” or “burst-out”). Steer clear of hardware with sharp edges that can cut harness webbing or workers.

Construction is important in friction buckles. If not spring-loaded, they can loosen once the harness has been adjusted for fit. Beware of exposed springs, especially on friction buckles; such springs can become disabled or dislocated.

Webbing varies drastically among brands. Select sturdy webbing with tightly woven yarn that slides through hardware without snagging. If webbing is cut, burned, frayed, etc., remove the harness from service. Webbing should meet the ANSI standard of 5,000 pounds (22 kN) tensile strength, endure traditional abrasion tests without fraying and puckering, and resist natural weather effects. In a harsh chemical environment, it must resist toxic chemical fumes and splashes. Stitching should be strong enough not to rip away during a fall.

Padding should be pliable and easy to adjust, to ensure a comfortable fit. Padding also must withstand harsh weather and maintain its shape. Because padding can become brittle in cold weather, select padding that features breathable fabric and durable construction.

Critical Components, Critical Fit

A comfortable fit is crucial to compliance—as is a snug fit with chest, back D-ring, and leg straps.

The placement and connection of the chest strap and back D-ring are critical for proper harness fit and safety. Chest straps must be positioned in the mid-chest area. Back D-rings must be located in the middle of the back between the shoulder blades. Both must be tightened for a snug fit.

Chest straps should be easy to adjust and able to withstand fall forces without

tearing or breaking. If improperly fastened, a strap can slide up around a worker’s neck in a fall. Metal chest hardware is the preferred choice for safety; it should consistently meet 4,000 pounds (17.8 kN) of “pull force” when tested.

Size harnesses appropriately to ensure compliance. Employees more readily (and properly) wear a comfortable harness that’s easy to adapt to lanyards and other connecting devices. Better harness selection means improved compliance and safety.

C is for Connecting Device

The critical link between harnesses and anchorage points is the connecting device.

A lanyard is a flexible line securing a full-body harness to an anchorage point. There are two basic categories: non-shock-absorbing and shock-absorbing. The more common and safer is the shock-absorbing variety, which comprises the majority of all lanyards sold today. Do not use non-shock-absorbing lanyards for fall arrest.

Shock-absorbing lanyards provide deceleration distance during a fall, reducing fall arresting forces by 65-80 percent below the threshold of injury, as specified by OSHA and recommended by ANSI. The most reliable include a special shock-absorbing inner core material surrounded by a heavy-duty tubular outer jacket that doubles as a backup web lanyard. Per OSHA, all lanyards must have double-action, self-closing, self-locking snap hooks to reduce the possibility of roll-out.

Shock absorber packs can be attached to, or built into, non-shock-absorbing lanyards to provide shock-absorbing capability. During a fall, an inner core smoothly expands to reduce fall arrest forces. Some feature a backup safety strap.

Self-retracting lifelines (SRLs, fall limiters, personal fall limiters, yo-yos, seatbelts, blocks, etc.) are alternative connecting devices.

While traditional 6-foot shock-absorbing lanyards allow for up to 6 feet (1.8 meters) of free-fall distance prior to activating, self-retracting lifelines require less than 2 feet to arrest free falls. With their shorter activation and arresting distances, self-retracting lifelines reduce the risk of workers’ hitting the ground or impacting obstructions at lower levels. They also allow for easier rescue. Self-retracting lifelines enable greater horizontal and vertical mobil-

ity than standard 6-foot shock-absorbing lanyards. Self-retracting lifelines are available with working capacities from 6 feet (1.8 meters) to 175 feet (53 meters).

Whenever possible, when using a lanyard or lifeline, position the anchorage point directly overhead to protect the worker from a swing fall or pendulum effect during a fall.

While no single component is subjected to the total fall force, connecting devices comprise only one strength member (e.g., webbing, rope, steel cable). Substandard design, poor-quality workmanship, excessive exposure to UV light or to chemicals, physical damage, improper storage, or inadequate inspection can lead to device failure.

Selection Considerations

Evaluate the following when choosing a connecting device:

- Type of work and specific work site conditions, including the presence of moisture, dirt, oil, grease, acids, electrical hazards, and ambient temperature.

- Potential fall distance—usually greater than anticipated. Consider the length of the connecting device, the length of elongation during deceleration, and worker height, then add a safety factor.

- Compatibility of system components. A personal fall arrest system should be designed and tested as a complete system because components from different manufacturers may not be interchangeable or compatible; this can cause roll-out.

- Product quality. While OSHA regulations are U.S. law and are enforced by a federal agency, ANSI standards are self-enforced, with no inspectors. Do not take stated performance per ANSI guidelines for granted.

The ABCs

The consequences of failure of a personal fall arrest system can be severe and far-reaching: worker injury or fatality, lawsuits, higher insurance and workers’ compensation premiums, and lost time from the job. The best fall protection cultures of safety begin with the ABCs. **OKS**

Hugh Smith (Hugh.Smith@Honeywell.com) is Regional Product Line Marketing Manager for Miller Fall Protection at Honeywell Safety Products in Franklin, Pa.

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Heads Up!

Just as important as actually wearing a hard hat when needed is making sure the hard hat fits properly. Hard hats must fit securely to provide maximum protection.

BY SALLY J. SMART

The hard hat is a piece of personal protective equipment (PPE) designed to protect us when all other methods of protection cannot. Its use is often required since all hazards simply cannot be eliminated. Hard hats protect our heads when we are at risk from bumping our heads; from falling tools or materials when there are workers, machines, conveyor belts, etc. above us; from objects being carried or swung nearby; or from electrical shock and burns. These hazards exist in most workplaces in many different forms.

Hard hats are commonly worn by carpenters, construction workers, electricians, freight handlers, linemen, mechanics, plumbers, pipe fitters, timber cutting and logging operators, warehouse laborers, and welders.

Occupational Safety and Health Administration Guidance

The Occupational Safety and Health Administration (OSHA) guidelines for head protection are referenced in 29 CFR 1910.135 (General Industry) and 1926.100 (Construction).

29 CFR 1910.135(a)(1) states, "The employer shall ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects." The standard also covers conditions where electrical hazards are present. 1910.135(a)(2) states, "The employer shall ensure that a protective helmet designed to reduce electrical shock hazard is worn by each such affected employee when near exposed electrical conductors which could contact the head."

Construction

Depending on the intended use and the manufacturer, hard hat shells may be made of a thermoplastic resin such as polyethylene or polycarbonate, fiberglass, resin-impregnated textiles, or aluminum. Because it is strong, lightweight, easy to mold, and nonconductive to electricity, high-density polyethylene is used most often.

The suspension system consists of strips of woven nylon webbing and bands of molded high-density polyethylene, nylon, or vinyl. Suspensions are available with either four, six, or eight attachment points. Typically, hard hats with more suspension points



spread out the potential force of a localized blow to the head by distributing the force over a broader area.

All hard hats are designed to provide protection from impact and penetration hazards. Some also provide protection from electric shock and burns.

Performance Criteria

The performance criteria for head protection are provided in the American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) Z89.1 *American National Standard for Industrial Head Protection*. This standard does not cover bump caps, firefighting helmets, or head protection devices used in recreational activities. ANSI/ISEA Z89.1 is incorporated by reference in 29 CFR 1910.135.

On Sept. 9, 2009, OSHA issued an update to its PPE standards. The final rule went into effect in October that year and revised the PPE sections of OSHA's general industry, shipyard employment, longshoring, and marine terminals standards regarding requirements for eye and face protective devices, head protection, and foot protection. The revision updated the references in these regulations to recognize the more recent editions of the applicable national consensus standards.

ANSI/ISEA Z89.1-1997

Beginning with the ANSI Z89.1-1997 standard, Type I designates hard hats designed to reduce the force of impact resulting from a blow only to the top of the head, while Type II designates hard hats designed to reduce the force of impact resulting from a blow to the top or sides of the head. This revision also re-designated the electrical-protective classifications for hard hats as follows:

- Class G (general): Designed to reduce the danger of contact with low-voltage conductors and are proof tested at 2,200 volts
- Class E (electrical): Designed to reduce the danger of contact with conductors at higher voltage levels and are proof tested at 20,000 volts

Before and after each use, hard hats should be inspected for wear and damage. Inspect the shell for breakage, cracks, discoloration, chalky dull appearance, or any other unusual condition.

- Class C (conductive): Provide no protection against contact with electrical hazards

ANSI/ISEA Z89.1-2003

The most significant changes from the 1997 version were made to harmonize with other national standards that test and evaluate equipment performance. In addition, many physical hard hat requirements that did not provide added user value, or that limited design or performance, were removed.

ANSI/ISEA Z89.1-2009

ANSI published a revision in January 2009. The significant changes from the 2003 version included three non-mandatory tests:

- Reverse donning: Hard hats marked with a “reverse donning arrow”  can be worn frontward or backward in accordance with the manufacturer’s wearing instructions.

- Lower temperature: Hard hats marked with an “LT” indicate the hard hat meets all testing requirements of the standard when preconditioned at a temperature of -30° C (-22° F).

- High visibility: Hard hats marked with an “HV” indicate the hard hat meets all testing requirements of the standard for high-visibility colors. This includes tests for chromaticity and luminescence.

ANSI/ISEA Z89.1-2014

ANSI/ISEA Z89.1-2014 was issued on May 15, 2014 and contains three main changes from the previous revision:

- Under the section of Accessories and Replacement Components, there is further clarification that accessory or component manufacturers are required to prove that their components do not cause the helmets to fail.

- Some additional language was added under the Instructions and Markings section to help clarify that “useful service life” for helmets is not required by the standard. It is up to helmet manufacturers whether they want to include specific service life in terms of years. Manufacturers can elect to specify the number of years for their helmet’s service life or elect to identify

certain conditions that may affect a helmet’s protective capability over time.

- The Higher Temperature section has been updated to incorporate an optional preconditioning at a higher temperature of 140° F +/- 3.6° F (60° C +/- 2° C). Previously, hot temperature preconditioning was conducted at 120° F +/- 3.6° F (48.8° C +/- 2° C). Helmets that meet the performance criteria after being preconditioned to these higher temperatures (140° F) are designated with an HT marking.

Markings

Hard hats conforming to the requirements of ANSI Z89.1-2014 must be appropriately marked to verify compliance. The following information must be marked inside the hard hat:

- The manufacturer’s name or identi-

fying mark

- Date of manufacture
- The legend “ANSI Z89.1-2014”
- The type and class designation
- The approximate head size range

If optional performance features are applicable, the appropriate marking(s) must be applied in the sequence as shown below:

-  - Reverse Donning
- LT - Lower Temperature
- HV - High Visibility
- HT - Higher Temperature

Sizing

Just as important as actually wearing a hard hat when needed is making sure the hard hat fits properly. Hard hats should not be too big or too small. They must fit securely to provide maximum protection.

Hard hat sizes can seem a bit mysterious. To measure for your hat size, place a soft cloth tape measure around the widest part of your head (this is usually just above the eyebrows). Pull the tape measure snug, but not tight. Convert the measurement to your hat size using the chart shown below:



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Sizing Chart		
HAT SIZE	CIRCUMFERENCE	
	Centimeters	Inches
6-1/2	52	20-1/2
6-5/8	53	20-7/8
6-3/4	54	21-1/4
6-7/8	55	21-5/8
7	56	22
7-1/8	57	22-3/8
7-1/4	58	22-3/4
7-3/8	59	23-1/8
7-1/2	60	23-1/2
7-5/8	61	23-7/8
7-3/4	62	24-1/4
7-7/8	63	24-5/8
8	64	25
8-1/2	68	26-1/2

Inspection and Care

Before and after each use, hard hats should be inspected for wear and damage. Inspect the shell for breakage, cracks, discoloration, chalky dull appearance, or any other unusual condition. If any of these conditions exists, replace the hard hat. Always replace your hard hat if it has withstood an impact or penetration. Check the suspension for loss of flexibility, cracks, breaks, frayed straps, or damaged stitching. If any of these conditions is noticed, replace the suspension. Most hard hat manufacturers offer replacement suspensions as a standard replacement part.

Hard hats must be cleaned regularly in order to be adequately inspected. When not in use, they should be stored in a clean, dry environment not above 120° F.

Summary

We must remember to always *wear* our hard hats. If they are sitting at a desk, on a work bench, or in a truck, they are definitely not going to protect us.

It goes without saying that our head is worth protecting. A single head injury can handicap us for life or may be fatal. Injuries to those of us not wearing hard hats can come from virtually every angle—while looking down, looking straight ahead, and when bumping into stationary objects.

Head up, eyes open, and hard hat on! **OHS**

Sally J. Smart, ASP, has more than 25 years of applied environmental, health and safety experience. She is currently a Technical Safety Specialist for Grainger, providing technical information on the many health and safety challenges faced by Grainger sellers and customers across North America. Prior to joining Grainger, she was the director of quality, regulations, and safety for two chemical manufacturers and compressed gas packagers, with safety being the primary focus. She is an accomplished writer, presenter, and trainer on occupational health and safety and industrial hygiene topics, is OSHA-30 hour trained for both construction and general industry, and is an OSHA Authorized Outreach Trainer for General Industry.

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CIRCLE 28 ON CARD

The Ripple Effect of Missed GHS Deadlines

How employers are experiencing the impact of the missed deadlines and what they can do to get on the right path toward full GHS compliance.

BY GLENN TROUT

The June 1, 2015, GHS deadline has come and gone. It was OSHA's intention that by now, chemical manufacturers and many distributors and importers would have reclassified hazardous chemicals according to the GHS-aligned requirements and updated all safety data sheets (SDSs) and labels to reflect these changes. Unfortunately, many chemical manufacturers took a wait-and-see approach to updates, which has now caught up to them and caused problems through the chemical supply chain.

The best way to think of the effect that missed GHS deadlines have on the supply chain is to imagine throwing a stone in a pond and watching the ripple. All of the deadlines are connected in a chain reaction that directly impacts how and when each change will be made downstream.

So what is the fallout of chemical manufacturers missing the June 2015 deadline, and how can employers effectively navigate around these missed deadlines? Before we get to that, it is important to review what is required for each of the deadlines first.

Overview of Passed GHS Deadlines

By now, all employees covered by the HazCom Standard should be trained on GHS and able to read and recognize the new SDS format and labels. The deadline for this was Dec. 1, 2013. However, employers should understand that this training requirement is an ongoing obligation. Workers must be able to comprehend the new GHS SDSs and labels and to also understand the ways in which these items work together as hazard information flows from one to the other.

One reason this first deadline was so important was that it laid the groundwork for the GHS deadlines that follow. If your employees haven't been trained on GHS, it is imperative that that training occur immediately.

The deadline that just passed—again, it was June 1, 2015—required chemical manufacturers to produce safety data sheets and labels using the GHS format. Under the new format, SDS documents now have a strict ordering of 16 sections. In the updated HazCom Standard, OSHA specifically outlines what information needs to be included on the documents and the order in which it should appear. Additionally, under

GHS, the hazard classification of chemicals now goes into more detail and includes the division of hazards into sub-categories based upon their severity.

Similarly, labels on shipped containers also underwent a dramatic format change and now require the inclusion of six standard elements. Manufacturers and other entities that ship hazardous chemicals from one facility to another must now include the appropriate product identifier, signal word, pictogram(s), hazardous statement(s), precautionary statement(s), and supplier information on the label of the immediate container being shipped.

Looming GHS Deadlines

The next deadline is Dec. 1, 2015. This is the date by which distributors can no longer send out hazardous chemicals labeled under the old (pre-GHS) HazCom Standard. OSHA granted certain distributors a six-month extension beyond the June labeling deadline to divest themselves of product already labeled under the pre-GHS HazCom Standard and to accommodate those suppliers with container shipments that may have been received too close to the June 2015 deadline to have the proper GHS labeling.

Unfortunately, with the number of chemical manufacturers who missed the June 2015 deadline, it will be difficult for many distributors to be fully compliant with the December 2015 deadline, as well. Regrettably, these delays will compound down the supply chain and only make it harder for employers to meet the fourth and final deadline on June 1, 2016. By this date, OSHA expects all employers to be fully compliant with GHS adoption, completing any necessary updates to hazard communication programs, including workplace labeling procedures. Additionally, all affected employees must be trained on any new hazards identified during the manufacturers', distributors', or importers' chemical reclassification process.

A 'Good Faith' Effort

OSHA revised the Hazard Communication Standard to align with GHS and laid out the compliance deadlines back in March 2012. Yet despite these clearly stated deadlines, many chemical manufacturers still missed important GHS deadlines, causing unpredictability for employers when it comes to safety data sheets and labels.

Earlier this year, OSHA anticipated GHS deadline issues and took steps to alleviate pressure felt by some chemical manufacturers that rely on upstream suppliers for chemical classifications. A Feb. 9, 2015, memorandum from Thomas Galassi, OSHA's director of enforcement programs, stated that OSHA inspectors

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should take into account overall efforts, attention, and action(s) taken to comply with GHS and the June 1 deadline. The memo is directed specifically at chemical blenders who missed the deadline due to upstream supplier delays.

With this document, OSHA stated that it might not cite manufacturers and distributors who fail to meet this deadline if they've shown "reasonable diligence" and made a "good faith" effort to comply. To make this determination, OSHA will review both oral and written communications between chemical manufacturers and their upstream suppliers of raw materials. OSHA also will factor in whether or not these efforts were made in a timely manner. To avoid a citation, non-compliant manufacturers and distributors will need to be able to tell an OSHA inspector when they do expect to be GHS compliant, with a specific timeline.

It's important to remember, though, that "reasonable diligence" and "good faith" protection won't last forever. In a presentation before the Society for Chemical Hazard Communication (SCHC) spring meeting in March, representatives from OSHA clarified that chemical blenders and distributors seeking relief from the June 1, 2015, classification deadline because they have not received data from their upstream vendors might be out of luck if they haven't already made documented attempts to obtain that information.

GHS is happening whether companies like it or not, and all efforts to adopt it must be made and should be completed sooner than later. That more manufacturers missed the June 2015 deadline directly affects the December 2015 distributor deadline, which will

only impede the efforts of downstream users even more.

The New Normal for Employers

So now the important question is, "What is the fallout of manufacturers missing the June 1, 2015 deadline for employers?" Unfortunately the impact of upstream suppliers missing their deadlines is that, for employers, the end is uncertain. It's difficult to predict when all chemicals in the United States will have fully GHS-formatted safety data sheets and labels. Until that time, employers will need to stay vigilant and understand that hazard communication unpredictability is the new normal for at least a while longer.

In the meantime, here are a few steps employers can take to keep their companies on the right path toward full GHS compliance and adoption:

- **Perform a chemical inventory:** Take inventory of the chemicals you currently have and verify that you have the most up-to-date SDSs for all of your hazardous chemicals. Even if these documents don't follow the new GHS format, having the most current information will make tracking the updates to your library much easier and alleviate risk to employees. There are a number of affordable electronic solutions that can help with managing safety data sheet updates. Many of today's electronic chemical management solutions not only automatically push updated safety data sheets to your account, but also allow you to filter by GHS and other criteria so you can get a quick snapshot of your GHS transition progress.

- **Train employees on GHS:** Having employees trained on

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the new GHS formats must be a top priority because they are the first line of defense in recognizing GHS-compliant SDSs and labels as they arrive. It's also important to remember that while your facility is transitioning to GHS, your library may contain a mix of safety data sheets in the new and old formats and that you must continue to train employees on both document types. Luckily, there are number of great on-demand GHS training courses that can help round out a comprehensive training program.

- **Capture safety data sheets:** Make sure that all points of entry into your facility are on the watch for updated SDSs and labels and establish a process to catalog updated documents that arrive. While this might seem like a basic task, it is the only way to guarantee your company is capturing SDSs in the new GHS format. Remember, chemical manufacturers and distributors are only required to send an SDS with the first shipment or the first shipment after a significant change has been made or when requested by a downstream user. If you miss the updated SDS, the onus then shifts to you to secure the updated document.

- **Update your SDS library:** As new safety data sheets arrive, make sure each document is saved in the SDS library for easy access. While cataloging these documents, employers also should identify any new information that requires updates to workplace labels and should communicate this information to employees. If new hazards are listed on the SDSs, employers should also update their hazard communication program to reduce any risks associated with those chemicals.

- **Train employees on new hazards:** As part of a compliant hazard communication program, employers need to train employees on any newly discovered hazards listed on safety data sheets and labels to make them aware of additional dangers and procedures to follow if contact is made. Employees also should have a solid understanding of the new GHS pictograms and be able to explain what each means.

- **Talk to suppliers about GHS:** The responsibility for communicating chemical hazards starts upstream with chemical manufacturers and ends with the downstream users. That said, as customers, downstream users can put a lot of pressure on upstream suppliers to get moving. And OSHA's expectation is that employers will play an active role in ensuring their employees have the necessary information to perform their jobs safely. Going forward, employers receiving SDSs in non-GHS formats should be proactive in communicating with suppliers about their needs and expectations and reach out to their local OSHA offices should they have trouble securing the necessary SDSs and labels.

Ultimately, We All Gain

Now more than ever, it's essential for employers to put procedures in place to review, identify, and categorize new SDSs and labels in the GHS format. We have a long way to go toward full GHS compliance. While the road may be challenging, alignment with global hazardous chemical communication practices should, in the end, drive safer workplaces for employees and their communities. **OKS**

Glenn Trout is the president and CEO of MSDSONline, a leading provider of sustainable cloud-based compliance solutions that help businesses of all sizes cost-effectively manage a variety of global environmental, health, and safety regulatory requirements. For more information, visit www.msdsonline.com or call 888-362-2007.

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Hazmat Identification, Control, and Emergency Response: The Fundamental Weakness in the System

The solution includes the development and use of electronic standards and methods for automatically identifying hazardous materials and waste.

BY JIM GIEMANSKI



Today, we see more and more catastrophic accidents involving hazardous materials, most recently rail accidents. One of the major factors involved in these types of accidents is the identity of the chemical involved. Is it explosive, toxic, or worse? What is the government doing to minimize these events? What are the chemical manufacturers, shippers, and carriers doing? The reality is that they are doing very little, considering the available technology to help reduce these dangerous vulnerabilities. One such technology is the *chain-of-custody* process involved in global supply chain control and the use of smart conveyances, whether they are trailers, containers, tankers, or rail cars.

A Fix to the Risks: A Chain of Custody

In jurisprudence and law enforcement, “chain of custody” refers to the integrity of evidence and requires a documented process showing the seizure, custody, control, transfer, analysis, and disposition of physical and electronic evidence. Documentation should include the conditions under which the evidence is gathered, the identity of all evidence handlers, duration of evidence custody, security conditions while handling or storing the evidence, and the manner in which evidence is transferred to subsequent custodians each time such a transfer occurs. This *Off the Shelf* (OTS) chain-of-custody technology can now be applied and used in the world of hazmat movements with the use and deployment of “smart” containers, trailers, and rail

cars using container security devices (CSDs).

1. Smart hazmat containers and conveyances provide the electronic equivalent of a receipt showing evidence of contents and evidence of shipping. The evidence is provided by a simple smartphone app or comparable electronic device useable only by an authorized and identified individual at the point of origin and at destination. Similar to the law enforcement officer collecting evidence, that person must be identified as the authorized person supervising the loading of the trailer, container, rail car, or tanker and verifying its contents and applicable identification code of the cargo or contents. At the time the electronic data or biometric information is inserted into the smart container system, there is a data transfer of logistics and hazmat data such as shipper and consignee, the identity of the hazardous material, and its Placard Number displayed by the carrier on the conveyance of the hazardous material. Within seconds of the arming of the CSD, the activation of the system takes place. The identity of the accountable person verifying the cargo’s accuracy and any data agreed upon will automatically be electronically transferred from the conveyance by satellite or cellular communications. Additionally, the electronic data contain the emergency response guidelines, which include the name of the hazardous material and the emergency response to the flammable, explosive, toxic, corrosive, infectious, or radioactive cargo. The CSD can also automatically provide first responders with the proper isolation and protective actions and safe distances necessary in the case of a spill or accident. It even can provide the location of an accident occurring in a remote location.

2. Depending on the robust nature of the hardware, the smart container provides a unique identifier for tracking and communication, which allows the consignee or consignor to “query” the container while it is in transit and also allows the container itself to report independently any movement off its intended journey. Satellite and/or cellular-monitored and -tracked smart containers automatically offer through the use of a worldwide call center’s third-party record of any break in the chain of custody. Essentially, the hazmat movement is monitored from origin to destination, reporting any anomaly in the movement, including any breach into the conveyance.

3. A smart container employing the chain-of-custody process can provide an electronic receipt of delivery, generated by the opening of the container at destination by a person approved and authorized to open the container or trailer. Its opening is accomplished by the specialized smartphone app or biomet-



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Circle 103 on card.

ric reading directly linked to an authorized individual at the point of destination.

The only real difference with the chain of custody described in other legal circles is that the smart containers can do all of this electronically. Smart containers not only meet the challenges of providing good control similar to a registered and certified letter in the postal system, but also they provide the electronic management not available in documentary chains, thus exceeding the demands of jurisprudence.

Worldwide Monitoring

These smart container security devices are able to provide electronic signals to monitor movement of containers internationally and domestically, from origin to destination. However, there is much more that CSDs can do than just report location. The user or their national and international control centers (“platforms”) can communicate with these CSDs, depending on the programming, sensors, and technology used in real time or close to real time. The very smart containers can tell you electronically:

1. The contents of the container
2. Who supervised loading the cargo and who is accountable for the accuracy of the contents at origin
3. The time the container was sealed
4. When it left origin
5. Its route
6. Its internal environment

7. Its progress
8. Whether it deviated from its course
9. Its arrival at port of embarkation
10. When it was loaded aboard the vessel
11. Whether it was breached
12. When it arrived at the destination port
13. Who opened it and verified the cargo

In addition, the use of CSDs with hazmat carriage can provide a means to safeguard those areas through which the hazmat travels, by the detection and transmission of any spill and the immediate proper response to that spill as required by the “North American Emergency Response Guidebook,” the official national guidelines for first responders during the initial phase of a dangerous goods/hazardous materials incident.

Control and Emergency Response: The Solution

The action of government regulatory agencies and competent hazmat producers and transporters are the solution. Additionally, the proper identification of hazardous materials, especially hazardous cargo as it moves throughout a state, is a sine qua non, or mandatory, requirement.

Present regulations only require the international UN hazardous materials numbers be used on the carrier’s bill of lading or shipping documents. Should a highway accident result in spills of hazardous materials and release of hazardous fumes, public safety depends on the knowledge of first responders. The first

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responders must immediately know the identity of the hazardous material in order to determine the proper emergency procedures to execute and to know how far to isolate the public from the hazardous material. This knowledge is contained in the hard copy of the guidebook and is published by the U.S. Department of Transportation. Every known hazardous material is numbered and links to a unique set of procedures. However, access to this guidebook is limited, and it may not be physically present in the equipment and vehicles used by first responders. In practice it is often somewhere in the trunk of a police car or somewhere in an emergency vehicle.

Specifically, access to "what to do" is a real threat for first responders if the guidebook cannot be immediately found and utilized. Even its use requires knowledge of how to use it and the time it takes to find and read how to implement procedures recommended in the guidebook.

The solution includes the development and use of electronic standards and methods for automatically identifying hazardous materials and waste and concomitantly to provide emergency response information in the case of an accident. The essential element of solving the hazmat problem is the modification of the guidebook into electronic data unique to each hazmat movement. These data are then available for inclusion into the CSD and the servers of the control centers that monitor movement on a 24/7 schedule. Specifically, the CSD will automatically alert the appropriate state agencies of the identity, emergency procedures, and isolation procedures through current software used by a state's law enforcement and emergency responders, should a spill occur.

The CSD clearly supports hazmat control and proper response should any spill occur by providing the following:

- Identification of the hazardous materials
- Detection and reporting of any deviation in planned route of movement of conveyance
- Detection and reporting of any breach into the conveyance
- Satellite and/or cellular location monitoring of origin to destination movement
- Automatic reporting of hazmat arrival at destination
- Automatic detection and reporting of a spill, its location, and all emergency response information contained in the hard copy of the guidebook linked to the subject hazmat

CSD usage clearly allows for quicker determination of a spill and the appropriate emergency response procedure, especially if a driver is incapacitated or otherwise unable to report a spill, particularly in a remote location. Given the cost savings resulting in not having to equip all state police cars with the guidebook, this proposal should amount to a net savings for state agencies. It is time that state and federal requirements demand the use of this chain-of-custody technology. What's taking so long? **OHS**

Dr. Jim Giermanski is the chairman of Powers Global Holdings, Inc. (Belmont, N.C.) and president of Powers International, LLC, an international transportation security company. His recent book is entitled "Global Supply Chain Security" (Scarecrow Press 2012). He served as Regents Professor at Texas A&M International University and as an adjunct graduate faculty member at the University of North Carolina at Charlotte. He was director of Transportation and Logistics Studies, Center for the Study of Western Hemispheric Trade, at Texas A&M International University.

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Three Hazmat Rules Every Employee Can Remember

Teach employees to get into the good habit of reading every label every time they pick up or pour from a container.

BY KAREN D. HAMEL



Ulrich Mueller/Shutterstock.com

While it might be impressive to show slides of perfectly balanced chemical equations and review a dozen case studies in training, most people won't remember them after five minutes, let alone five days. And, really, do they need to? Will those slides and studies help the employees remember to wear their personal protective equipment (PPE) or remind them to check a pressure valve? Will they actually help make the workplace safer?

The ultimate goal of training is to increase understanding and ability. Keeping trainings simple facilitates this goal—especially when it comes to working with hazardous materials.

Some safety regulations have timed training requirements to ensure that employees will have ad-

equate time to learn the things that they need to know to perform their jobs safely. Many regulations, however, do not, which doesn't mean that the hazard is unimportant or that training can be taken lightly. But it does mean that training can be more easily tailored to fit the needs of the facility and the employees.

From Millions to One

According to the Chemical Abstract Service, more than 97 million chemical substances are currently registered. Chances are, no single facility has all of these chemicals on site, but most facilities do have hazardous materials that are stored, managed, and/or used throughout the site. With each hazardous chemical comes the requirement to properly train employees so that they can work with and manage it safely.



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Teaching employees to handle and use each chemical safely does not require them to carry around volumes of manuals or countless handouts.

For facilities with large numbers of hazardous chemicals on site, it can take some time to prepare trainings that address the specific hazards of each chemical. In addition to the hazards of the chemical itself, processes that utilize those chemicals may also present unique hazards.

Fortunately, many chemicals can be grouped into classes. For example, most solvents are flammable. If 10 different flammable solvents are used on site, the hazards of each solvent are similar, and the process where they are used is the same, it probably makes sense to train employees to handle those solvents in the same manner instead of having a unique set of procedures for each of the 10 solvents.

Even though chemicals may be similar, it is still important to handle each of them safely. But as employees recognize similarities between chemicals, it can make it easier for them to remember how to safely handle each of them.

Chances are good that even after years of training, many employees still will not be able to list all of the ingredients in complex chemical mixtures. But if they know the following three rules, they can still work with hazardous chemicals safely.

Rule #1: Follow the Plan

The Occupational Safety and Health Administration (OSHA) requires facilities to assess hazards in their workplaces. When hazards are identified, plans and procedures must be developed and put in place to prevent those hazards from harming employees. Plans outline the standard operating procedures or processes that employees need to follow to safely handle hazardous chemicals in a manner that prevents harm.

Following the plan may involve checking valve fittings, hoses, or pipelines for leaks before starting a process. It may include checking air monitoring devices. It could detail wearing the appropriate PPE or storing hazardous materials properly when they are not in use. Chances are good that even when many different hazardous chemicals are in use, the plans for handling each type may be similar.

Plans and procedures that are clear and easy to follow are a key to working safely with hazardous materials. If the plan is complex, enlist the help of employees who are involved in the process to simplify it until it makes sense and everyone is not only able to follow the steps, but also understands why each is necessary to ensure their safety.

Rule #2: Read the Label

Performing the same routine all day every day usually forms habits. Teach employees to get into the good habit of reading every label every time they pick up or pour from a container. This will help focus their attention on making sure that they are using the right product for the job and minimize the chance for unintentionally exposing themselves to a hazard or causing an unintended chemical reaction.



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OSHA's adoption of the globally harmonized standards for labeling chemicals (GHS) has changed the way hazardous chemicals are labeled. By now, everyone should be trained to identify all of those new pictograms, be familiar with hazard statements, and be able to recognize the other new labeling elements. But these precautions are meaningless if no one takes the time to stop and read them.

Rule #3: Pay Attention

Complacency is a common cause of unsafe acts. It can include not having eyes on the task, daydreaming, or being otherwise preoccupied.

Complacency also can come from working safely with hazardous chemicals for so long that the perception of their true danger is minimized. This can make it difficult for workers to pay attention to tasks, which can lead to near misses and incidents.

Employees need to be reminded of the dangers that hazardous materials present in their work areas. Labels and signs can help with this, but they should not be the only reminders. One way to keep chemical information fresh in employees' minds is to review a single safety data sheet at weekly safety meetings or during toolbox talks.

While it is essential to teach employees how to work with hazardous materials safely, it is also important to teach them what to do when things go wrong. This training may include knowing the signs of exposure, emergency shutdown and evacuation, use of specialized PPE, first aid, or other specialized procedures.

Teaching employees to handle and use each one safely does not require them to carry around volumes of manuals or countless handouts. Employees who remember to follow established plans, read labels, and pay attention to the task at hand will be able to handle and manage hazardous materials safely. **OHS**

Karen D. Hamel is a technical specialist for New Pig Corp. She has more than 20 years of experience helping environmental, health, and safety professionals find solutions to meet EPA, OSHA, and DOT regulations. She is a hazmat technician, serves on the Blair County, PA LEPC, is a CERT trainer, and has completed a variety of hazmat response and NIMS courses, including Planning Section Chief. She can be reached at 1-800-HOT-HOGS® (468-4647) or by email to karenh@newpig.com.

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CIRCLE 44 ON CARD

The More Things Change...

Training about a company's respiratory protection program and the uses and limitations of the respirators in use is still training, even if more delivery options are available.

BY GREG ZIGULIS

It was in about 1987 that I had my first solid introduction to respiratory protection concepts, through an American Industrial Hygiene Association class taught by someone who was an old veteran in it. I loved how logical it all seemed when explained by an expert.

That was a long time ago. Some things have changed so much since then!

- The quality of and options available for respirators and related products are better than ever.

- Medical clearances for the wearing of respirators "can" be easier through online completion of respirator questionnaires coupled with the review and (if medically warranted) in-person follow up by a physician or other licensed health care professional.

- While at one time it seemed as though many hospitals were not "open" to the need for NIOSH-certified respiratory protection, now there is a detailed hospital guide, "Implementing Hospital Respiratory Protection Programs: Strategies from the Field" (The Joint Commission, 2014, with support in part from NIOSH). This even includes references to increasing the efficiency of respiratory protection programs using Lean Six Sigma concepts.

- The new ANSI/ASSE Z88.2 - 2015 (just published) contains some information not in prior versions and has, for example, notes about bioaerosols, guidance on the establishment of cartridge and canister change schedules, and "effective fit" concepts.

Current discussions about ISO respirator standards in development that would provide different respirator classifications and "selection and use" criteria could be impactful down the road.

So the selection and use of respiratory protective devices and respirator program requirements *could* seem daunting. However, basic principles remain the same. For example:

- Identifying and evaluating the respiratory hazard is still identifying and evaluating the respiratory hazard. When NIOSH suggests there is a need for better evaluation and protection to persons involved in fracking operations ("beyond respirable silica"), the issue is the same: recognition, evaluation, and control, including through the selection of respirators based upon evaluated hazards.

- Fit testing is still fit testing, although testing

equipment has become more easily available and/or new methods have been developed (quantitative fit tests using ambient aerosol, generated aerosol, and controlled negative pressure).

- Training about a company's respiratory protection program and the uses and limitations of the respirators in use is still training, even if more delivery options are available.

Some respirator applications may call for a sophisticated approach to exposure assessment, and there can be issues requiring technical assistance. However, when it comes to the overall development and implementation of an employer's respiratory protection program, there are some program content considerations that are common among industries. I've described a few of those considerations in a martial arts context.

Program Content Considerations

I remember learning a principle from a karate instructor many years ago that I've kept in mind ever since. The principle was that of practicing and perfecting a variety of "basics" (techniques, approaches, methods) and relying upon them for competition and real-world (although hopefully you'd never have to use it) applications. Techniques were selected based upon how you were able to "read" your opponent, and good prior training permitted you to respond flexibly with well-honed skills. Students from other schools sometimes used more exotic moves that looked really cool in "show" but were not always perfected or practical; the students who stuck closer to their basics were the ones who won.

To me, applying those concepts to respiratory protection program content and requirements translates into:

Exposure assessment is like "reading" and understanding your "opponent."

- Describe in your written program how your company will assess the materials and exposures that potential respirator wearers need or may need protection from. There are many different techniques, tools, and thoughts about how much data are needed—this is where "art and science" are needed by a qualified person.

- Work conditions and processes change, just as a fight opponent can. Plan to re-assess as processes and materials change.

Respirator selection is a bit like choosing your fighting technique based upon your opponent:

- Describe what you will be protecting employees against, how you will be sure respirators are se-

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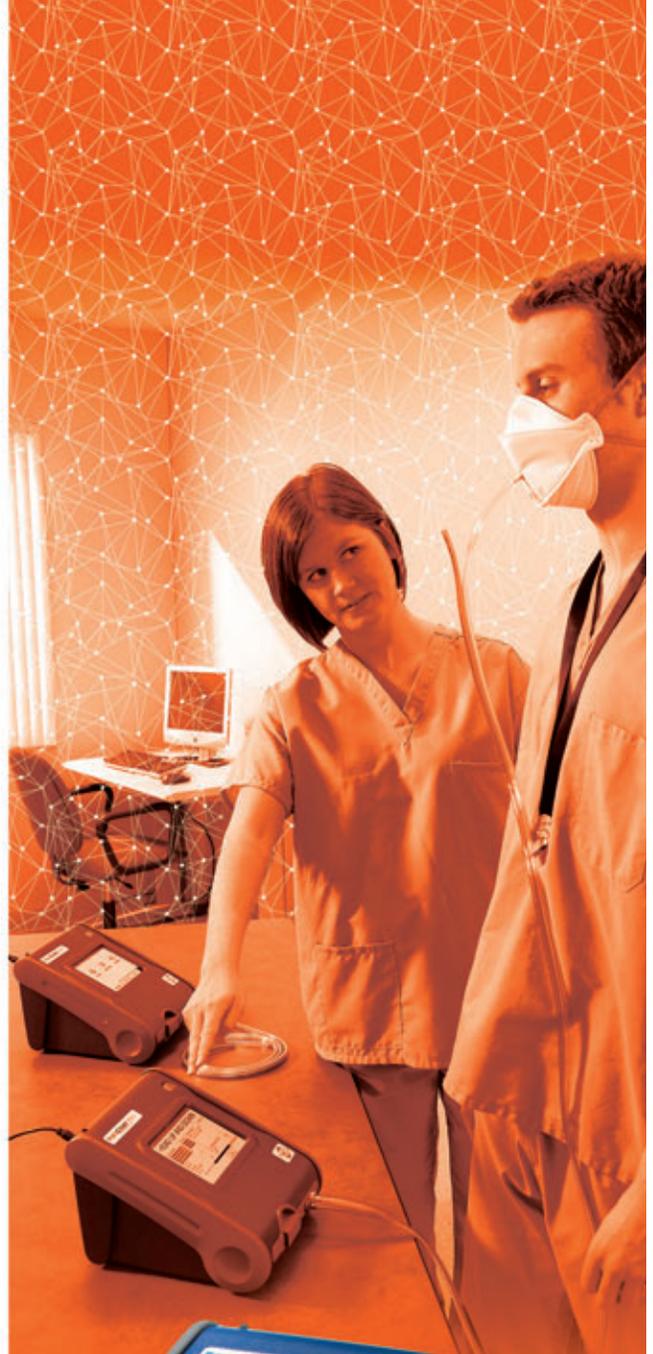
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CIRCLE 39 ON CARD



Work conditions and processes change, just as a fight opponent can. Plan to re-assess as processes and materials change.

lected the right way, and options.

- How will your company handle “uncertain” data and requests for issuance of respirators before data are available?

Advance program policy determination can be analogous to advance preparation and flexibility of response:

- Know whether you will permit “voluntary use” of respirators, and if so, how that will work.

- For reusable facepieces, know where you will set up cleaning stations/locations, which exact supplies will be used, and where facepieces will be dried and stored.

- Know how you will control the selection and issuance of respirators and corresponding supplies.

- Have your medical clearance process defined and expect potential employee concerns.

- Define your PAPR policy, if you will use PAPRs. Will you issue and encourage PAPRs for certain types of work, even if that level of protection is not needed—perhaps for the sake of increased wearing of respirators or for other types of protection (for example, integral hard hat protection)?

Sticking to the basics, you might want to work with your em-

ployees to establish a reasonable but limited set of selection options. For any one particular hazard, there can be many protection options, some more costly than others; the more the options there are, the more the potential confusion and room for error. Define what is needed for what, establish a few options, and communicate those options in a simple way.

These are just some considerations. There are many resources that can be found on the web. There is an excellent list of resources at <https://www.osha.gov/SLTC/respiratoryprotection/guidance.html>. Respirator manufacturers’ and suppliers’ websites can have great information, especially with regard to selection tips and cartridge changeout schedules. Of course, appropriate regulations need to be consulted (see 29 CFR 1910.134 where OSHA applies, 30 CFR 56/57.5005, 30CFR58.610 where MSHA applies, etc.)

Implementation

As we all know, the best written program can fail if it is not rolled out well. Resistance to implementing a new and managed program will depend upon a company’s leadership approach and cultural maturity. Different approaches will be needed in different organizations.

If you are hearing things like “I heard if I put Vaseline over my sideburns and beard, I won’t need to shave” and “All I want to do is wear this dust mask; forget the training and program, I’ll just go to the local hardware store,” then that might need to be approached

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Have your medical clearance process defined and expect potential employee concerns.

differently than for other companies.

Employees can have implementation concerns that turn into roadblocks that may not always be articulated well. These can include concerns about favored brands and models, who can buy what, the perceived “value” of the respirator medical clearance process, and length of training. However, there are some things that can be kept in mind and acted on as part of a program rollout to help overcome obstacles.

■ Consider using a very deliberate rollout strategy that includes significant advanced planning and communication with the management team and a broader group of employees. While there are legal “must-do’s,” employee buy-in is very important. Certainly, just “selecting” some respirators and saying “here they are” and “here’s the program” is not likely to work well.

■ Help groups of employees see the need for change in personal and emotional terms. One of the more effective program rollouts I saw recently occurred after a group of employees heard a passionate presentation about “breathing safety” by someone who thought his illness had been created by his exposure to fumes over the course of his career. Those employees came back “asking” for an improved program.

■ Consider applying proven models for making change, as applicable. One famous model is that described in *Leading Change* by John P. Kotter. His eight steps model includes establishing a sense of urgency; working with a team of people who will be champions of change; creating and communicating (in multiple ways) a compelling vision; making changes to organizational systems, processes, and structures; achieving early, short-term wins to build momentum and confidence; and ensuring that new metrics are in place that can help provide business alignment.

■ Another idea to consider is that of “enhanced organizational depth perception” articulated by Robert Pater in the May 2015 edition of *Occupational Health & Safety*.

■ You might find other implementation ideas that are interesting that you could apply to respirator or other safety related programs in *Contagious: Why Things Catch On*, by Jonah Berger.

■ Ultimately, help people feel confident in “their” respiratory protection program.

Conclusion

Respiratory protection program basics haven’t changed much, although the tools available to us have improved dramatically. Be careful how you develop and roll out programs, which can arguably be just as important as the content of your program. Only with good attitudes and buy-in can

we take advantage of the great improvements made available to us over the years. Good luck with your programs. **OHS**

Greg Zigulis, CIH, CSP, is President of Sixth Sense Safety Solutions and provides companies with comprehensive occupational and industrial health and safety assistance. Over the span of his 30-year career to include construction, manufacturing, restoration, and mining, he has helped numerous organizations with respiratory protection needs and applications. He can be reached at gz@sixthsensesafety.com.

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OSHA-Related Documents: Creation and Retention

It is important to note that any documents produced can be utilized to issue citations, thus, the employer should not produce any documents unless required by law.

BY MARK A. LIES II AND ILANA R. MORADY

As most employers are aware, OSHA inspections typically involve a request for the employer to produce certain documents. In many cases, employers are unsure of what documents the compliance officer is entitled to see and copy. Employers can also be unsure of how long to retain certain documents required under OSHA. Some OSHA regulations require a specific retention period for documents. Other OSHA regulations, however, do not (although it is often advisable to retain certain documents even if retention is not technically required). This article is intended to give general guidance in these areas.

Categories of Documents

The following list sets out some of the typical OSHA standards and the General Duty Clause that may require an employer to create, retain, and produce certain documents during the course of an inspection, if requested by the OSHA compliance officer. Obviously, whether the employer is required to have certain of these programs or others will depend on the nature of the work activities at the site. This list is focused on the standards that are applicable to employers in general industry (29 CFR 1910 et. seq.) and not construction (29 CFR 1926 et. seq.), although some general industry standards are substantially similar and also applicable to the construction industry. There are many hazards that are common to each industry, but the regulatory obligations frequently differ. For employers in the construction industry, it will be necessary to reference the existing regulations addressing hazards in that industry when responding to an OSHA document request.

During the inspection, the employer should request the compliance officer to make the document request in writing (it can be handwritten) so there is no confusion over what documents are being requested and so the employer is not cited for failure to produce a document it did not believe was requested by the compliance officer. The employer's on-site representative should review this request with management and decide which documents will be produced to the compliance officer. It is important to remember that the employer has no duty to produce certain documents (e.g., post-accident investigations, insurance audits, consultant reports, employee personnel in-

formation) because no regulation requires such production. It is important to note that any documents produced can be utilized to issue citations, thus, the employer should not produce any documents unless required by law.

Control of Hazardous Energy—Lockout/Tagout (LOTO)

■ 29 CFR 1910.147 requires the employer to develop procedures to protect employees who service or maintain its machines against unexpected energization or start-up of equipment or release of stored energy.

■ 29 CFR 1910.147(c)(7). The employer must train its "authorized" employees how to perform LOTO with these procedures, as well as "affected" employees who may be exposed to the equipment.

■ 29 CFR 1910.147(f)(2) requires the on-site employer and outside employer to inform each other of their respective lockout or tagout procedures.

Document retention: The LOTO standard requires employers to certify that periodic inspections have been performed at least annually. Accordingly, employers should retain certifications for one year or until a new certification is created. It is also advisable that employers retain employee LOTO training records for the duration of employment.

Occupational Noise Exposure

■ 29 CFR 1910.95 requires the employer to provide a hearing conservation program (education, annual audiograms, hearing protection) for employees who are exposed to noise levels equal to or exceeding an eight-hour time weighted average (TWA) of 85 decibels on the A scale. The employer must conduct a noise survey to determine those jobs that may require employees to be included in the program. Employees who suffer hearing loss at certain frequencies must be included on the OSHA 300 Log. The employer must develop a written program and administer it.

Document retention: Employers must retain noise exposure measurement records for two years. Employers also must retain audiometric test records for the duration of the affected employee's employment.

Personal Protective Equipment (PPE)

■ 29 CFR 1910.132. The employer must conduct an initial certified hazard assessment of the workplace to determine whether hazards are present that require personal protective equipment for eyes, face, head, and extremities to protect against injury. The employer must provide each employee with the necessary PPE, train the employee in the use of PPE, and enforce its use. The employer must pay for the PPE with limited exceptions.



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A second certification is required to confirm that the PPE was provided, the employee received training in how to utilize it, and that the employee “understood” the training.

Document retention: Employers should retain the written certifications of a hazard assessment and employee training for the duration of employment for all employees exposed to identified hazards. It is also advisable for employers to retain employee PPE training records for the duration of employment.

Hazard Communication (Employee Right to Know)

■ 29 CFR 1910.1200 requires the employer to develop a written hazard communication program to protect employees against any hazardous chemical that presents a physical or health hazard. The employer is required to conduct an assessment to determine which hazardous chemicals may be present, to inform employees of the presence of the hazardous chemicals, and train employees on how to read a Safety Data Sheet (SDS) for each hazardous chemical.

Employees are entitled to access to the SDSs and to obtain copies.

Document retention: Employers must retain SDSs for the duration of employment plus 30 years for all employees exposed to the chemical in question, unless there is some other record of the identity of the substance or chemical, where it was used, and when it was used. The employer must also be sure it has a copy of all SDSs for all chemicals that are currently in use. It is also advisable for employers to retain employee hazard communication training records for the duration of employment.

Process Safety Management

■ 29 CFR 1910.119 requires employers who utilize certain toxic, reactive, flammable, or explosive chemicals in certain quantities to develop a written 14-part PSM program. The PSM program addresses all aspects of work around the covered “process” that utilizes the chemicals.

■ 29 CFR 1910.119(h) requires training of contractor employees who perform certain work around the covered process concerning the hazards and elements of the PSM program.

Document retention: Employers must retain process hazard analyses (PHAs) for the life of the covered process. In addition, the employer must prepare a written record that each employee who is involved in the operation of the process was trained and understood the training. These verification records should be retained for the length of the employee’s employment. We recommend that employers also retain all process safety information (PSI) used for developing, maintaining, auditing, and otherwise managing all processes for the life of the processes. Any incident investigation conducted under the PSM standard must be retained for five years. Additionally, employers must retain the two most recent compliance audit reports conducted under the PSM standard.

Emergency Action Plans

■ 29 CFR 1910.38 requires the employer to develop an emergency action plan (EAP) to protect employees against the hazards of fires or other emergencies. The EAP must include provisions for report-

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ing a fire or other emergency, evacuation procedures, and the alarm system. The employer must train each employee. (29 CFR 1910.38(e))

Document retention: There are no specific document retention requirements under 29 CFR 1910.38, aside from the requirement that employers develop and maintain a written EAP. If the employer has 10 or fewer employees, the plan does not have to be in writing.

Fire Extinguishers

■ 29 CFR 1910.157 requires the employer to provide fire extinguishers and mount, locate, and identify them so that they are readily accessible to employees.

If employees are expected to use the fire extinguishers, the employer must provide training upon initial employment and at least annually thereafter. The employer must develop an educational program if it expects the employees to use the fire extinguishers. Many employers specifically prohibit employees from using the fire extinguishers to avoid this training obligation.

Document retention: If the employer permits the employees to use the fire extinguishers, the educational program and training should be in writing and maintained for the length of employment.

Permit-Required Confined Spaces

■ 29 CFR 1910.146 requires the employer to identify all confined spaces within the workplace that employees or outside contractors may be required to enter and contain a hazardous atmosphere, engulfment hazard, an internal configuration that could trap or asphyxiate an entrant, or other serious safety or health hazard. The employer must develop a written program and procedures for employees who enter the confined spaces. Only trained and authorized employees can enter the space.

■ 1910.146(c)(8) requires the host-employer to provide certain information to other contractors who will have their employees enter the space.

Document retention: Employers must retain each canceled entry permit for at least 1 year and review them within one year after each entry. It is also advisable to retain employee confined space training records for the duration of employment.

Respiratory Protection

■ 29 CFR 1910.134 requires the employer

to conduct an assessment of the workplace to determine whether there are harmful dusts, fumes, mists, sprays, or vapors which may create a respiratory health hazard. If there are such hazards, the employer is required to develop a written respiratory protection program, to evaluate employees to determine whether they are physically capable of wearing a respirator, to provide such respiratory protection at the employer's cost, and to train employees how to wear and maintain respiratory protection. The employer must enforce the use of the respiratory protection.

Document retention: Employers must

retain records of employee medical evaluations for the duration of employment plus 30 years. Employers also must retain fit test records for respirator users until the next fit test is administered.

Electrical Safety (Safety-Related Work Practices)

■ 29 CFR 1910.331-.335 requires an employer who will permit its employees to perform work on or in the vicinity of exposed energized parts (which cannot be locked out and tagged out) to provide extensive training in the hazards of working on or in the vicinity of live electrical equip-

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ment, protective clothing, and insulated tools and devices. The employer must designate employees as “authorized” in order to perform such work or “unqualified,” in which case such employees cannot perform such work. The employer may be required to conduct an electrical exposure hazard survey of electrical equipment under NFPA 70E in order to determine what PPE should be used, what training is necessary, and to otherwise be in compliance with OSHA safety requirements.

Document retention: OSHA’s electrical safety standards do not have any specific record retention requirements, however, it is advisable to retain employee training records under these standards for the duration of employment. If an employer conducts an electrical exposure hazard survey, the employer should retain it for as long as the hazard exists.

Access to Employee Exposure and Medical Records

■ 29 CFR 1910.1020 requires the employer to inform employees of their right to have access to all records maintained by the employer that reflect an employee’s exposure to any toxic substance or harmful physical agent (e.g., chemicals, dusts, vapors, noise, mold, etc.) or any medical records the employer maintains on an employee, except for certain exceptions. Employees are entitled to have access and to obtain a copy at the employer’s expense.

Document retention: Employers must retain employee exposure records for the duration of employment plus 30 years. If the employer maintains certain employee medical records, the employer

must retain them for the duration of employment plus 30 years.

OSHA 300 Log of Work-Related Fatalities, Injuries and Illness

■ 29 CFR 1904.0. The OSHA 300 Log must be maintained by employers unless there is an exemption, based on the NAICS code or the size of the employer. The employer is required to record on the Log, within seven calendar days, each fatality, injury, or illness that is recordable under OSHA definitions. The host employer is required to enter into its Log the injuries or illnesses of outside employees at the work site under certain conditions—for example, temporary employees who are under the direction and control of the host employer.

Document retention: The OSHA Log, the annual summary, and the OSHA Incident Report forms must be retained by employers for five years following the end of the calendar year that these records cover. The OSHA Log must be maintained on an “establishment basis” based on NAICS codes. It is possible that employers may have some “establishments” where a Log must be maintained and others where maintaining a Log is not necessary.

General Duty Clause

■ Section 5(a)(1) of the OSH Act requires an employer to identify “recognized hazards likely to cause serious injury or death” to an employee, which hazards may not be regulated by a specific OSHA regulation, and to take “feasible” actions to abate or correct such

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hazards. This duty can be based upon the “recognition” of the hazard in the employer’s own, existing programs or within the employer’s industry.

Some examples of this legal obligation may be: ergonomics, heat illness, workplace violence, or combustible dust.

Document retention: While there are no specific standards for “recognized hazards” covered under the General Duty Clause, and thus no specific record retention requirements, it is advisable for employers to retain any training records it has developed addressing any “recognized hazards” for the duration of employment, including the written policy, training records, and documents that evidence discipline for violation of the policy. Remember that certain documents related to General Duty Clause obligations also may fall under exposure/medical recordkeeping requirements (see Electrical Safety, above).

Disciplinary Records

There is no regulation that requires an employer to maintain written records of employee discipline for violations of the employer’s safety and health policies. If, however, the employer wants to credibly assert the “unavoidable employee misconduct” defense to avoid liability for OSHA citations, the employer is highly recommended to maintain written records of discipline indicating the nature of the violation, the date, the name of the employee who committed the violation, and the name of the supervisor who imposed the discipline. This same documentation can be useful in the event that the employer has to defend an employment discrimination or wrongful termination action by being able to prove the action was based on a legitimate non-discriminatory reason—that is, violation of safety and health policies.

Conclusion

In addition to the summary of OSHA-related documents discussed above, there are numerous other OSHA regulations that may have document retention requirements. If an employer is subject to any of these regulations, the regulations must be reviewed and appropriate document retention procedures must be developed.

Remember that it is critical that an employer control the flow of information during the inspection, including the information contained in documents. By avoiding

production of documentary evidence that is not required by law, the employer reduces the potential for regulatory citations. It is also critical that employers understand what documents they are required to create and retain.

Even when an OSHA standard does not specify how long certain records must be retained, it is advisable to consider retaining such records for a significant length of time. For example, many OSHA standards require employee training but do not necessarily require documentation of training or retention of training documents. Nonetheless, it is advisable to prepare and retain

training documents for the duration of employment because training documents are often indispensable in asserting certain defenses to citations. **OSHS**

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Plan, Prepare and Recover: How Businesses Can Manage Through Emergencies

Smaller companies often struggle, not knowing where to turn or having the budget to develop a robust business continuity plan.

BY TOM HENEGHAN

Most people would expect a company that contracts with the American Red Cross on emergency preparedness programs and is headquartered in St. Louis, Mo., a region of the country prone to severe weather, to be prepared for pretty much anything.

But E.J. Brewer, president of Golamac, Inc., acknowledges that wasn't always the case. "A couple years ago we weren't sure that we were as ready as we could be," he admitted. "But we did know that we wanted to walk the talk not only with the Red Cross, but with all of our clients."

Businesses face a number of emergencies that could disrupt their operations, ranging from natural disasters such as tornadoes, hurricanes, and floods to outbreaks of illness, such as the flu. Yet the *Journal of Accountancy* reports that 62 percent of small U.S. businesses have not established a formal plan for responding to a natural disaster or another emergency.

The danger of not planning ahead means that many businesses don't ever bounce back after a disaster. The Insurance Institute of Business & Home Safety estimates that 25 percent of businesses do not reopen following a major event, and others, including the U.S. House of Representatives' Committee on Small Business, believe that figure could be even higher.

Companies often send out an all-staff email if bad weather is predicted, but would employees really know what to do in a serious emergency, be it related to nature or man-made? Does the company have a plan about how to carry on some level of business operations if a weather event disrupted power, water, office operations, or other services? And while some employees might be able to telecommute, what is the plan should they be forced to shelter in place at the office, separated from their own families during a time of duress?

Erika Voss, lead senior business continuity manager for Microsoft Corporation, believes that events can become catastrophic when the people working them do not get in front of the event and address it very quickly, calmly, and with a specific timeline on how the event will be handled. "The irony is that we are trained to communicate first, but if you don't have a plan of what and how you are going to continue for



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the business, then how can you communicate in the crisis what is going to take place next?" she added.

The phrase "business continuity" is very much self-explanatory: the ability to "continue" the business regardless of the event. Developing a business continuity plan involves a deep understanding of one's business, one's environment, and what is critical to the leadership team. It is knowing what and where the breaking points are inside an organization and building a plan to respond, recover, and continue to do business. This includes identifying people who will be part of the response team and having the right support structure in place to recover.

Large companies such as Microsoft employ business continuity experts such as Voss to help them plan and prepare for myriad disruptive events. Smaller companies often struggle, not knowing where to turn or having the budget to develop a robust plan. Even after Hurricane Sandy devastated the New York metropolitan area in 2012, the Spring 2013 Small Business Owner Report found that less than half of New York business owners said they had a plan in place to deal with unexpected events.

Developing a Plan

Tools exist that offer guidance on the process, enabling businesses and organizations to measure how ready they are to deal with emergencies. The self-paced Red Cross Ready Rating program, for example, begins with an assessment of whether a business or organization is prepared to handle a disaster. Sponsors support the free program, which currently services more than 12,000 members, the majority of them small businesses.

Ready Rating participants score themselves on how prepared they are and receive steps they can take to improve their readiness planning. The assessment covers items from hazard vulnerability to continuity of



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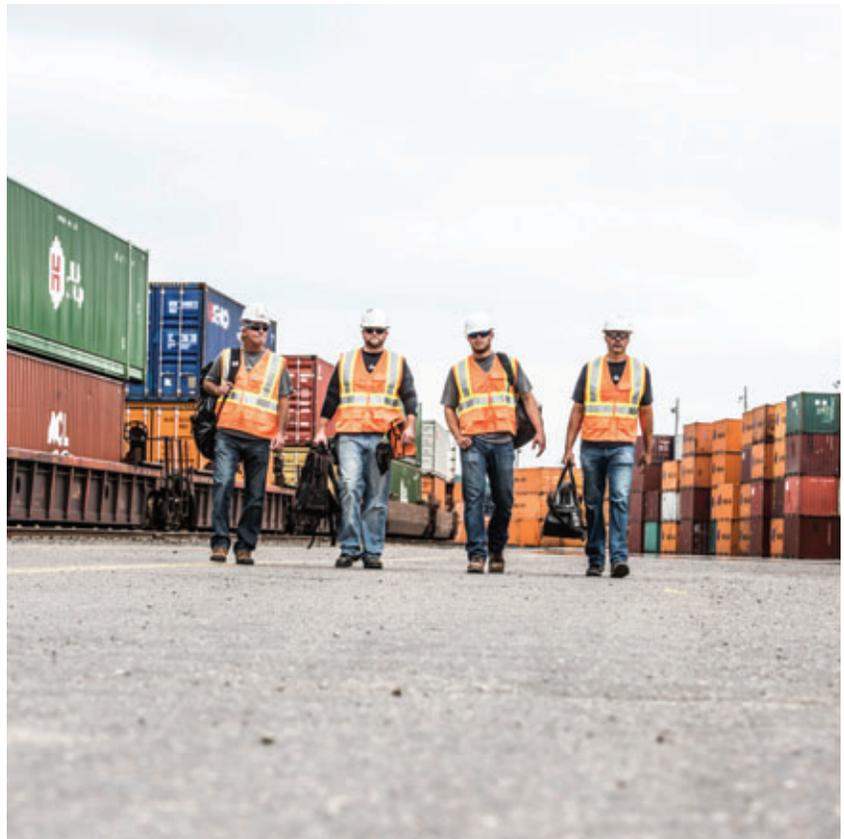
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operations and employee readiness. Small companies can complete a tailored 25-question assessment; a more comprehensive, 60-question assessment earmarks larger businesses. Based on the responses, the program gives customized feedback on how to improve. The program is also consistent with the Private Sector Standards developed by the Department of Homeland Security.

“Continuity planning can help save lives as well as livelihoods when disaster strikes,” said Dom Tolli, vice president of the Preparedness and Health and Safety Services division within the Red Cross. His words echoed a 2013 survey of Ready Rating companies that had experienced a disaster or emergency in the previous year. In their responses, 67 percent indicated the actions they took as a result of the Ready Rating program helped them reopen their business more quickly.

Once a business continuity plan is in place, experts recommend that the plan be supplemented with regular drills for different types of emergencies. These could be as simple as quarterly fire drills and evacuations, to something more focused, such as holding practice exercises for staff who are trained in first aid, CPR, and AED use and can serve as first responders in the event of an emergency.

The Roles of Business Continuity and Crisis Management

Business continuity experts observe that many companies mistake crisis management and business continuity as the same thing. In fact, they are two different pieces of a puzzle that need to interlock seamlessly at a frantic moment in time. Business continuity addresses potential interruptions upfront, ensuring that there is a plan built around people, process, and anticipated infrastructure. Crisis management is defined as the direct, hands-on experience dealing with an

incident, disaster, or catastrophic event, regardless of size, complexity, or nature.

Because most companies designate separate units for business continuity and crisis management, they then fail to put the teams together to review the plan on a regular basis, a practice that is gaining in popularity, Voss said. Organizations must be clear on defining the roles and responsibilities for team members; once the pillars are in place, the partnership can then be built so that the first time these critical respondents come together is before an emergency, not during it.

Integrating Social Media and Apps

Within the past decade, businesses and response organizations alike have had to adapt to and incorporate social media into planning. Social media channels and smartphone apps will only grow in popularity as younger, tech-savvy generations rely on these tools to communicate. Companies must learn to build response efforts around channels such as Twitter and Facebook because they will continue to serve as a major source of news and information. Further, reactions and feedback, already rapid on social media and apps, will only grow in reach and speed.

The importance of business continuity and emergency planning is succinctly summed up by Brewer of Golamac, Inc.: “I have a responsibility to my employees and my customers to put a plan in place to keep this company going after a disaster,” he said.

OHS

Tom Heneghan Senior Manager-Preparedness and Health & Safety Services for the American Red Cross, manages its Ready Rating and health and safety training programs. For more information about Ready Rating or first aid, CPR, and AED training, visit redcross.org.

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OSHA's New Confined Space Standard

It is generally agreed that this new standard was written to mirror many facets of its general industry counterpart.

BY CHRIS IRWIN AND JESSICA SMITH



NSA

Since it was issued in 1993, OSHA's confined space regulation, 29 CFR 1910.146, has been geared toward general industry workers, with very little applying directly to the construction industry. Employers in the industry have tended to default to general industry standards but have not had a substantial regulation of their own to fall back on. On Aug. 3, 2015, however, the OSHA confined spaces in construction standard, 29 CFR Subpart AA 1926.1200, joined the existing general industry confined space standard and clearly defined rules for confined spaces in construction. It is estimated that this move can prevent roughly 780 serious injuries and five deaths each year.¹

At a confined spaces press conference on May 1, 2015, Dr. David Michaels, assistant secretary of Labor for OSHA, stated, "This rule will save lives of construction workers. Unlike most general industry work sites, construction sites are continually evolving, with the number and characteristics of confined spaces changing as work progresses."² He added that "all workers

have the right to a safe and healthy workplace, and it only makes sense that all workers have similar protections when working around the same hazards."³

Confined Space vs. PRCS

First, let's define a confined space. A confined space is a space large enough for a worker to enter, is not designed for "continuous employee occupancy," and has limited means for entry and exit.⁴ A permit-required confined space (PRCS) is a confined space with one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere
- Contains a material that has the potential for engulfing an entering employee
- Has an internal configuration such that an employee could be trapped or asphyxiated by inwardly converging walls or by a downward-sloping floor
- Contains any other recognized serious safety or health hazard⁵

Common Hazards

The new rules aim to reduce the risks presented by hazards common to confined spaces in the construction industry, such as oxygen deficiency and the presence of explosive or toxic gases, vapors, or fumes. Examples of confined spaces include condenser pits, manholes, ventilation ducts, tanks, sumps, and containment cavities, among many others.⁶ Hazards can be controlled by locking out moving parts, de-energizing electrical parts or wiring, blocking steam pipes and product in-feeding pipes, draining or pumping out liquid contents, or air monitoring and ventilating.⁷

Similarities and Differences in the Standards

How does 29 CFR 1926.1200 differ from general industry standards? It is generally agreed that this new standard was written to mirror many facets of its general industry counterpart. Construction entities that currently implement and comply with the general industry standard will have a strong basis for compliance to the new standard. That stated, there are several differences from the general industry standards that are discussed below.

The updated confined spaces rules include more specific provisions for requiring coordinated activities when multiple employers are on the same work site. These provisions are intended to ensure that hazards are not introduced into a confined space by an employee working on a different project or task nearby. The general industry standard required communication and coordinated activities, but the nature of a construction site with its larger number



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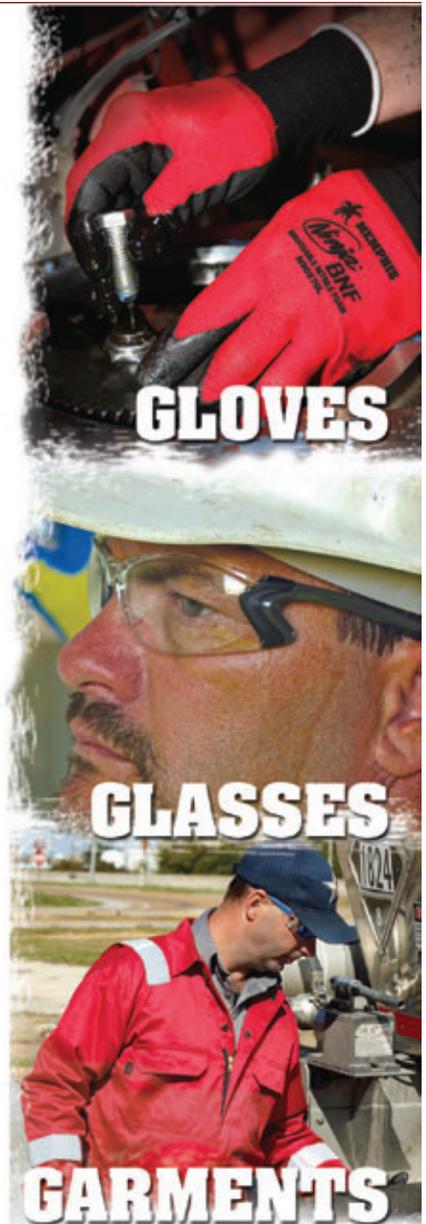
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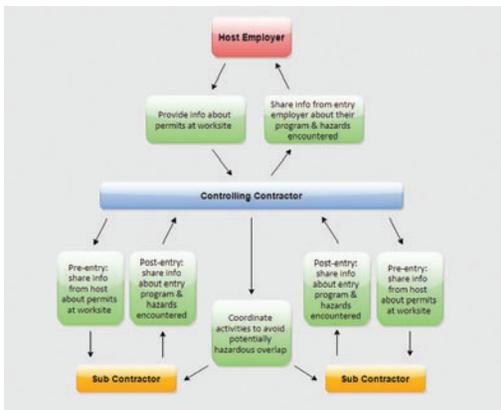
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of contractors makes the dynamic of that coordination somewhat different. (See the flowchart below.)



At a construction site, a host employer (the owner of the site) is added to the mix of parties in communication. Prior to entry operations, the host employer must provide information to the controlling contractor on the location and potential hazards of any known confined spaces, as well as any precautions implemented for employee safety. The controlling contractor must then share that information with each entity entering the space or that could potentially introduce a hazard into the space. Each entry employer (subcontractor) should then inform the controlling contractor of

the permit space program it plans to follow and any hazards likely to be confronted. The controlling contractor is then responsible for coordinating the activities of entry employers when multiple entities are either in the same space or their activities might conflict and introduce a hazard. After entry operations, the controlling contractor must debrief each entity that entered the permit space regarding the program followed and any hazards encountered. The controlling contractor must then provide the information gathered to the host employer.⁸

The new standard also includes a “competent person” clause. The general industry rule required that the employer evaluate the work site and identify confined spaces. The new construction standard instead requires evaluation by a “competent person,” perhaps a supervisor, and potentially multiple persons.⁹

Additionally, the new regulation allows for the mere suspension of a permit rather than a mandated cancellation if a condition not allowed under the entry permit arises with the permit space, so long as the condition is temporary in nature, does not change the configuration of the space, or create any new hazards within it.¹⁰

The Part 1926 standard also encourages continuous atmospheric monitoring where possible. The general industry standard required only periodic monitoring and never attached a timing requirement. It is noted that if the employer can demonstrate that periodic monitoring is sufficient, OSHA does not require continuous monitoring.¹¹ However, continuous monitoring is always best practice.

In the new standard, OSHA requires that employers implement

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an early-warning system that continuously monitors for non-isolated engulfment hazards, such as flash flooding.¹²

Finally, employers are required to provide safety training in a language and vocabulary that workers understand.

Does This Affect You?

The new confined spaces standard applies to anyone doing construction with the exception of excavations, underground construction, caissons, cofferdams, compressed air, and diving, as specified in the law. If a company is engaging in both construction and industrial work and meets the criteria of 29 CFR 1926.1200—Confined Spaces in Construction, the employer should be in compliance.¹³

Employers' Action Steps

Faced with the new OSHA regulation, an employer's action steps should begin with a determination of whether the regulation

is relevant, i.e. whether there is a confined space at a work site. If there are one or more confined spaces that include existing or potential hazards, the employer must classify the space accordingly.

In conclusion, the new OSHA confined spaces in construction standard will have wide-reaching effects on the construction industry and the safety of its workers. Dr. Michaels stated that the rule "emphasizes training, continuous work site evaluation and communication requirements to further protect workers' safety and health."

Organizations planning to take on a construction project need to be well in-

formed about the impacts of the new regulation and how to adjust their processes in order to remain in compliance. This article serves as a summary of the new standard. Further details on the standard in its entirety, compliance assistance documents, and other resources to help employers and workers understand the rule can be found on OSHA's Confined Spaces page: www.osha.gov/confinedspaces/. **OKS**

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Adult Learning Principles for Safety Training

Your employees bring a lifetime of experiences to every training session. Sometimes they'll know more than you do about specific hazards and safety conditions in their current jobs.

BY JEFF DALTO

When you design safety training materials for the workplace, you're designing training materials for adults. Most of us are familiar with learning as a result of our own childhood educations, but adults aren't like children, and they learn differently than children do.

To design safety training that is effective for an adult audience, there are several key concepts to keep in mind. Adult learners¹:

- Are self-directed
- Bring a lifetime of knowledge and experience to training
 - Are goal-oriented
 - Want training to be relevant and task-oriented
 - Learn when they are motivated to learn
 - Like to be and feel respected

So how can you design safety training that uses these principles and gives the learning and safety results you want? Let's look at each in more detail.

Adult Learners Are Self-Directed

Adult learners like to be in control of their training or at least play a role in it. You'll get better results if you include your employees in decisions about the topics you cover, the time of year you cover them, and how training is conducted.

What does this mean in a safety training context? Probably you already do this when it comes to safety—getting your employees' knowledge and opinions and getting them involved in the process. It works the same way with your safety training program. Let employees play a role in deciding what's covered in safety training, when the training is to be completed, and the type of training to use. Also, let them be active participants in the training, even creating training materials and leading sessions when possible.

How to design your safety training accordingly:

- Ask employees to help develop the list of topics for which you'll create safety training. Get their input on job-specific hazards and safety issues.
- Ask for their input during the development or purchase of training materials.
 - Find out which type of safety training materials they prefer, or which blend.
 - Get their input about the best times of the year to complete safety training.
 - Create instructor-led training sessions that em-

phasize discussions, collaborations, and active learning exercises. Avoid lecturing.

- Let employees lead training sessions when possible.
- Create training activities in multiple "equivalent" formats and let employees complete the one they most prefer.

Adult Learners Have Life Experiences

Your employees bring a lifetime of experiences to every safety training session. In some cases, they'll know more than you do about specific hazards and safety conditions in their current jobs. And they also bring experiences from past jobs and their home and personal lives. Training that is well designed seeks out, acknowledges, and anticipates these experiences.

What does this mean in a safety training context? Welcome your employees' perspectives, input, and knowledge about safety. Address their concerns, fears, and beliefs and create safety training materials or sessions that relate to their experiences, anticipate and address those experiences, and actively seek to draw out and include those experiences.

How to design your safety training accordingly:

- Get their input on hazards, potential controls, incidents, and near misses at the workplace.
 - Get their input when training materials are being developed. Ask which topics should be included and which formats are preferred.
 - Incorporate the experience of your employees into your safety training program.
 - During training, ask employees for their own opinions and experiences.
 - Connect the training materials to their past experiences. Better yet, ask them to.
 - When introducing new concepts and ideas, use similes, metaphors, analogies, and comparisons. Relate the new knowledge to things they already know.
 - Be receptive to the opinions of all employees.
 - Be prepared to address people whose opinions are different than the training and may in fact be correct.
 - Be prepared to respectfully address people whose opinions based on past experience are mistaken.
 - Provide ways for employees to offer feedback on their training so you can improve it.

Adult Learners Are Goal-oriented

Adults value training if they think it will help them reach a goal. If you make the goal of training clear, if they value that goal, and if they see how the training will help them reach that goal, you'll get their buy-in.

What does this mean in a safety training context?

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Avoid providing a large amount of training with the expectation that workers will keep it all in mind until sometime in the distant future.

Don't lecture abstractly about safety. Instead, make sure they realize that safety is about things they care about—their hands, their eyes, their ability to earn a paycheck, their ability to support themselves and their families, and their lives.

How to design your safety training accordingly:

- Provide training that leads to a clear, desired safety goal.
- Include learning objectives that clearly state how the training will help them reach a valued safety goal.
- Explain during training how the training will help lead to the desired goal; help your employees see “what’s in it for them.”
- Focus on training in which they “do” something instead of simply getting to “know” something.
- Provide safety training for tasks the workers actually perform (or will perform soon).

Adult Learners Want Relevant and Task-oriented Training

Adult learners want their training to be relevant to their daily lives and to be focused on completing specific tasks. In addition, they want to be able to put what they learned into use shortly after learning it.

What does this mean in a safety training context? Tailor safety training so it's relevant and clearly related to job tasks the employee performs. Avoid training that is too general, comprehensive, or theoretical.

How to design your safety training accordingly:

- Create training programs that focus exclusively on the material the employee needs to know; get rid of additional material.
- Explain how training is directly related to an employee's job task.
- Don't teach employees about safety regulations; teach them to be safe while performing their jobs.
- When possible, avoid “one-size-fits-all” training assignments delivered to everyone.
- Create learning activities that are task-based or that emphasize problem solving.
- Provide training that the learner can immediately transfer to completing a task or solving a problem in his or her work.
- Allow employees to “test out” of safety training if they already know the material (when possible).

Adult Learners Learn When They Are Motivated to Learn

Adults learn when they want to learn and see the value in learning something. If your learners are motivated and engaged, you'll see positive results. If not, the battle's lost before you've begun.

What does this mean in a safety training context? Admittedly, to some degree your options are limited here. OSHA, MSHA, and similar regulatory agencies do make specific requirements about when training has to be completed. But there are things you can do to facilitate this. By consulting with your employees, you can create a training schedule that best fits their needs.

How to design your safety training accordingly:

- Work with your employees to determine the best time of the year to complete annual compliance-based safety training.

- Get their input about the best day and time for the weekly safety meeting.
- Incorporate online training that provides employees more options about when they complete training.
- Provide training in small “chunks” shortly before the time it's needed on the job; avoid providing a large amount of training with the expectation that workers will keep it all in mind until sometime in the distant future.
- Provide training in various different formats to keep the workers engaged.
- Avoid using the same safety training materials year after year.
- Always make sure employees see why training is relevant and necessary.

Adult Learners Like to Be and Feel Respected

Adult learners are adults. They want to be treated with respect and feel respected during training. They don't want to feel insulted or be addressed in a condescending manner. Seems logical enough, no?

What does this mean in a safety training context? Following the guidelines we've mentioned earlier will go a long way toward satisfying this one. Seek out and then incorporate your employees' advice on safety issues in their work areas. Consult with them about safety training. Ask them to participate in training development and design. Have them participate in safety trainings and even lead discussions when possible. Make them feel like a partner in safety and safety training.

How to design your safety training accordingly:

- Always be polite and respectful to employees.
- During training, ensure that a supportive, respectful atmosphere is always maintained.
- Don't assume you know everything and they know nothing; welcome all opinions.
- Create training that's focused on the needs of the learner.

Summary

It's critical to create safety training materials that are employee-centered, but it is very easy to forget this and create training that neglects the needs of your employees.

Two simple things you can do to make your safety training program more employee-centered are to (a) remember that your employees are adults and (b) make sure your training materials make use of the adult learning principles we just covered. If you do this, you'll see positive results in your safety training program and where it matters the most: in safety at your workplace. **OHS**

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The Scary Thing About Safety Training

Safety training can make a substantive impact on employee morale when instructors take this approach.

BY JOSEPH A. SACCARO



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Imagine this scenario: You work at a utility as safety instructor and have been called in to a meeting with your supervisor. As you walk into her office, you note that an executive, someone from line management, is sitting with her, and they both look concerned. You are informed of one of the following two situations:

Situation #1: Several company vehicles have recently been involved in accidents while backing up. So far, the consequences have been limited to property damage; however, the managers believe that, unless some swift and effective initiative is taken, an injury is inevitable. Your assignment is to develop and present some safety training that will prevent any more backing-up accidents from occurring.

Situation #2: A new hazard will be present in the workplace. Perhaps work that has always been performed by two-person crews will now be performed by one-person crews, or crews that have always worked at ground level will be working for a couple of months in an aerial lift in proximity to energized electrical lines. Line management is determined to be proactive. Your assignment is to develop and present

some safety training that will ensure employees have the necessary skills to protect themselves from falling and from electrocution.

When I first worked in safety training, I was given assignments similar to these. The bromide that compares solving a problem to eating an elephant certainly applied to me; I did not know where to begin. I had been thrilled to be promoted into the training department. Now, I was confronted with some tough questions:

- Whom do I train?
- What should the content of the training be?
- Who is qualified to teach the class?
- How do I test to confirm the trainees have mastered the material?

The ensuing decades have included extensive experience with addressing safety issues and also some formal training in both safety theory and instructional design. Over that time, I have learned, both in a production environment and in college classrooms, that I was asking the wrong questions. Questions about selecting trainees and instructors and the content of safety training are appropriate to ask once a safety issue has been rigorously analyzed. However, until that analysis has taken place, these questions are premature. They are based on the often incorrect assumption that training is the best approach to improving safety.

Effective training requires analysis of the safety issue that elicited the training request. This analysis will often reveal that safety training is not the most effective tactic for mitigating occupational hazards. This is an important lesson for supervisors who oversee instructors and training developers. Analyzing safety issues is a discipline, one that training personnel can, with study and practice, master. When one responds to requests for training by analyzing the underlying safety issues, the result will likely be skilled, safe, enthusiastic employees.

Trainees Always Learn Something

Safety training can make a substantive impact on employee morale when instructors take this approach. Imagine how much more attentive trainees would be when they file into a classroom for instructor-led training, or pull up a web-based course on their computer, if they have seen management upgrading equipment, using safer chemicals, and implementing employee recommendations for mitigating safety hazards.

The opposite is true if safety training is not founded on twin pillars of assessing the hazards and considering all options for mitigating the hazards. No matter how talented the instructors are, no matter how high

the quality of the audiovisuals, no matter how tasty the donuts and bagels provided to the trainees, if management has not looked for safer chemicals and equipment and better work practices, the benefits of any training initiative will be cosmetic, not structural. To apply a popular idiom, management will be putting lipstick on a pig. We can avoid having cosmetically enhanced pigs running about in the training department by remembering this scary truth about safety training: *Trainees always learn something.*

- When employees must complete training that does not apply to their job, they learn that management does not view their time as important.

- When generic training does not provide employees with the specific skills and knowledge they need to protect themselves, they learn that management is more concerned with regulatory compliance than protecting employees from injury.

If someone tells a safety instructor, “Let’s run them through the training, it can’t hurt,” then the best answer is: “Really? I believe it can hurt.” The instructor can go on to explain that training can easily undermine morale and instill a mindset that company training sessions are an opportunity to answer text messages. The best response an instructor can make to any request for safety training is to analyze the

request. The first questions to the person requesting the training should be:

- What are the hazards to which employees are being exposed?
- What are the options, in terms of changes to equipment, tools, work rules, PPE, and training, that would protect employees from the hazards?
- Could fatigue or unclear communications be contributing to errors or accidents?
- How will an improvement in safety performance be measured and documented?

OSHA’s excellent guidance on the importance of hazard assessment states: “A first critical step in developing a comprehensive safety and health program is to identify physical and health hazards in the workplace.” A hazard assessment should be the basis of the decision-making that takes place in developing a comprehensive safety program. Performing a hazard assessment and then regularly referring to it is an easy and effective technique for keeping a safety program well matched to the needs of an organization’s employees.

Once a workplace’s hazards have been identified, instructors can begin working on the second step of the analytical process: identifying the best ways to mitigate those hazards. Mitigation initiatives may very well include safety training, however, training, even at its best, relies upon ongoing changes in human behavior, something notoriously

difficult both to elicit in the first place and to maintain over time. Table 1 lists some non-training safety initiatives that are likely to be more effective and less expensive.

Analyzing training requests can significantly improve a company’s effectiveness. Here is a real-life example: In 1990, OSHA published a regulation titled *Occupational exposure to hazardous chemicals in laboratories*. At a utility that was working on complying with the regulation, a team of chemists and a safety instructor were developing a training program that met all of the requirements of the regulation.

More than one hundred of the utility’s employees analyzed water as part of their job responsibilities. Some of the water was analyzed to determine whether it contained the proper residuals of chemicals for use in fossil-fueled and nuclear power plants. Other water samples were analyzed to determine whether they were pure enough to be discharged into lakes and canals. One of chemists on the team read the regulation and came across this exemption to some of the training requirements: “This section shall not apply to: . . . test media such as Dip-and-Read . . . (or) . . . commercially prepared kits” Based on this exemption, the chemist proposed that, rather than annually training all the employees who performed water chemistry, instead the utility should use commercially prepared water testing kits when possible. (Kits were available for most of the water analysis that the employees performed.) Using these kits reduced the number of employees who needed to receive the OSHA-mandated training to fewer than one-third of those who were originally identified. And there were a couple of additional benefits: The accuracy of the water analysis was improved, and employees’ exposure to chemicals was reduced.

Every company could experience similar success stories if training personnel are encouraged to rigorously analyze training requests. **OHS**

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Initiative	Examples
Changing equipment to eliminate a hazard.	Installing strobes and light bars on vehicles that will be parked in traffic zones. Installing rearview cameras on vehicles with poor rear visibility.
Changing workplace chemicals.	Using citrus-based, instead of solvent, degreasers.
Isolating workers from the hazard.	Reducing electric shock hazard by barricading a utility truck being operated in proximity to energized lines.
Improvements to administrative processes.	Making it easier for employees who need ladders to check them out. Or, better yet, conducting a job hazard analysis as part of the job-planning process, then ensuring the proper-length ladders are available at the beginning of the job. Spotters could be required whenever a vehicle is backing up in a congested area.
Addressing motivational concerns.	If workers are experiencing stress because of the possibility of layoffs, planning a communications strategy that will minimize the possibility of destructive rumors, and planning some stress-reducing activities.

Table 1. Non-Training Safety Initiatives

Coordinating Guidelines and the ANSI Z358.1 Standard

While ADA has no specific guidelines for eyewashes or eye/face washes, it does outline other guidelines that can be helpful, such as maximum sink and/or counter height.

BY CASEY HAYES

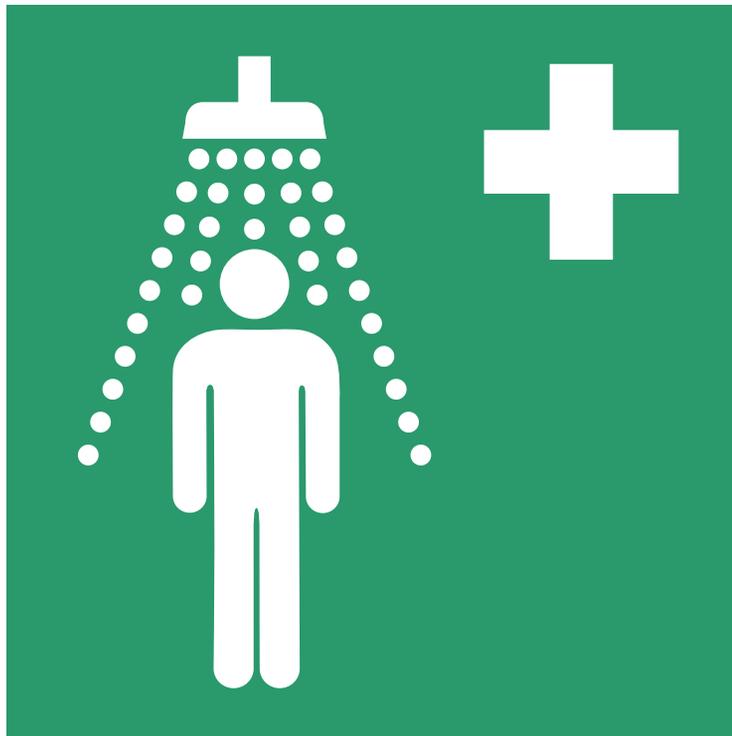


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lation of a variety of different emergency response products. The same application will require further consideration to fully comply with both the ANSI standard and ADA guidelines, which leave ample room for interpretation. But one thing is clear—Section 4.1.3 of the ADA Accessibility Guidelines states, “Where there are individual work stations (e.g., laboratories, service counters, ticket booths), 5%, but not less than one, of each type of work station should be constructed so that an individual with disabilities can maneuver within the work stations.” Consider suitable product designs for laboratory settings to meet this guideline. These include swing-down, sink-mounted eyewashes; wall-mounted, recessed eye/face washes and drench showers; and floor-mounted combination shower and eye/face washes.

Swing-Down, Sink-Mounted Eye and Eye/Face Washes

Available for years, this category of products provides easy access to an eyewash that is mounted at the back or side of a laboratory sink. In its “off” position, the eyewash is rotated up and out of the way of other sink use operations. When needed, the eyewash swings down so the spray, which typically turns on automatically when the head is swung down into position, is directly over the sink and drains into it.

While ADA has no specific guidelines for eyewashes or eye/face washes, it does outline other guidelines that can be helpful, such as maximum sink and/or counter height. ADA requires a maximum sink and/or counter height of 34 inches (86.4 cm) above the floor. Traditional swing-down eyewash or eye/face wash products extend the spray heads up at least 5 inches above the sink when in the down, or active, position, meaning the spray outlets typically measure 39 inches (99.1 cm) above the floor.

The same ADA guidelines mandate that the bubbler outlet of a drinking fountain cannot exceed 36 inches (91.4 cm) above the floor for disabled use. Assuming that a disabled person using either an eye/face wash or a drinking fountain must move to the same degree and will encounter identical limitations, it’s reasonable to determine that traditional swing-down eyewashes or eye/face washes will exceed this maximum range. To comply with ADA guidelines, advancements in product designs lowered the height of the swinging heads so that they sit lower in the sink and below the 36-inch (91.4-cm) maximum.

Proximity to volatile and hazardous chemicals can create dangerous environments. That consideration, together with the necessity of OSHA compliance to ensure safe working conditions, makes appropriate emergency response equipment essential. But the mere presence of this equipment isn’t enough—it also must be instantly accessible and easy to use to be of any value in the event of an accident. And that accessibility and simplicity must extend to all workplace employees, including those who are disabled.

Ensuring that emergency safety equipment complies not only with the ANSI Z358.1 standard, but also with the accessible buildings provisions of the Americans with Disabilities Act (ADA), requires a different approach to site selection and installation. There are no conflicts between the ADA code and the ANSI standard, so complete compliance is easily attainable.

ANSI Z358.1 includes provisions requiring, among other things, clear access and well-lighted emergency response areas that can be reached in no more than 10 seconds of transit time by an injured worker. That requirement affects the number, location, and instal-



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This new configuration is also within the appropriate height range established by ANSI, making it compliant to both ANSI and ADA when the sink is properly installed.

Wall-Mounted, Recessed Eye/Face Washes and Drench Showers

Recessed and wall-mounted safety equipment is very appropriate in laboratory specifications. It's both highly visible and completely out of the way. To satisfy both ANSI Z358.1 compliance and ADA guidelines, installation at a certain height and

location must be taken into consideration.

These products feature a recessed cabinet design that allows for installation in hallways and other confined spaces—locations where disabled access to the area itself might preclude installation. ADA specifies hallway dimensions and the availability of turning space for wheelchair access, and it limits the allowance of “protruding objects.” The design of recessed eye/face washes often allows for more flexible use of available space, which can be at a premium in laboratories. What's more, these products can also materially assist with the

placement of safety response equipment that allows for the ANSI-mandated 10 seconds of transit time.

Another factor is the activation handle for lowering the eye/face wash and activation of the overhead showers. ADA Section 4.27, “Controls and Operating Mechanisms,” outlines criteria for maximum and minimum heights for control location and the force required to operate any device. Per this guideline, operation of activation handles for lowering the eye/face wash tray and activation of the overhead shower should not exceed five pounds of force.

When mounted properly, today's state-of-the-art recessed eye/face washes (both with and without drench showers) can easily comply with both ANSI Z358.1 and ADA guidelines.

Floor-Mounted Combination Shower and Eye/Face Washes

The clear access and turning radius requirements of ADA also will impact equipment placement in those laboratory settings requiring a free-standing combination shower and eye/face wash. Additionally, the same interpreted application of the ADA's guideline for drinking fountain bubbler height can be used to evaluate ADA compatibility of an eyewash or eye/face wash. These measurements should be as follows:

- Eye/face wash sprayer height: 36 inches (91.4 cm) above the floor
- Knee clearance: 27 inches (68.6 cm) above the floor, with the shower actuator pull rod at or below the maximum reach distance when seated of 48 inches (121.9 cm)

Seated use of this equipment, and the resulting increase in access distance, is a factor in depth difference for these products and those that are non-ADA compatible. An ADA-compliant unit will typically measure 37 inches (94 cm) from the wall to the centerline of the showerhead and about 14 inches (35.6 cm) from the wall to the centerline of the eye/face wash bowl. The difference between the measurements allows for seated, simultaneous use of both the shower and the eye/face wash. Compare these dimensions to that of a non-ADA-compatible product measuring 31 inches (78.7 cm) from the wall to the centerline of the showerhead and about 10 inches (25.4 cm) from the wall to the centerline of the eye/face wash bowl. To ensure barrier-free use for disabled employees, more depth is



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necessary. It's an example of using appropriate forethought and planning to ensure that every employee in a laboratory enjoys the same safety considerations.

A wheelchair should not be a factor for a possible treatment delay in the event of an emergency. Ensuring ADA guideline compliance must be as routine as meeting ANSI Z358.1 standards for installation, use, maintenance, and overall operation. **OHS**

Casey Hayes is the Director of Haws Integrated™ Sales and Operations. For more than 100 years, Haws has been committed to inventing, designing, and manufacturing hydration products as well as standardized and customized emergency response products. With more than 8,000 distribution locations and 250 employees worldwide, we continually focus on quality, service, reliability, and complete solution support. Headquartered in Sparks, Nevada, USA, Haws is globally represented, with locations in Switzerland, Singapore, and Brazil. For more information, visit www.hawsco.com.

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What Were You Thinking? The Key to Communicating More Effectively

The occurrence of experientially based at-risk behaviors driven by anticipated gains that outweigh any perceived costs is not limited to the highways or to drivers; it occurs all too often in the workplace.

BY JOSEPH WHITE

Safety authorities, practitioners, and organizational leaders have long struggled to effectively regulate, govern, and influence human behavior in a manner that consistently and uniformly yields desired results. While management systems, standardized operating procedures, and defined safe practices have reduced the frequency of injuries and illnesses in the workplace, they have not fully eliminated these unfortunate events, nor the causal factors involving at-risk behaviors associated with them.

A comprehensive and holistic strategy, designed to bring about the next step change in the practice of safety, cannot be limited to a traditional approach based exclusively on logic, reason, and rational thinking. Most at-risk behaviors occur automatically and intuitively and are the result of experientially based feelings associated with anticipated outcomes. The role of feelings and emotions as a primary source of motivation appears to be of increasing importance. The key to further advancing the effectiveness of safety management practices involves a better understanding of human motivational factors and their subsequent impact on the decision-making process.

The modern safety movement began in the 1970s and has several basic premises. First, organizations must clearly establish and effectively convey expectations regarding behaviors in the workplace. Second, a process must be implemented to observe and monitor actions and behaviors to ensure conformance against standardized work practices. Finally, feedback must be offered to the workforce to reinforce or modify behaviors, based on observations. This technique is deeply rooted in operant conditioning, most commonly associated with B.F. Skinner, a behaviorist, and research he conducted in the first half of the 20th century.

Relative to the outlined management practice, broadly referred to as behavior-based safety, there are several important considerations. To begin with, the number of expectations opposite standardized work practices, whether regulatory or organizationally based, has and will likely continue to increase with

time. However, for many companies that administer the observation process through line supervision, the number of resources and available time to perform this task has diminished during the past 10 to 20 years. Subsequently, the feedback process necessary to modify or condition desired behaviors has been reduced. The effectiveness of this model, when executed as a line function, is further strained when applied to remote, distributed, or self-directed workforces.

As part of the research conducted by Skinner, the schedule of reinforcement is an important consideration in terms of the learning process and behavior modification. As it applies to the workplace and for the reasons outlined above, this presents a genuine and seemingly insurmountable challenge for many organizations. When at-risk behaviors occur without consistent or uniform feedback, the effectiveness of the process is greatly diminished. Furthermore, the immediacy in which this process takes place also is very important. The most effective application of feedback is immediately following the occurrence of the behavior itself. It's for this very reason that long latency health conditions associated with delayed or inconsistent visceral factors, such as those associated with cigarette smoking or poor eating habits, are so problematic.

While Skinner's work has had profound influence and impact on modern safety practices, there is a collective and growing body of research reinforced through recent advancements in neuroscience that shed new light and perspective on human behavior. As previously noted, the role of feelings and emotions as a primary source of motivation appear to be of increasing importance, a revelation that could offer new insight into why we don't always follow the rules and, on occasion, act irrationally. Translated and applied to actions occurring within the workplace, this notion suggests how employees "feel" about any given situation or circumstance may be more representative of subsequent behaviors than what they may actually "think" about it.

The Basis for At-Risk Behaviors

The notion of a two-track mind, one characterized by feelings and the other thoughts, is certainly not new, as references to it were made by philosophers such as Aristotle and Plato more than 2,000 years ago. Its systematic application to the practice of safety, however, is new and could hold the answer to some of our biggest challenges associated with achieving and sustaining world-class safety performance. The basis



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of most defined safety practices is logic-oriented. The basis of most human behavior, however, is not.

Most behaviors are intuitive, occurring automatically, and are the result of our affective response to a given situation or circumstance. As referenced, our affective response is defined as a “gut feeling.” Its significance in judgment and subsequent decision-making cannot be overstated. Daniel Kahneman, a 2003 Nobel Prize winner, referred to the *affect heuristic*, a shortcut to a decision based on an automatic and intuitive response, as “probably the most important development in the study of judgment heuristics in the past few decades.”

To better understand this expanded view of information processing, and in particular how feelings associated with a given set of circumstances could dictate the most likely course of actions to be taken, let’s take a closer look at several important factors. As humans, we live in an environment that is forever changing. We are constantly processing information related to sights, sounds, smells, tastes, and sensory input involving touch. Simultaneously, we are monitoring situations and circumstances for potential risks or rewards, experienced intuitively as feelings and even emotions. By our very nature, we are extremely efficient and effective at managing this enormous amount of information. So much so, we are seldom aware of most of what we are exposed to. So how do we determine what gets processed and remains below the threshold of our awareness and what gets flagged for further attention and processing? It’s a filtration process of sorts, and it’s influenced in large measure by past experience.

The role of experience is a key to understanding why many at-risk behaviors occur and to better understanding ultimately what can be done about it. Consider for a moment a typical behavior one might expect of a driver on a highway with unobstructed traffic flow. Many will set cruise-control speeds slightly above posted speed limits. The balance between traveling at a faster rate of speed for an anticipated benefit and the possible cost of going too fast and getting a ticket is influenced heavily by past experience. This process occurs intuitively and automatically and doesn’t involve analytical risk assessments supported by data. Each time the benefit is realized

without a negative consequence, be it an accident or ticket, the behavior becomes more habitual and more automatic. The occurrence of experientially based at-risk behaviors driven by anticipated gains that outweigh any perceived costs is not limited to the highways or to drivers; it occurs all too often in the workplace for the same reasons outlined above.

Regarding the basis for at-risk behaviors in the workplace, it’s important to consider several factors. First, T. Dell and J. Berkhout conducted a study in which they found that injuries were 88 percent more likely to occur in a perceived “safe” job, as compared to the workforce’s interpretation of the site’s most dangerous job. This data is supported broadly by a number of organizations; perceived low-risk tasks typically involve the highest frequency of injury. As noted above, the reason for this phenomenon is strongly linked to the role of experience.

Second, when people make repeated choices, including those involving at-risk behaviors, and experience firsthand subsequent outcomes aligned with anticipated outcomes, they tend to underestimate the actual risks involved with their actions. This can and does lead to “drift.” Employees realize anticipated benefits associated with shortcuts and chances taken, reinforced through experience over time, which leads to habituated behaviors.

Finally, when there is a conflict between intuition and our rational system, our intuitive response, which is experientially based, appears to have the strongest influence on decisions made and subsequent actions taken. This explains in part why words and data may have very little influence on someone’s behavior. Labeling a behavior as “unsafe,” when it may have been performed hundreds or even thousands of times before without negative consequence, is more than a challenge. Furthermore, if the behavior was associated with a forecasted benefit that was realized, you are now at odds with actual experience, a hurdle that logic and reason alone will have limited abilities to overcome. (The only source of knowledge is experience, said Albert Einstein.)

How to Influence Behaviors

While experience may be the driving factor behind most at-risk behaviors, it also is the

key to overcoming them. For most people, the portal of entry for influencing automatic and intuitive behaviors is through the heart and not the head. To reach the heart, you must speak its language, which requires an emotional appeal. While logic and reason are influenced by words, data, and analytical comparisons, our intuitive system is not. To effectively influence behaviors, you must employ images, emotions, personal stories, and experiential techniques that connect with your workforce and subsequently move those workers.

An industry that has embraced experiential techniques as a means of improving on-the-job safety performance is commercial aviation. In spite of numerous efforts to improve pilot performance, crashes due to pilot error remained at 65 percent for more than 50 years. That all changed in 1990 when the industry implemented the use of flight simulators, a tool designed to provide experiential learning in a safe and controlled setting. Since that time, crashes due to pilot error have declined by more than 54 percent. Since 2001, only one fatal jetliner crash in the United States has been attributed to pilot error. While even one fatal crash represents a tragedy, it is by any measure a remarkable level of performance, considering there are more than 30,000 flights daily in the United States. The field stands alone with six sigma operational performance, demonstrating fewer than 3.4 defects per 1 million opportunities.

The next frontier for the practice of safety, and an area of emerging interest and exploration for DuPont Sustainable Solutions (DSS), involves the practical application of affective-based research to address some of the world’s biggest challenges related to health, safety, and overall well-being. Within this research is a wealth of information regarding the means to more effectively communicate using techniques that inspire and influence, and not just inform.

Opportunities to further advance the practice of safety and any subsequent improvements in performance will be the result of leaders who rely on influence, and not just edict, as a means to reduce the occurrence of at-risk behaviors. **OHS**

Joseph White is an employee safety solution architect with DuPont Sustainable Solutions (DSS). He has 25 years of operational safety experience.



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Climate and Culture Before, Not After, Behavior-Based Safety

For BBS to work, the organization must have a culture ready for the tool to take them to the next level.

S And that safety culture is not the next step after Behavior-Based Safety (BBS) efforts; it's a determining factor on whether to implement or not implement a behavioral approach. Because culture is the most effective reinforcement tool, it will be one of the most important considerations when attempting to implement either compliance or advanced behavioral efforts.

One client recently shared, "We unknowingly decided to provide the workforce of a site we recently acquired new steel-toed boots, as we knew they wouldn't have the resources or channels to procure them. It was, after all, a company-wide safety policy, and we knew many employees didn't currently wear shoes in the community from which they came. We found out shortly afterwards that most employees promptly sold them to friends and family for extra money."

If it is not common to wear protective shoes to work, like with in some cultures, mandating new foot protection will be met with minimal compliance. While it's an extreme example, your culture is often why improvement efforts, compliance or advanced, succeed or fail.

Recently, there has been a push by some within the BBS community to attempt to differentiate by promoting the next evolutionary step to BBS as a focus on safety culture or to create a culture where there is observable and heart-felt caring. This is concerning and might provide insight into why the typical pre-packaged or pre-defined BBS methodologies never yield the expected return. When it comes to change, especially with culture, one size never fits all.

Evolving a culture is like growing a plant. You can't manage culture, nor can you manage the growth of a seed. It is the climate and chemistry that must be managed to obtain the desired outcome. Culture is what is common within an organization, group, or society. Further, it is an outcome, a byproduct. You can't manage a result. If the culture is not already made up of leaders and at least some workers committed to safety excellence, BBS won't work. If the culture does not have a caring atmosphere, BBS won't work. If cooperation doesn't already exist within the culture, BBS won't work. If coaching is not common and viewed as a desirable, expected, and reinforced interaction and communication style, BBS won't work. If the safety climate or chemistry is not ripe for a new seed of change (i.e., BBS) to be grown, always start with the climate and chemistry.

Knowing what it takes to achieve excellence in safety culture, BBS was never designed to be a direct culture-changing tool. Certainly, it had some positive carryover effect. However, it was designed to address and improve behaviors that could help prevent injuries and incidents. Once this gains traction and it (e.g.,

observations, feedback, peer-to-peer safety communication, and leveraging proactive safety measurements to improve safety) becomes common, it becomes cultural, which is a byproduct of the efforts.

To say the next step after BBS is to directly address the safety culture or create an environment where caring is more common is akin to a car manufacturer deciding to enter the flight or float industries to capture additional market share with its existing knowledge, technologies, manufacturing, and assembly plants. Eventually there might be a way to make this work, but there are also much better, more effective, and efficient tools to accomplish the same result. Moreover, entering into a market to serve customers with what you think they will want or need without knowing what they value and what they would accept or reject is fraught with opportunities for disaster.



Knowing what it takes to achieve excellence in safety culture, BBS was never designed to be a direct culture-changing tool.



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For BBS to work, the organization must be ready for the approach, both in traditional aspects of their safety management-systems and compliance efforts, but also by having a culture ready for the tool to take them to the next level. Implementing any significant improvement approach prior to understanding and addressing the cultural considerations is, quite simply, horrible, unwise, and unethical advice. What people will support and not support must always be a considered factor. **OHS**

Shawn M. Galloway is the co-author of STEPS to Safety Culture Excellence and president of ProAct Safety. He has helped hundreds of organizations within every major industry internationally achieve and sustain excellence in performance and culture. He is also the host of the acclaimed weekly podcast series Safety Culture Excellence®. He can be reached at 800-395-1347 or info@ProActSafety.com.

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Curing Cultural Cancer?

Is it possible to cure a severe cultural illness? Perhaps, by applying some principles from cutting-edge oncological research. Recent studies have shown it possible to not only send advanced-stage cancers into remission, but to actually cure these likely fatal illnesses.

This revolutionary work, successfully performed at such premier institutions as the Mayo Clinic and others, enlists medical jujitsu. It harnesses modified “killer” and other pathogenic (disease-causing) viruses to, in turn, selectively target and then often eliminate cancerous tumors. These pilot tests have shown dramatic results working through modified smallpox, common cold, polio, rabies, and even AIDS viruses. In one study, 90 percent of no-hope, tried-everything-else patients scanned clear of cancer cells anywhere in their bodies after such targeted viral therapy.

Traditional Western medical treatment for cancer seems to default toward surgery, radiation, and chemotherapy (or a combination). The downside is there are parts of the body (e.g., the brain) where it’s not possible to do any of these or else risk doing untold harm to the patient. (As in, “The surgery was successful but the patient died.”) In addition to other potentially serious side effects, these two longstanding treatment modalities may not even work with certain cancers and often don’t result in a cure, just buying a little time.

Cultural cancer can be similar. Think of cancer cells as aberrations that may be triggered by a variety of contributors. Sometimes a company can develop “tumors” of individuals or groups that have turned unhealthy, people who actively attack their own employer. According to a recent Gallup poll on engagement, Jim Harter, Chief Scientist, Workplace Management and Well-being, wrote, “...18% (of the workforce) are actively disengaged, and these are people that are working against the organization’s objectives.” That’s about one in five who, like cancer cells, are effectively sabotaging a company’s well-being! Of course, these are not evenly distributed among all organizations. Some companies have much greater or more advanced cultural illnesses than others—and this is no coincidence; there are always some leadership and other reasons why. If leaders suspect they have rampant negativity in their company, it’s time for them to first look at their own actions, rather than point the finger of blame outward. After all, other companies seem to do well with younger-generation workers, aging ones, and in highly competitive or downsized environments. Bemoaning and blaming cancers doesn’t help the patient/company get well; this merely gives the illness more time to take firmer hold or spread.

Like the real illness, cultural cancers also can metastasize, with discontent spreading through the company’s “lymph system” (e.g., rumor mill and other informal communications). Experience shows that those who are relatively bitter, cynical, or disaffected may spend a disproportionate amount of time trying to infect/win others over to their point of view.

As in medicine, a common organizational first response to cultural cancers is “surgery,” effectively removing/firing/moving away disaffected workers. But this assumes the negativity hasn’t already spread and that the company can discard potentially well-trained and needed resources. Of course, leaders have to be willing and able to identify and let go of those who are not aboard the direction

to which they want the cultural train to roll. This, in fact, applies as well to otherwise productive managers who are safety-averse yet allowed to remain in place even when they’re actually torpedoing the Safety mission. Shortsighted executive leadership can be too quick to discard workers and too slow to detach disaffected managers who affect/infect many others.

Other common treatment approaches are akin to chemotherapy or radiation, creating more restrictive rules and procedures that may ravage negative and healthy company members alike. Even with courses of these expensive and often-disabling protocols, the illness can soon return if its sources aren’t found. Alternately, consider applying the principles of the latest and most promising cancer treatment described above:

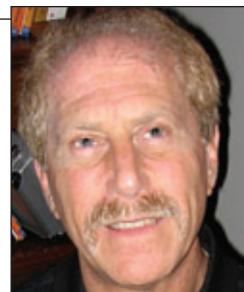
- *Identify significant sources of discontent.* Often these are outspoken workers who make no bones about their anger toward and distrust for management.

- *Leaders take control of themselves first.* They have to discipline themselves to *not* kneejerk attack disaffected workers. First, these employees may have valid feedback to offer about the state of the company’s mixed messages, procedures, and worker relations. But best leaders don’t reflexively shoot the messenger. Rather, they realize that all feedback reflects at least a portion of the company’s reality and those who are verbally upset may bring value to the company apart from their discord. Second, strong leaders remember that other workers are watching how these negative people are treated (who may actually be courageous enough—or past caring about the consequences—to voice what many others may be thinking).

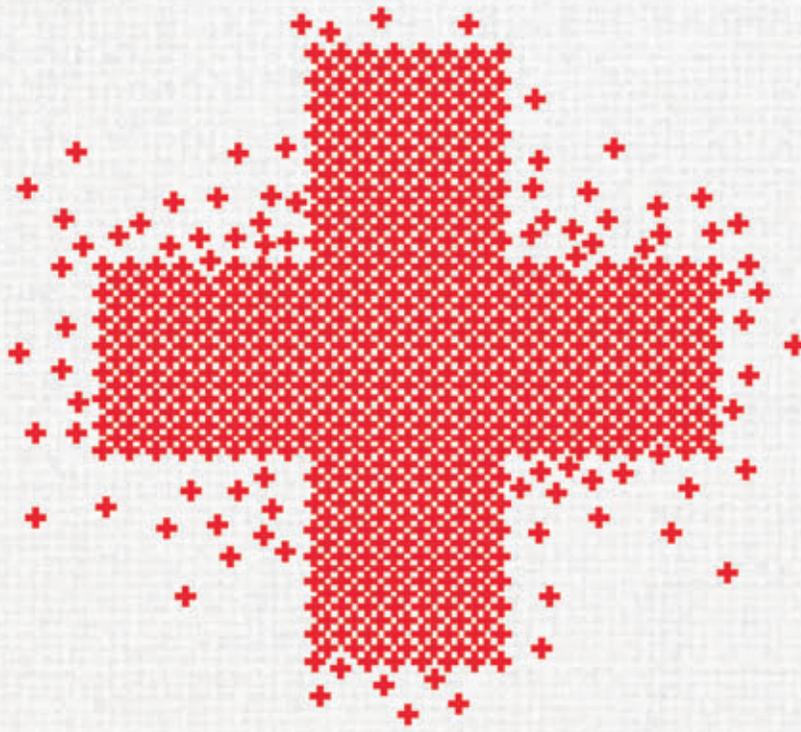
- *Look to terminate their negativity, rather than just terminating them.* Avoid what typically *doesn’t* work: 1. Trying to reason/talk them out of their anger, 2. Attempting to disrespect, shame, or punish them until they turn around, 3. Isolating them (communication will likely still spread). These approaches are almost guaranteed to worsen the situation.

- *Turn and enlist viral agents into positive agents of organizational well-being.* More than three decades of worldwide experience has consistently shown that the most effective strategy here is to find ways to place cultural negatives into a position to make a positive difference. A multitude of organizations have realized dramatic successes in Safety by: Selecting and then effectively training some of their most disaffected workers to become peer Safety catalysts. It’s amazing how, by deputizing previously “ill” workers, these can turn around to strengthen first their own, and simultaneously, grassroots safety performance and actions of those around them. Another advantage: This approach turns around pre-existing “problem people” from being anti- to pro-company well-being.

Be aware that all of the above—medically or culturally—has to be well conceived and executed. With the right approach and skill set, leaders can indeed turn the most virulent cultural pathogens into aligned forces for health and safety. **OHS**



Robert Pater (rpater@MasteringSafety.com) is Managing Director, Strategic Safety Associates and MoveSMART®, www.MasteringSafety.com.



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