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CIRCLE 44 ON CARD

Battling Distractions, Peer Pressure and Complacency

It is important to take a moment to humanize the workforce when thinking about occupational safety.

In America, there are 382.2 million people, of which 164.4 million are employees in a field of labor at an increased risk of injury or fatality due to the nature of their work. These employees are humans with lives, spouses and children. They have anxieties, worries and dreams. They deal with co-workers and quotas.

It is important, when thinking about occupational safety, to take a moment to humanize the workforce as these workers deal with inherently human issues such as distractions, peer pressure and complacency daily.

In a recent conversation with a safety professional, he told me that during the over 100 interviews he had conducted after an injury on a worksite, the injured worker almost always said the same two things. First, "I know I shouldn't have done that." And second, "But we always do it like that."

What does this tell us about the mindset employees are in when they come to work? It tells us they understand the risks and hazards associated with their jobs. They know that the corners they are cutting could lead to injury—or worse, a fatality on the job—but that there are external factors keeping them from completing tasks safely.

These external factors can be distractions from life outside of work, or peer pressure from co-workers to quickly finish tasks. This is something that often happens in the workplace—a procedure is seen to be too monotonous and shortcuts are created to speed up the process.

Workers believe this new, somewhat speedier process is the way to work "smarter" and not "harder." Any worker that comes in trying to complete the task in the "safe" way, might then be peer pressured by those around them to complete the task using the shortcut so they can finish early, or meet their quotas.

What these employees may not realize, however, is that the longer, more monotonous process was created to safeguard them from hazards that could put them in harm's way. OSH professionals are looking out for the safety and health of employees first and foremost. This can often collide with the C-Suite's idea of how fast employees should be moving, or how much should be getting done in a particular time frame.

It is important to factor in safety when judging or timing for productivity or performance. Make sure safety has a seat at the table to help manage expectations of higher outputs. Remember, injuries and fatalities cost more time and money than having employees work safely in the first place. OH&S

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ID STATEMENT
Occupational Health & Safety (ISSN 0362-4064) is published 9 times a year, Jan/Feb, Mar, Apr, May, Jun, Jul/Aug, Sept, Oct and Nov/Dec by 1105 Media, Inc., 6300 Canoga Avenue, Suite 1150, Woodland Hills, CA 91367. Periodicals postage paid at Woodland Hills, CA 91367, 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 847-513-6011 or 888-768-8759 for U.S. & Canada; 00-1-847-513-6011 for International, fax 847-763-9564. **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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Corporate Headquarters:
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6300 Canoga Avenue, Suite 1150,
Woodland Hills, CA 91367
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VOLUME 90 NUMBER 6

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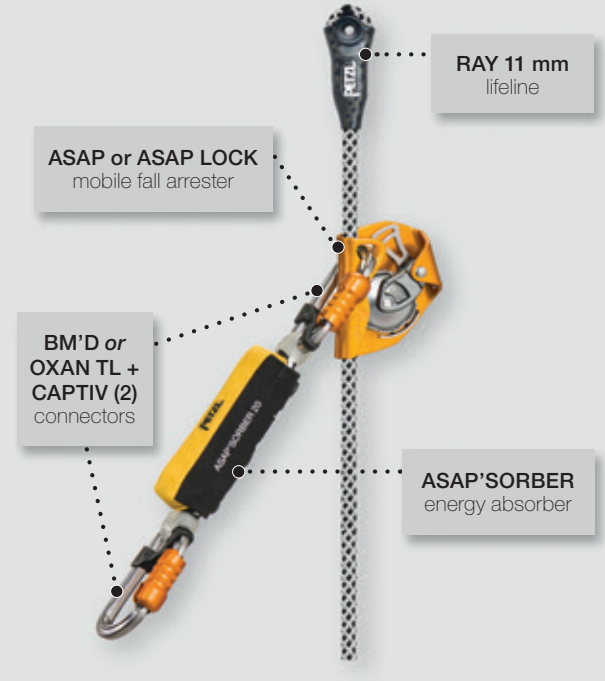

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CIRCLE 27 ON CARD

Proper Use of Fall Protection PPE in a Confined Space

Planning, preparation and proper equipment is key to protecting confined space workers from fall hazards.

BY ANNE OSBOURN

MSA — The Safety Company/MSAsafety.com

Confined space work can be dangerous. The truth of this statement cannot be understated. Confined space workers face a plethora of risks, ranging from asphyxiation and engulfment to electric shock, explosion and falls.

Because the onus to protect confined space workers is on the employer, it's imperative for employers to recognize and plan appropriately for confined space work. This article is intended to assist employers in understanding that obligation as it relates to fall protection.

For full compliance with the OSHA 29 CFR 1910.146 standard[1] that governs confined spaces, employers are urged to rely upon the expertise of safety and health professionals, such as industrial hygienists.

This article is intended to help employers like you who want to effectively protect confined space workers from falls by helping you understand more about confined spaces, including what they are, why they're a fall hazard and what essential PPE is needed.

What is a Confined Space?

The core definition of a confined space is any area that's not easily accessible by people, is not intended for long-term occupancy, is characterized by limited entry and exit points and has the potential for the presence of significant hazards.

OSHA's definition of confined space is particular to what they call "permit-required confined space." As defined by OSHA[2], permit-required confined space is any area that:

- Contains or has the potential to contain a hazardous atmosphere
- Includes material that have the potential to engulf anyone who enters
- Features walls that converge inward or floors that slope downward, tapering to a smaller space that can trap or asphyxiate an entrant
- Comprises any other recognized safety or health hazard, such as unguarded machinery, exposed live wires or heat stress

Confined spaces are found in varying sizes and shapes within a wide variety of industries. Because not all confined spaces are as easily identifiable as a confined space, as an employer, you should leverage the expertise of highly trained workers to identify their confined spaces and assess the potential hazards. This will allow you to determine which controls are appropriate for your specific confined space hazards.

How Confined Spaces Present a Fall Hazard

There are a wide range of potentially dangerous situations for confined space workers, including: lack of oxygen, chemical reactions, accidental leaks and spills and exposure to toxic gases.

One of the least understood hazards, however, are slips, trips and falls. Fall hazards in confined spaces can result at any point from entry to exit, and, of course, while the worker is doing

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> *Because the onus to protect confined space workers is on the employer, it's imperative for employers to recognize and plan appropriately for confined space work.*

his/her work in the confined space. Typical fall hazards include physical equipment that is an obstacle to a worker, slippery surfaces, poor visibility, inadequate lighting, unsure footing and changes in the confined space environment as a result of such things as leaks, spills and vapors.

Preparing for Confined Space Entry

Before any worker enters a permit-required confined space, both you, as the employer, and your employees, should know and follow a well-defined system of confined space procedures and precautions. Be aware that if there is any deviation from the standards set on the permit, the confined space should be immediately evacuated.

To further ensure worker safety, it's imperative to equip and train workers on the correct tools and proper use of their PPE before confined space entry. All fall protection and other PPE should be checked before use and confirmed to be in good working order. Any equipment that shows signs of wear, damage or doesn't pass inspection should not be used.

Under no circumstances should an employee enter a confined space without the correct training and equipment – this includes rescue workers. More than 60 percent of all confined space fatalities occur because attendants or unauthorized personnel rush into hazardous environments without the proper PPE.[3]

Must-Have Fall Protection

Fall protection PPE is used in confined space work for entry, exit and retrieval/rescue. As such, confined space equipment should consist of a complete system. Here are some common components of a confined space fall protection system:

Entry and retrieval. A tripod/davit system with attachment points is an easy-to-use device that's simple to set up and gives workers a stable base of support.

Connecting devices. A self-retracting lifeline with emergency retrieval capability provides both a rescue option, as well as fall arrest protection. A hoist, or winch, provides an option for raising and lowering materials and personnel. Both devices should be used on your tripod or davit arm system.

Full-body safety harness. Every entrant should wear a full-body safety harness with an attached lifeline. This provides fall arrest protection and enables safe and quick extraction, even in horizontal applications, if necessary. Harnesses may be equipped with shoulder, back, or chest D-rings for both entry and rescue scenarios. Harness types can vary, depending on the job and rescue plan, as well.

Confined Space Fall Protection Checklist

All confined space activity should be conducted in accordance with OSHA standards. The following questions, however, may be useful in evaluating your fall protection PPE for confined spaces:

- Is the equipment stored in a clean, dry, cool space?
- Has all fall protection equipment been inspected by a competent person in the required time frame (six months or a year pending local regulation?
- Have all workers received correct and adequate fall protection and rescue training?
- Have all personnel been properly fitted for a full-body harness?
- Does each harness have the appropriate attachment points for fall arrest, personnel-riding and rescue?
- Is a tripod or davit appropriate for the specific confined space?
- Is portability of davits important?
- Is there enough clearance for the tripod to fit over the entrance without risk of one of the feet coming too close to the confined space opening?
- Is there enough space around the confined space opening to ensure that top-side attendants are safe from falling into the opening?
- Does the confined space have a ladder in place or is a hoist/winch needed?
- What is the maximum line length needed within the confined space to complete the task?
- Is proper equipment available for entry rescue and is it included in the rescue plan?
- Does the equipment allow for non-entry rescue and is all equipment matched to the rescue plan?
- Is there a method for tracking and monitoring the condition of all equipment?

Conclusion

The potential hazards of confined space work should never be underestimated. You, as an employer, must maintain your readiness with a combination of a precise, well-practiced plan, the proper PPE for the environment, and all-worker training on equipment and OSHA-compliant procedures. **OHS**

Anne Osbourn *is the Marketing Manager for the Construction Segment in North America at Mine Safety Appliance. With over 8 years of marketing and product development experience, Anne joined MSA in 2015 and has worked as a product line manager in both Respiratory, and Fall Protection roles for the industrial market.*

REFERENCES

1. *https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.146*
2. *https://www.osha.gov/confined-spaces*
3. *https://www.cdc.gov/niosh/docs/86-110/default.html*

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CIRCLE 49 ON CARD

Industrial Vacuum Cleaner Options for Cleaning Confined Spaces

Heavy duty industrial vacuum cleaners can eliminate the need to enter confined spaces for cleaning, reducing hazards and costs in a variety of ways.

BY DOAN PENDLETON

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Whether it's eliminating the need to enter a permit-only confined space to clean accumulations of combustible dusts from grain elevators, or eliminating the amplified ergonomic, fall and overexertion hazards associated with cleaning non-permit confined spaces, such as blast recovery and sludge pits, industrial vacuum cleaners are an accepted engineering control to mitigate safety hazards and support compliance with OSHA and NFPA guidelines.

Employing industrial vacuum systems in housekeeping routines to remove dust and debris not only creates a safer environment but also saves companies tens of thousands of dollars per year in labor costs, equipment maintenance, material expenditures (through reclamation), and through increased uptime by reducing lengthy production interruptions for manual cleaning.

In environments where cleaning needs to occur in confined spaces, especially in permit-required spaces, the ROI of an industrial vacuum cleaning system quickly rises when vacuums allow for cleaning from outside the enclosed space or cut man hours in half.

OSHA defines a confined space as one that is large enough for an employee to enter fully and perform assigned work, is not designed for continuous occupancy and has a limited or restricted means of entry or exit.

A confined space becomes a permit-required confined space when inherent, introduced or potential serious hazards to health or life are present, such as hazardous atmospheres, materials that can engulf workers with spaces that can trap someone and other recognized serious hazards.

Permit-required confined space procedures are costly in terms of evaluation, training, PPE and the additional manpower needed to not only monitor entry, but to remain at the ready for the duration of a task, turning a one-person assignment into a four-person assignment.

Although necessary for safety and health, coordinating time-consuming entry into permit-required spaces for cleaning is sometimes regarded as a nuisance which can result in less frequent housekeeping and maintenance activities in those spaces.

Some equipment that qualifies as confined spaces and are common in most industries, include tanks, silos, reaction vessels, vats, boilers, pits and mechanical conveyor enclosures. Combustible dusts and respiratory irritants are common hazardous substances that industrial vacuum cleaners mitigate in permit-required spaces.

In many plant environments, portable heavy duty industrial vacuum cleaners that are built to meet the rigorous demands of 24/7 industrial operations, facilitate cleaning from outside of confined spaces, as recommended in NFPA 350 Guide for Safe Confined Space Entry and Work 8.4.1.1, eliminating the need for entry.

OSHA does not regulate non-permit confined spaces, but cost and safety-oriented plant and safety managers understand the exacerbated safety hazards that exist when manually cleaning such spaces and look for solutions, such as industrial vacuums, to mitigate them.

Just as no two confined space areas have identical conditions, no two vacuum cleaning applications are the same. Many factors influence vacuum cleaning system design including the characteristics of the material cleaned (such as: abrasiveness, corrosiveness, flammability explosion hazard), volume collected, bulk density, particle size, filtration goals, maximum temperature, total number of pick-up points, the number of simultaneous operators, hose size, longest vertical and horizontal tubing runs from vacuum, available floor space and collection container considerations.

Most industrial vacuum cleaner systems require standard equipment with option capabilities to best fit a facilities application.

The range of industrial vacuums available for specific applications and debris, coupled with tools and accessories tailored to application needs, have advanced the equipment beyond general

housekeeping and safety uses and into production tools that increase uptime and improve product quality. Below are some of the basic vacuum cleaning systems that can make cleaning confined spaces more economical for facilities and safer for workers.

Combustible Dust Vacuum Cleaners

Every plant has unique processes and thresholds when it comes to combustible dust. There is no one size fits all vacuum cleaning applications and no single standard or one industrial vacuum cleaner that can meet the requirements for all combustible dusts.

Companies really need someone who has intimate knowledge of how chemicals react in certain environments and has experience in NFPA standards to help them choose the right combustible dust vacuum cleaner.

Combustible dust vacuums are completely grounded and bonded to meet the NFPA 70 requirements for grounding and bonding. These vacuums also meet the definition of an "intrinsically-safe system".

Although some combustible dust vacuums are available with electric motors, compressed-air-powered vacuums that do not use electricity and do not generate any heat from operation are the first defense to explosion prevention. These vacuums can also be powered by inert gas such as nitrogen or argon in lieu of compressed air for an additional factor of safety.

Portable Compressed-Air-Operated Vacuum Cleaners

Compressed-air-operated vacuum cleaners are the workhorses of industrial vacuum cleaning systems, cleaning up everything that will fit in the material hose from abrasives, fine powders, litter and metalworking chips/fluids and sands and flammable liquids. These vacuums are also ideal for use with abrasive cement particles that can damage electrical equipment over time.

Compressed-air-powered vacuum cleaners operate on the Venturi principle and by design create their own vacuum without motors or moving parts, making them intrinsically safe. No moving parts or motors also means that units generate no heat and last longer because there are no parts to fail. They are the most economical and energy efficient industrial vacuums.

Variable orifice venturi allows operation with the lowest air consumption possible yet enables users to double the vacuum level with more compressed air for more difficult cleaning tasks such as high-density materials, viscous liquids or longer vacuum distances.

Some models of portable compressed-air-operated vacuums are also available in packages specifically designed and ATEX certified for combustible dust and flammable liquid applications.

Combustible dust vacuums are available with unique pulse jet filter cleaning systems that, with the push of a button, backwashes accumulated dust from the filter, eliminating the need to manually clean the unit and virtually eliminate filter blinding.

Continuous Duty Vacuum Cleaners

Continuous duty vacuum cleaners are designed to withstand 24/7 operation and to handle some of the toughest materials including heavy steel shot or mounds of fine powders. Powerful enough to pick up a bowling ball, portable continuous duty vacuums are available with motors ranging from five hp to 30 hp with add-on intercept vessels to expand collection capacity and improve material handling.

> *Employing industrial vacuum systems in housekeeping routines remove dust and debris to create a safer environment.*

Continuous duty vacuums have been used by metal finishers to eliminate workers descending into a three-foot-deep trench confined space with awkward footing to manually shovel and scoop heavy blast media, cutting clean up time by more than 50 percent and eradicating several ergonomic hazards.

Break Away Vacuum Cleaning Systems

Dual purpose break-away vacuum cleaning systems are powerful, portable units that operate much like a central vacuum cleaning system that is able to break away from tubing networks and used independently elsewhere in the facility to clean up spills.

These break away central vacuum systems use powerful portable vacuum units in concert with several small tubing networks. For instance, if a user is working in a 100 by 200 square-foot area and there are two more areas in another building, individual tubing networks are created in each space and the portable unit moved from one tubing network to the next. These systems provide the convenience of a multi-inlet central vacuum cleaning system, with the energy efficiency and flexibility of a portable vacuum.

Powerful suction is what enables facilities to add extension wands that allow operators to clean permit-required confined space from the outside without sacrificing power. Higher suction is created with a positive displacement pump (PD pump) vacuum producer. PD pumps are capable of generating high vacuum and excellent airflow, so they have the ability to pull massive amounts of material over distances and pick up heavy materials not typically associated with an industrial vacuum cleaner.

Portable industrial vacuum cleaners have the potential to eliminate entry into permit-required confined spaces for cleaning, decreasing labor, administrative costs and losses related to illness or injury caused by serious hazards and ergonomic, slip and fall, overexertion, inhalation and explosion hazards that are increased in small spaces.

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CIRCLE 43 ON CARD

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Understanding the Differences Between Construction and General Industry Confined Space Regulations

Understanding the standards is the first step in safely working in confined spaces.

BY JOSEPH HARKELROAD, MEGAN SCHERER

Rarely are construction and general industry OSHA standards identical or interchangeable. When it comes to OSHA's confined space standards, there are some notable differences between the Construction 29 CFR 1926, Subpart AA standard and General Industry 29 CFR 1910.146.

Before we dive into the confined space details, let's first define some terms. OSHA says that "general industry" is any industry not included in construction, agriculture, or maritime.

OSHA clarifies other nuances in several letters of interpretation:

- The first is from February 1, 1996. OSHA makes it clear that Section 29 CFR 1910.12(b) defines construction work as "construction, alteration, and/or repair including painting, and decorating." Further, construction work is defined as work not limited to new construction, which includes the repair of existing facilities, and the replacement of structures and their components."
- OSHA also clarified the difference between construction and maintenance in 1999, by saying maintenance is "keeping equipment or a structure in proper condition through routine, scheduled or anticipated measures without having to significantly alter the structure or equipment in the process. For equipment, this generally means keeping the equipment working properly by taking steps to prevent its failure or degradation."
- OSHA clarified maintenance vs. construction activities on November 18, 2003, by explaining, "Construction work is not limited to new construction but can include the repair of existing facilities or the replacement of structures and their components. For example, the replacement of one utility pole with a new, identical pole would be maintenance; however, if it were replaced with an improved pole or equipment, it would be considered construction."

You might ask yourself, why does it matter if we are doing maintenance or construction? The answer is that maintenance tasks are covered under the general industry regulation. For years, there was only a general industry standard, 1910.146 (a). Because construction was specifically excluded from following the general industry confined space standard, OSHA would have to cite concerns in the construction industry under several different areas:

1. The general duty clause
2. 29 CFR 1926.21 (b)(6) (which no longer exists)
3. 29 CFR 1926.154 (a)(2) "When heaters are used in confined spaces..." (exists with vague lanuage)

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15	37	59	81	103	125	147	169	191	213	235	257	279	301	323	345	367	389	411	433	455	477	499	521
16	38	60	82	104	126	148	170	192	214	236	258	280	302	324	346	368	390	412	434	456	478	500	522
17	39	61	83	105	127	149	171	193	215	237	259	281	303	325	347	369	391	413	435	457	479	501	523
18	40	62	84	106	128	150	172	194	216	238	260	282	304	326	348	370	392	414	436	458	480	502	524
19	41	63	85	107	129	151	173	195	217	239	261	283	305	327	349	371	393	415	437	459	481	503	525
20	42	64	86	108	130	152	174	196	218	240	262	284	306	328	350	372	394	416	438	460	482	504	526
21	43	65	87	109	131	153	175	197	219	241	263	285	307	329	351	373	395	417	439	461	483	505	527
22	44	66	88	110	132	154	176	198	220	242	264	286	308	330	352	374	396	418	440	462	484	506	528

BUYING PLANS SURVEY

1. Which of the following product(s)/services do you plan to purchase in the next 12 months? (Select all that apply)

836 ❑ AED's
800 ❑ Confined Space
801 ❑ Consulting Services
844 ❑ Continuing Education
802 ❑ Drug & Alcohol Testing
803 ❑ Emergency Response
804 ❑ Ergonomics
805 ❑ Eye & Face Protection
806 ❑ Fall Protection
807 ❑ Fire Safety
808 ❑ First Aid
809 ❑ Foot Protection
847 ❑ FR Fabrics
839 ❑ Gas Detectors/Monitors
810 ❑ Hand Protection
811 ❑ Hazmat Handling
812 ❑ Head Protection
813 ❑ Hearing Protection
814 ❑ Heat Stress
845 ❑ Industrial Hygiene
815 ❑ Instrumentation/ Monitoring Equipment
841 ❑ Laboratory Services
816 ❑ Lockout/Tagout
837 ❑ Material Handling
840 ❑ MSDS Software
817 ❑ Personal Protective Apparel
818 ❑ Plant Maintenance
819 ❑ Respiratory Protection
820 ❑ Safety Incentives
850 ❑ Safety Monitoring
821 ❑ Security
838 ❑ Signs & Signals
822 ❑ Software
823 ❑ Training
846 ❑ Welding
824 ❑ Workers' Comp/Risk Mgmt

2. What is your projected budget for the selected products/services? (Select one)

825 ❑ Under $50,000
826 ❑ $50,000-$99,999
827 ❑ $100,000-$249,000
828 ❑ $250,000-$499,999
829 ❑ $500,000-$999,999
830 ❑ $1,000,000-$2,000,000
831 ❑ Over $2,000,000

3. How immediate is your need for the selected products/services? (Select one)

832 ❑ 0-6 months
833 ❑ 7-9 months
834 ❑ 10-12 months
835 ❑ Over 12 months

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Signature (Required) _____ **Date** _____

1. Important: Which of the following products, if any, do you recommend, select and/or buy in your job? (check all that apply)

01 ❑ Safety Equipment
02 ❑ Industrial Hygiene
03 ❑ Training
04 ❑ Software
05 ❑ Emergency Response
06 ❑ Security
07 ❑ Fire Protection
08 ❑ Occupational Health
09 ❑ Environmental Compliance
10 ❑ Ergonomics
90 ❑ None of the above

2. Please indicate ALL functions for which you are responsible:

01 ❑ Safety
02 ❑ Executive Mgmt./Administration
03 ❑ Production/Operations
04 ❑ Facility Management
05 ❑ Engineering
06 ❑ Purchasing
07 ❑ Security/Fire Protection
08 ❑ Industrial Hygiene/Environment
09 ❑ Personnel Management
17 ❑ Risk Management
10 ❑ Emergency Planning
11 ❑ First Responder
12 ❑ Law Enforcement
13 ❑ Safety Product Distributor
Medical:
14 ❑ Nurse
15 ❑ Physician
16 ❑ Other Medical Professional
99 ❑ Other (please specify)
_____

3. Which category best describes the primary end product manufactured or service performed at your business? (check only one)

INDUSTRIAL OR MANUFACTURING:
38 ❑ Oil & Gas Extraction
01 ❑ Mining
02 ❑ Construction/Contracting
03 ❑ Food & Beverage Products
04 ❑ Tobacco Products
05 ❑ Apparel & Other Textile Products
06 ❑ Lumber & Wood Products
07 ❑ Furniture & Fixtures
08 ❑ Paper & Allied Products
09 ❑ Printing & Publishing
10 ❑ Chemicals & Allied Products
11 ❑ Petroleum & Coal Products
12 ❑ Rubber & Misc. Plastic Products
13 ❑ Leather & Leather Products
14 ❑ Stone, Clay & Glass Products
15 ❑ Primary Metal Industries
16 ❑ Fabricated Metal Products
17 ❑ Industrial Machinery & Equipment
18 ❑ Electronic & Other Electric Equipment
19 ❑ Transportation Equipment
20 ❑ Instruments & Related Products
21 ❑ Miscellaneous Manufacturing Industries
22 ❑ Utilities/Waste Management
23 ❑ Transportation & Warehousing
SERVICE INDUSTRIES:
24 ❑ Wholesale/Distribution
25 ❑ Retail
26 ❑ Financial/Insurance/Real Estate
27 ❑ Professional/Scientific/Technical Services
28 ❑ Health Services
29 ❑ Education Services
30 ❑ Engineering, Research & Related Services
GOVERNMENT:
31 ❑ Fire/Rescue/Hazmat/First Response
32 ❑ Law Enforcement
33 ❑ Federal Government
34 ❑ State Government
35 ❑ County Government
36 ❑ City/Local Government
37 ❑ Military
OTHER:
99 ❑ Other (please specify)
_____

4. Which of the following products/service do you plan to purchase in the next 12 months and would like more information on? (check all that apply)

01 ❑ Emergency Response
02 ❑ Hazmat Handling
03 ❑ First Aid
04 ❑ Protective Clothing
05 ❑ Hand Protection
06 ❑ Foot Protection
07 ❑ Fall Protection
08 ❑ Head Protection
09 ❑ Eye & Face Protection
10 ❑ Hearing Protection
11 ❑ Safety Incentives
12 ❑ Respiratory Protection
13 ❑ Training Software
14 ❑ Workers' Comp Insurance
15 ❑ Ergonomics
16 ❑ Instrumentation/Monitoring Equipment
17 ❑ Plant Maintenance
18 ❑ Gas Detectors/Monitors

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> *No matter which standard you're following, keeping employees safe in confined spaces must be your number one priority. The stakes are high, yet with training and risk assessments workers can safely complete tasks.*

4. 29 CFR 1926.353 (b)(3) "Where a welder must enter a confined space..." (which still exists but is superseded by the new Subpart AA)

5. 29 CFR 1926.956 (a)(3) "When work is performed in manholes or vaults..." (which no longer exists)

However, OSHA realized that employees would benefit from construction specific standards, so they adopted Confined Spaces in Construction in 2015 (29 CFR 1926, Subpart AA standard).

OSHA is serious about keeping employers accountable when it comes to following the standards. Because health risks are elevated for employees, the fines are high too. For instance, in May 2021, OSHA proposed a $119,000 penalty to a Massachusetts electrical company because inspectors found that "machine operators and maintenance employees entered powder-coating ovens routinely without testing atmospheric conditions or securing natural gas lines and operating machine parts." As a result, employees at their Ohio facility were exposed to asphyxiation hazards. The proposed fines cover other findings related to lockout/tagout and respiratory protection.

Now that you understand the history and key terms, let's get to the differences between 29 CFR 1926, Subpart AA standard and 29 CFR 1910.146.

Who Does the Work Site Inspections

Under the construction standard, a competent person is required to conduct the inspection of the work site to identify all the confined spaces and permit required confined spaces through evaluation of the elements.

Under the general industry standard, the employer is required to conduct the inspection of the workplace to identify confined spaces and permit required confined spaces through an evaluation.

No matter who is doing the inspection, the space must be evaluated. First, an evaluation must be completed to determine if it is a confined space. Then, if it is a confined space, it must be determined if the confined space contains or has potential to contain a hazardous atmosphere, contains a material that has the potential for engulfing an entrant, has the potential for entrapment or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross section, or contains any other recognized serious safety or health hazards.

Coordinating Contractors

When multiple employers are working on a construction jobsite, the controlling contractor and entry employer must coordinate entry operations. This is critical when there is more than one entity performing an entry at the same time and when an entry is performed with activities being conducted around it that could create a hazard in the permit required confined space.

In the general industry standard, the employer is required to inform the contractor doing the work that the workplace contains permit required confined spaces and entry, the hazards identified, precautions, procedures, and the space is only permitted by compliance of a permit required space program.

Frequency of Atmosphere Air Monitoring

Continuous atmosphere air monitoring while in the confined space is required in the construction standard. Atmosphere air monitoring in general industry is required to be periodically tested, as necessary.

Engulfment Hazard Monitoring

An early warning system, that continuously monitors for non-isolated engulfment hazards, is required on construction sites. It must alert the entry employee(s) in sufficient time for safe exit of the confined space. In the general industry standard, there is no requirement for monitoring of engulfment hazards.

Suspending and Canceling Confined Space Permits

If other work around the confined space is creating a hazard or the weather is poor on outside projects, contractors are permitted to get a suspension on their confined space permits with sufficient reasoning.

General industry doesn't allow similar liberties. If work is suspended, the employer must cancel the confined space permit and obtain a new permit if there is a need to enter the confined space again.

Potential Atmospheric Hazards

Construction references five potential atmospheric hazards, including oxygen, flammable gas, combustible dust, toxic chemicals and chemicals at immediately dangerous to life or health (IDLH) concentrations.

General industry only refers to three potential air quality hazards, including oxygen, flammable gas and toxic chemicals.

No matter which standard you're following, keeping employees safe in confined spaces must be your number one priority. The stakes are high yet with the proper training and confined space risk assessments workers can safely complete tasks. **OHS**

Joseph Harkleroad *is a rising senior at Indiana University of Pennsylvania majoring in Safety, Health and Environmental Applied Sciences and an intern at Safex.*

Megan Scherer *is a Marketing Communications Professional at Safex.*

Combining Innovations for the Perfect PPE

Manufacturers have begun combining the newest innovations and technologies to suit specific applications and industries.

BY M.B. SUTHERLAND

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Whether you're talking about gloves, sleeves or clothing, comfort depends a lot on what goes against the skin. Older materials for hazardous conditions were often thick and uncomfortable, with little dexterity or movement. They also tended to trap heat and moisture, making compliance a daily headache for safety managers. Advancements in yarn and material technology now provide lighter, more breathable fabrics with extremely high cut resistance.

Manufacturers accomplish this in two ways. First, by utilizing lighter, stronger materials within the strands of yarn that make up cut-resistant fabrics. These improved yarns produce materials with a higher gauge (the number of stitches included in each inch of material) for gloves and sleeves that are up to 50 percent lighter than comparable PPE and feel more like a super-tough second skin than the thick uncomfortable gear that workers were itching to take off. That snug, but comfortable fit has the added benefit of allowing workers to pick up and assemble very small parts without removing their gloves. New yarns infused with strength-enhancing microparticles also create coreless materials for fabrics that are cool to the touch that spare workers with more sensitive skin from painful contact dermatitis.[1]

Palm Coatings for Any Application

Palm coatings have been around for years, providing solid grip on top of a variety of different glove shells. For much of that time, you had six different work glove coatings to choose from, with various pluses and minuses.

Polyurethane is light and flexible, with good dexterity and tactile sensitivity. It's ideal for dry grip and handling small parts, and it does well in light oil conditions but is less than ideal for maintaining grip in heavy oil.

Flat Nitrile is a tougher coating with excellent puncture and abrasion resistance, but it's not ideal for small part assembly since it has a bit less dexterity.

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> *Advancements in yarn and material technology now provide lighter, more breathable fabrics with extremely high cut resistance.*

Sandy Nitrile has a gritty texture to prevent slippage in heavy oils and liquids. It has good abrasion, cut, puncture and snag resistance, but the coating detracts a bit from dexterity and tactile sensitivity.

Foam Nitrile channels liquids and oils away from the glove surface to provide a better grip. It also offers excellent snag, puncture and abrasion resistance, but the foamy texture tends to become saturated in heavy liquids and oils.

Latex provides the best overall dry grip and gives you options like a foam or crinkle finish to help channel away liquid. But some workers are allergic to it and the coating tends to degrade in oils or other hydrocarbon-based fluids.

Silicone delivers a superior dry grip and increases heat resistance, but it can prevent paint adhesion in certain circumstances.

A brand-new palm coating technology was introduced just a few years ago that actually absorbs oil on the outside and keeps hands dry on the inside, all while providing a rock-solid oil grip and superior abrasion resistance. This new technology is unlike other double-dipped gloves in that it's not just a second coating of the same material that makes the glove stiffer and less comfortable. Instead, its special dual-layering system offers all the benefits above with the comfort and dexterity of a single-dipped polyurethane coated glove.

Impact Protection

Just like cut resistant gloves, impact gloves of the past did a reasonable job of protecting workers but did a poor job of keeping them comfortable and compliant. But those stiff, bulky gloves that made it hard to flex the fingers were consigned to the history books just a few years ago. These new innovations in impact protection, like integrated flex points and special vented TPR that allowed hands to move and breathe, meant you could protect workers in rough jobs like pipe fitting and heavy material handling while

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As we look forward, we aspire to continue to listen, innovate, and manufacture unique solutions. We manufacture products but aim never to lose sight of people.

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keeping them cooler and more comfortable. These were followed by lean, lower-profile impact gloves that protected workers from lesser impact hazards like those in I&E (instrumentation and electrical), maintenance, assembly, or light construction and tool work.

These innovations were exciting and groundbreaking on their own, but manufacturers took it a step further and asked how we might combine them to make PPE that addressed ever more specific needs and applications.

Innovation Combinations for the Perfect PPE

The best gloves begin with an excellent shell. So those incredibly light, cut-resistant materials were enhanced with innovations in palm coatings and impact protection. That means it's now possible to get a featherlight, highly cut-resistant shell that keeps hands cool and allows working with small parts with a solid grip–all in one glove! It's the perfect combination for anyone working in oily environments, handling large or small parts, in an environment with sharp edges like appliance manufacturing, aviation, HVAC and many other applications.

Likewise, you can take that same featherlight cut-resistant shell or, if you have workers prone to contact dermatitis, a coreless shell that's cool to the touch, along with an amazing oil barrier, grip and long-lasting abrasion protection with flexible TPR for superior impact protection. It's the dream team of innovations for pipe fitting, oil and gas work, and many other rough applications that involve liquids and oils.

It doesn't stop at gloves! Manufacturers also applied these innovations to protective sleeves with lighter, high cut-resistant materials and light and cool sleeves with impact protection. Add in hi-vis material, flame or heat resistance, winter insulation, or touchscreen compatibility—and the sky's the limit! We can create gloves with any shell, coated with any palm coating, old or new, add impact protection and even strategic reinforcements in areas of wear like thumb saddles to make gloves last longer.

More Choices, Better Protection

Therefore, if it seems like buying PPE has become more complicated in recent years, it has! But only because you have more and better options than ever before. If we've innovated it, we can combine it to keep your workers safer while making them more comfortable and compliant and making it easier to do their jobs without wanting to take off their PPE. **OHS**

M.B. Sutherland *is the Sr. Safety Writer at Magid.*

REFERENCE

1. *https://www.magidglove.com/safety-matters/choosing-and-using-ppe/avoiding-contact-dermatitis*

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Why Wear Anti-Vibe Gloves?

Sustained use of vibrating machinery can lead to severe cases of Hand Arm Vibration Syndrome that can be both debilitating and irreversible.

BY AARON SKEMP

Anybody who's ever spent a few hours weed eating, pushing a lawnmower around the yard or going for a lengthy bike ride has probably experienced it on some level: tingling and numbness in the hands and arms.

It's not your imagination. Hand-arm vibration is a real thing. Hand-Arm Vibration Syndrome is a genuine affliction that particularly affects workers who regularly operate vibrating machinery as part of their daily work routine. While HAVS can disproportionately have an effect on workers operating heavy machinery, such as jackhammers, even fewer jarring tools such as hand saws, power drills and, yes, lawn mowers, can still contribute to more modest incidents of HAVS.

HAVS is nothing that should be taken lightly, although it's admittedly disconcerting to have yet another acronym-laden malady to have to stop and consider. While occasional use of vibrating machinery may only cause numbness and tingling for a few minutes or hours, regular, sustained use of such machinery can lead to severe cases of HAVS that can be both debilitating and irreversible.

In cases such as sustained jackhammer operation, for example, an individual may suffer a loss of grip strength and decreased dexterity, an increased chance of developing arthritis, tendonitis, carpal tunnel syndrome and even experience chronic pain.

Extreme vs. Nuisance Vibration

Some of the higher HAVS risk occupations, not surprisingly, include construction, sheet metal work, welding, automotive repair and electrical work. However, even professions in the medical and dental fields carry some risk, due to the prevalence of machinery that produces high frequency vibrations that may not be as profound as a jackhammer—unless you have a particularly sadistic dentist—but sustained use of such machinery can be debilitating nonetheless.

If a job requires the regular use of any machinery that vibrates at all, the potential exists of developing HAVS to some extent or another. It's estimated that as many as two million or more workers are exposed to some level of workplace vibration of some sort. Of those workers, about half can expect to experience some HAVS symptoms.

Hard to Handle

Because of its slow-to-show, long-term progression, often times HAVS isn't diagnosed until the damage is done. It's notoriously difficult to predict from individual to individual. Some people are just more susceptible or attuned to vibrations and are, therefore, more apt to suffer HAVS symptoms, while other "hardier"

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individuals can work an entire lifetime in high vibration environments and never experience any problems whatsoever.

HAVS 101

While HAVS as a disability has been recognized as a workplace hazard for decades, the extent and variety of the symptoms have only recently become appreciated by medical professionals. Even today, HAVS is known to be an incredibly complex condition that's still not completely understood, although the symptoms are usually easily diagnosed once a patient's work history is taken into consideration.

The exact underlying mechanism responsible for HAVS is generally believed to be a disruption in the flow of oxygenated blood through the body's vascular system. This is particularly pronounced at the extremities most associated with HAVS symptoms.

Sustained exposure to vibrations can eventually damage the tissues themselves where the condition may become irreversible.

As stated, some of the early onset HAVS symptoms include tingling and numbness, which may or may not dissipate after a relatively short amount of time. With sustained vibration exposure, however, tingling and numbness can give way to more ominous symptoms. Visual manifestations can include a noticeable change in skin color, or whitening, of the extremities, which usually occurs in combination with a heightened sensitivity to hot and cold temperatures. In fact, HAVS is more likely to afflict individuals who work outdoors in extreme temperatures.

In more advanced cases of HAVS, patients may experience a loss of function to affected areas. Even mundane tasks like filling a glass of water can become incredibly difficult. In its most advanced stages, HAVS can lead to visible tissue damage, and even gangrene.

Now that you're sufficiently terrified of the prospect of having your gangrenous limbs dropping off because you ran your circular saw one time too many, there are steps you can take to decrease your chances of developing HAVS.

Assessing the Risk of Hand-Arm Vibration

Companies may perform an audit of their work environments to determine whether vibration equipment poses a risk to worker health and how significant that risk may be. Calculating those risks takes into account the level, or vibration amplitude, of various equipment that may contribute to HAVS.

The threshold vibration value is deemed the acceptable risk level workers can be exposed to with the least chance of developing HAVS. Many tool and equipment manufacturers disclose and provide vibration emission safety guidelines with their products, making it easier for businesses to research and calculate their associated risks.

In cases such as sustained jackhammer operation, for example, an individual may suffer a loss of grip strength and decreased

dexterity, an increased chance of developing arthritis, tendonitis, carpal tunnel syndrome and even experience chronic pain.

From a business perspective, conducting these kinds of vibration intensity audits, just make good financial sense. Even minor, or "nuisance," workplace vibration can adversely affect worker productivity. For workers who need to conduct minute operations, such as intricate repair work and similar projects, even minor HAVS symptoms such as numbness and tingling can be annoying at best and debilitating at worst. The bottom line is worker discomfort and negatively impacted productivity.

Obviously, the best preventative measure is to limit your exposure to regular, sustained operation of vibrating machinery and tools. If you're in a profession where that's not possible, you should take care to ensure you're at least using the tools and machinery correctly.

For example, there are literally dozens of incorrect ways to use a jackhammer. Even making minor adjustments to how you operate tools and machinery can make an incredible difference to the amount of vibration you experience. Pay attention to how veteran operators work and learn accordingly. Also, it doesn't hurt to read up on the instruction manuals.

Do Anti-Vibration Gloves Work?

Although wearing gloves may seem like a common-sense preventive measure, choosing the right kind of gloves can make a significant difference. In addition to keeping the hands warm, there are also anti-vibration gloves available on the market.

Though they're not a cure-all, finding the right-hand protection is one in a list of best practices that safety experts recommend for reducing long-term damage. It must be noted, however, that just because a glove claims anti-vibration properties doesn't mean they have actually been third-party tested to meet the requirements of ISO 10819 // ANSI S2.73—the global standard for anti-vibration gloves.

ANSI/ISO Standard Anti-vibration Gloves Require:

- Full-fingered design
- Uninterrupted palm pad from base to fingertips
- Padding ≤ 8mm thick in the palm and ≥ 0.55 times the palm padding thickness in the fingers and thumb
- Reduction of "medium range frequencies" (TM) by ≥ 10% vs. bare hand
- Reduction of "high range frequencies" (TH) by ≥ 40% vs. bare hand

Again, no amount of prevention and common sense can stamp out equipment vibration entirely. Some tools and equipment are just necessarily constructed to vibrate, so it's important to observe whatever measures we do have, including wearing the proper hand protection. OHS

Aaron Skemp is the Product Director for Ergodyne.

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Properly Choosing and Using Respiratory Protection

Understanding respirator fit testing, assigned protection factors and maximum-use concentration.

BY GREG BOOTHE

In my experience, respiratory protection is one of the more common forms of PPE used by employers in the United States. In many cases, employers may decide to use respiratory protection to reduce employee exposures to health hazards without trying to reduce personal exposures using more effective engineering or administrative controls. Because the consequences of being exposed to high concentrations of some chemicals can result in severe health effects or death, it is very important that respirators are properly chosen and worn in the workplace.

OSHA published a respiratory protection standard, 29 CFR 1910.134 in 1998.[1] The respiratory protection standard is designed to help employers establish and maintain a highly effective respirator program when respirators are required to be used in a workplace. To discuss all of the requirements of the standard would take more space than we have in this article. Therefore, I will focus on fit testing, the use of assigned protection factors (APFs) and the calculation and use of maximum use concentrations (MUCs). These are the areas where I see employers struggle the most with with comprehension and implementation.

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Respirator Fit Testing

The respiratory protection standard includes a requirement for a medical clearance for required use of tight-fitting respirators and for some specific respirators even with voluntary use. The medical evaluation is designed to determine if an individual has any medical conditions that might preclude them from being able to safely wear a respirator in the workplace. You would not want an individual donning a respirator and having a heart attack because of the respirator use.

Another requirement of the standard is to perform a fit test prior to the original use of a respirator and annually thereafter. The fit test is designed to determine which type, model and size of respirator will properly fit each individual. An employee using a respirator that does not fit properly can have little to no protection from the hazardous environment present in the workplace. You do not want an individual to don a respirator and think that adequate protection is provided only to have the worker experience a severe health reaction because the respirator is not providing the protection that it was supposed to.

There are two basic methods that OSHA has approved for determining if a respirator fits properly. These methods are referred to as quantitative fit testing (QNFT) and qualitative fit testing (QLFT). The names tell you that the QNFT method provides a quantitative result while the QLFT provides a qualitative result. Basically, the QNFT provides you with a numerical fit factor indicating quantitatively how the respirator fits the individual while the QLFT just ask if the respirator fits. Of the two methods, my experience has been that a majority of employers utilize the QLFT because it carries a lower initial investment and is easier to perform. OSHA has published the instructions for performing fit tests for the QNFT and QLFT methods in Appendix A to the regulation.

Assigned Protection Factors

OSHA developed the assigned protection factors (APFs) to assist you with the determination of maximum protection for different respirators. The APFs are listed in Table 1 of 29 CFR 1910.134.

When using one of the QNFT methods the respirator is attached to the machine and the result is displayed as a number called the fit factor. Positive pressure respirator facepieces must be converted and tested in the negative pressure mode. The fit factor and the APF are related by a factor of 10. The fit factor must be 10 times higher than the APF to correspond with the APF. Therefore, the fit factor must be at least 500 for all full-facepiece respirators and at least 100 for all quarter- and half-mask respirators in order to pass the fit test. When using the QLFT methods, the individual just has to indicate they do not detect the challenge agent in order to pass the fit test and use the designated APF. The obvious question is: when can I use the QLFT method and when do I have to use the QNFT method?

First, we must look at the different types of respirators that could be used in a hazardous environment. There are two

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> *Because the consequences of being exposed to high concentrations of some chemicals can result in severe health effects or death, it is very important that respirators are properly chosen and worn in the workplace.*

basic types of respirators, air-purifying respirators (APRs) and atmosphere-supplying respirators (ASRs). Basically, air passes through some filter in an APR which removes hazardous compound from the air prior to the air entering the wearer's respiratory system. An important variable is ensuring the filter that is being used is specific for the hazardous chemical that is present in the work environment. In other words, you need a particulate filter for particulates and a specific gas or vapor cartridge for gases and vapors. Unlike the APR, the ASR provides "clean" air to the wearer that is separate from the air in the working environment.

With a supplied-air respirator (SAR), the air comes from a tank sitting in the neighboring work area or from a compressor, hopefully operating in a clean environment. The air might also come from a tank the wearer carries on their back (a self-contained breathing apparatus or SCBA). With all ASRs, the type of regulator will have a huge impact on the protection the respirator can provide. Some regulators will maintain a positive pressure inside the respirator facepiece at all times which does not allow outside air to enter the facepiece. This is important if the area might become dangerous.

APRs and ASRs can also have different facepieces. The most common are half-mask and full-facepiece. You can find quarter-mask, but they are very uncommon. Some respirators use a loose-fitting facepiece where the facepiece does not come into contact with the wearer's face. The powered air purifying respirator (PAPR) is a special positive pressure APR using a battery powered fan to pull the air through the filter and then blow the air into the facepiece. As you can see from Table 1, whether you use an APR or ASR and the type of facepiece you use determines the level of protection that can be expected while using the respirator. In general, positive pressure respirators have higher APFs than negative pressure respirators and regulators that maintain a positive pressure inside the facepiece have the highest APFs.

Maximum-Use Concentration

APFs can then be used to calculate a maximum-use concentration (MUC). The MUC represents the highest concentration of a chemical for which you can use a particular respirator. To calculate the MUC, you must know the APF and the PEL (or the TLV or REL if you want) for the chemical. You simply multiply the APF by the PEL to obtain the MUC.

For example, the OSHA PEL for Methyl Ethyl Ketone (MEK) is 200 ppm. If you wanted to use a half-mask APR with the proper chemical cartridge the MUC would be 10 X 200 ppm = 2,000 ppm. That means you should be able to safely use a half-mask APR with the appropriate cartridges in an atmosphere up to 2,000 ppm MEK. If the concentration exceeded 2,000 ppm, you would have to use a respirator with a higher APF.

However, there is one other variable you must consider, the IDLH (immediately dangerous to life and health) concentration. If the concentration in the work environment exceeds the IDLH concentration, 29 CFR 1910.134 requires you to use specific types of ASRs and the MUC would then be set below the IDLH.

The National Institute for Occupational Safety and Health is one organization that publishes IDLH values for many compounds. The published IDLH for MEK is 3,000 ppm so your MUC is less than the published IDLH value. For gases and vapors, there is also a requirement to use a cartridge with an end-of-service-life indicator (ESLI) or develop a change out schedule. This is a requirement that many employers forget about. Another example would be if you

Table 1 Assigned Protection Factors[5]

Type of Respirator [1,2]	Quarter-Mask	Half-Mask	Full Facepiece	Helmet/ Hood	Loose Fitting Facepiece
Air-Purifying Respirator	5	[3]10	50		
Powered Air-Purifying Respirator (PAPR)		50	1,000	[4]25/1,000	25
Supplied-air respirator (SAR) or airline respirator					
· Demand mode	-------	10	50	-------	-------
· Continuous flow mode	-------	50	1,000	[4]25/1,000	25
· Pressure-demand or other positive pressure mode	-------	50	1,000	-------	-------
Self-contained breathing apparatus (SCBA)					
· Demand mode	-------	10	50	50	-------
· Pressure-demand or other positive pressure mode (e.g., open/closed circuit)	-------	-------	10,000	10,000	-------

(Respiratory Protection, 1998)


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wanted to use a half-mask APR with appropriate cartridges for an atmosphere containing hydrogen sulfide. The OSHA PEL for hydrogen sulfide is 20 ppm as a ceiling concentration. With the proper cartridges, the MUC would be 10 X 20 ppm = 200 ppm. However, the published IDLH concentration is 100 ppm, so you would have to reduce the MUC to 100 ppm.

How does this relate to when you can use QLFT methods and when you have to use QNFT methods? OSHA has stated that QLFT methods can only be used for negative pressure APRs when they will be used in concentrations less than 10 times the PEL. This is because current studies do not validate the protocols higher than that level. So, if you are going to use a negative pressure APF (half- or full-mask) in an atmosphere that is less than 10 times the PEL, you can use one of the QLFT protocols. If you want to use a negative pressure APR in an atmosphere greater than 10 times, the PEL you must use one of the QNFT methods.

OSHA allows the use of any of the QLFT or QNFT methods for all positive-pressure ASRs because they are almost always used in the positive pressure mode in the workplace. The ASRs are tested in the negative pressure mode so the facepiece must be modified for the fit testing. Once the positive pressure ASR passes any QNFT or QLFT test, OSHA allows the use of the higher APF for that respirator. **OHS**

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NOTES

1. *Employers may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.*
2. *The assigned protection factors in Table 1 are only effective when the employer implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.*
3. *This APF category includes filtering facepieces, and half masks with elastomeric facepieces.*
4. *The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators and receive an APF of 25.*
5. *These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).*

REFERENCE

1. *https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134*

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Does My Face Covering Work? Ask ASTM F3502

Each industry has its own hazards, making the search for a face covering difficult.

BY HUGH HOAGLAND, MICHAEL MCDONALD, RUWAN WIJESUNDERA, ROB TAYLOR, BRIAN SHIELS

The coronavirus made popular the face coverings in public spaces all over the world as a means to stop transmission of the virus. This means that face masks, or cloth face coverings (CFCs) were also commonly found in workplaces of all kinds.

ASTM's new F3502 Barrier Face Covering Specification, issued February 15, 2021, comes in time to improve the fit, function and other characteristics of face masks.[1] This standard was issued unusually fast in ASTM consensus and addresses everything about how to test cloth/barrier face coverings.

Function

ASTM F3502 points to several test methods or specifications to assist test labs, certification bodies, manufacturers and end users to assess and properly market CFCs for worker protection when additional respiratory protection is not needed in the work environment. These include, but are not limited to, filtration, breathability and fit or leakage assessments. Let's take a look at each one.

Filtration. The ASTM F3502 standard addresses filtration by testing 20 samples of cloth face coverings—ten in new condition and ten after a maximum number of cleaning cycles (as specified by manufacturer). These face coverings are tested for both sub-micron particulate filtration efficiency (PFE) and airflow resistance using a method similar to N95 respirator testing with modified acceptance criteria. Testing is performed on full products or, for certain products, the area of the product that fully covers the person's nose and mouth.

Since CFCs are normally made of launderable fabrics, the standard also requires the testing of PFE's impact from routine laundering or cleaning. This is most commonly accomplished by normal machine laundering to a standard test method like AATCC TM 135 (North American home laundry). But other laundry preconditioning methods are available, including ISO 6330 (European home laundry), NFPA 2112 (industrial laundry) or hand washing.

Breathability. Airflow resistance is tested by a method described in the standard but is similar to inhalation/exhalation resistance testing for N-series respirators: Method for Determination of Inhalation and Exhalation Resistance for Air-Purifying Respirators as per NIOSH Procedures TEB-APR-STP-0003 and TEB-APR-STP-0007.[2]

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classification system for airflow resistance/breathability, with Level 1 (good performance) for cloth face coverings with airflow resistance being between 5 mmH2O to 15 mmH2O, and Level 2 (better performance) having airflow resistance less than 5 mmH2O. Any cloth face covering with resistance higher than 15 mmH2O would be non-compliant with ASTM F3502.

Fit or Leakage Assessment. The F3502 Specification requires the manufacturer to self-report a leakage assessment that can be as simple as a product design analysis. For manufacturers wishing to provide a quantitative analysis, they can supplement (but not replace) that leakage assessment with F3407 Test Method for Respirator Fit Capability for Negative-Pressure Half-Facepiece Particulate Respirators to determine the leakage ratio.

Other acceptable "examples of means to accomplish a leakage assessment could include dimensional analysis, computer modeling, placement of barrier face coverings on standardized head or head/torso forms and judging their respective areas of coverage and conformity to the head or head-torso form face showing conformance to the fit and sizing characterizations of AATCC M14-2020 or performing a quantitative analysis."

Four Function Classifications

Based on the above-noted performance levels for PFE and airflow resistance, there are four possibilities for overall performance. These are based on the lowest efficiency and highest resistance measured for the 20 tested samples (inclusive of samples subjected to cleaning/laundering):

- Level 1 for both PFE and Airflow Resistance
- Level 1 for PFE and Level 2 for Airflow Resistance
- Level 2 for PFE and Level 1 for Airflow Resistance
- Level 2 for both PFE and Airflow Resistance

It should be understood that Level 2 for both parameters represents the best performance of the cloth face covering but fit is also an important consideration. It should also be noted that some individuals with specific medical conditions (adults or children) could perceive difficulty breathing while wearing a barrier face covering with Level 2 airflow resistance.

Flame Resistance vs. Flame Spread

Flame spread and flame resistance are important in some work settings, so ASTM F3502 addresses them by pointing to applicable standards. Standards ASTM F1506 and NFPA 2112 addressed providing some level of protection and assured flame resistance to the CFCs. Neither standard addressed function from a particulate filtration, airflow resistance or fit perspective. Now ASTM guides flame resistance (by pointing to proper standards) and addresses the proper function. (For Fire Fighting see NFPA 1971 and our article on the true arc flash and flame protection afforded by SCBA devices.)[3],[4]

Flame spread is tested on all clothing sold in the U.S. by regulation 16 CFR Part 1610, however, this standard does not address flame resistance as often assumed.[5] Garments can burn in this test method and most do, it is a control of "how fast" they burn. Cloth face coverings are considered wearing apparel and are subject to 16 CFR Part 1610 at a minimum, and the application to F3502 is that the material flammability/flame spread be Class 1, but for true AR/FR/FFR or other flame rated standards, the CFCs must meet the following, more stringent, standards.

ASTM F1506 for arc rated clothing and the NFPA 2112 for flash fire rated clothing committees moved very quickly to add CFCs to their scope and tone down labeling requirements and certification requirements to help workers exposed to flash fire and arc flash get the PPE they needed early in the crisis but neither of these standards addressed the fit of the CFC, function of breathability or particulate filtration. ASTM F3502 does just that.

- NFPA 2112-2018 issued their changes in August 11, 2020 in TIA 18-1, Reference: various sections in Chapter 1, 2, 3, 4, 5, 6, 7, 8, Annex A and C.[6] This was a change in labeling requirements and third-party certification. The CFCs were not defined as a product so only the components required certification to speed production.
- ASTM F1506-20a updated the standard in Nov. 3, 2020 to include CFC's with only a change in labeling requirements.

Other Requirements

Reuse must be specified by the manufacturer and if allowed, must be tested. The face coverings may not have exhalation valves. If the device requires replaceable filters, they have to be designed so they cannot be inserted improperly. Transparent parts are allowed if the design allows enough filtration to provide the source control function.

Labeling requirements include manufacturer's name, model or style number and a citation of meeting the ASTM F3502 standard. An additional product use document/packaging statement about the limits of the CFC shall also be included if the device is not also dual certified as a medical mask or a respirator, and several other requirements to meet traceability, sizing, care and use, and legislative requirements for garments. OHS

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REFERENCES

1. *https://www.astm.org/Standards/F3502.htm*
2. *https://www.cdc.gov/niosh/npptl/stps/apresp.html*
3. *https://www.fireengineering.com/firefighting/electrical-arc-flash-hazards-and-personal-protective-equipment/#gref*
4. *https://e-hazard.com/can-i-wear-an-n95-or-other-respirator-in-an-arc-flash-exposure/*
5. *https://www.govinfo.gov/content/pkg/CFR-2015-title16-vol2/pdf/CFR-2015-title16-vol2-part1610.pdf*
6. *https://www.nfpa.org/assets/files/AboutTheCodes/2112/TIA_2112_18_1.pdf*

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Achieving Operational Excellence through a Digital Worksite

It's no surprise leading organizations are transitioning to digital worksites.

BY IGOR AVLIJAS

Maintaining and enhancing workplace safety is a growing challenge for OH&S professionals as organizations and contractors are continuously being tasked with delivering initiatives—with increasing speed and complexity—that improve operational efficiency and savings. Companies leading the way have one thing in common: complete buy-in from the top-down that a safe worksite leads to a more productive worksite and operational excellence.

These innovative leaders are turning to accessible safety technology to accomplish their objectives, seamlessly gaining higher visibility of front-line activities—and threats—to make real-time fact-based business decisions and drive desired behavior.

That's why it's no surprise that an increasing number of leading organizations are transitioning to a digital worksite, which is the process of leveraging technology (such as safety wearables or area monitors) to supplement a physical worksite. This process focuses on using data from technology to gain better knowledge of worksite processes and behaviors, with the goal of increasing both safety and productivity.

With a multitude of factors impacting an industrial worksite daily—such as managing gas exposures, severe weather, chemical spills, the risk of trips and falls and more—these vast, fast-paced and complex environments make it impossible to have eyes on every worker, protecting and guiding them.

Whether it's a three-week turnaround, a multi-year maintenance contract or a construction project, small safety teams can benefit from the greater line-of-sight delivered by a digital worksite. It can also support a company's strategic corporate direction and business objectives, including its environmental stewardship and sustainability goals. With the right partner and systems, the transition is simple and seamless. Below is a short list of practical steps that safety and operations teams can deploy to make the switch to a digital worksite.

The Reasons to Digitize: What's Your Why?

Before making the transition, safety teams and their operation's counterparts must collectively align on what they are aiming to improve or achieve. Are you lacking visibility into sources of low-level or residual gas exposure threats? Is fixed gas detection equipment expensive to deploy in a way that meets your expectations? Would greater visibility of gas exposures ensure safety reporting and escalation processes are being followed? Are we losing experience due to the generational transition?

In addition to these questions, others may seek complete peace of mind that workers are operating with ideal safety behavior, ensuring individuals and the organization aren't vulnerable to significant or fatal injuries. Contractors specifically aim for zero-harm targets through technology to achieve greater safety stats, attract the best talent and win more work.

For example, many baby boomers are retiring and being replaced with a younger generation familiar with digital tools. This demographic is keen on using these resources to level up and quickly add value. Today's leaders recognize this trend, going digital to connect their workforce to a hub of in-house experts and provide the youngsters with just-in-time, on-the-job, high-value training.

What is Keeping You from Achieving Your Why?

Visibility is almost always the barrier to identifying risk and implementing safety improvements. On performance-driven sites where a small number of safety professionals are overseeing hundreds of employees, contractors and vendors, having eyes on every worker without a digital solution is simply not feasible. Some may have an idea of threats across a worksite, but the lack of visibility leaves gaps where unsafe behavior and events go unreported.

For example, many safety teams today rely on worker testimony, paper surveys and legacy systems to collect worksite information. These processes may cause personnel to unintentionally overlook inadequate safety behavior and other site threats, especially if individuals are working alone and don't have a way to call for help immediately.

Alternatively, a lone worker may experience a safety incident and choose not to report it to avoid the paperwork or out of fear of being punished. Without knowledge of the event, another worker may be put at similar or greater risk in the future.

Safety teams are also often provided with limited financial resources to make improvements and scale them across an organization. Technologies of the past that dominate most industrial facilities came with a prohibitive cost of ownership to be deployed at scale. Modern, connected and intrinsically safe wearable technology can help overcome this obstacle with a budget-friendly, scalable, quick-to-deploy and seamless solution that increases front-line visibility out-of-the-box for OH&S teams located on and off site.

You Get What You Measure: What are Your KPIs?

Most safety teams are focused on what we call the four W's: What happened to Who, When and Where. These priorities are the first step to establishing KPIs when incorporating a digital worksite.

Using the four Ws as a starting point, example KPIs may include the time the average worker spends alone each day in hazardous areas, or how long they walk through unnecessary, dangerous site locations while in transit to the lunch area. Connected wearables equipped with gas sensors can help map out exposures and fugitive emissions across a site, seamlessly, without requiring additional work.

Making improvements of this nature can be mutually beneficial to both safety and operations. For example, identifying a safer walking route may also be the faster path. No matter your KPIs, make sure to collaborate with operations during the selection and integration of a digital worksite, as the outcomes benefit both parties.

How Do I Choose the Right Technology Partner?

A few qualities exist that companies and contractors should focus

> *Companies leading the way have one thing in common: complete buy-in from the top down that a safe worksite leads to a more productive worksite.*

on when engaging with a digital worksite partner: experience, operational and financial flexibility, scalability, speed of deployment and accessibility.

Most importantly, a digital worksite partner must have extensive experience in your respective trade and vertical. It's ideal if the team has worked in the industry before, so they understand the obstacles you face. This experience will ensure you have proper counsel when incorporating data-driven practices, anticipating challenges and recommending the appropriate solutions.

Secondly, a partner must have the flexibility to work within your budget. The modern digital worksite technologies are adaptable and scalable in nature. Whether you can afford full-time support where professionals help you stand up systems and provide training daily, or you prefer occasional assistance and check-ins, the right digital worksite solution is scalable both operationally and financially—supporting worksites of any size.

Some of the greatest benefits to digital worksite deployment is its speed of deployment, robust communications, accessibility and ease of use. When engaging a technology partner, look for capabilities and platforms that enable you to review real-time and historical worksite data in a simple, intuitive and visual way. This provides the visibility needed to always have an eye on your workforce and to identify leading indicators and trends of threat to your people. It also centralizes data that allows for real-time incident response and fleet management.

The digital worksite is the present and future of workplace safety. When executed correctly, it helps further align HSE and operations, enhancing worker safety and confidence while maintaining and often improving productivity. By identifying your goals, challenges, KPIs and the right partner, organizations can begin identifying unknown risks, prioritizing initiatives and implementing improvements in a matter of weeks. OHS

Igor Avlijas *leads the Digital Worksite program at Blackline Safety.*

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Fall Rescue Plans: How to Respond in an Emergency

You need a plan of action for your crews to follow in the event of a fall.

BY DAVID IVEY

A fall incident can be a confusing and frightening event on a job site, so it is wise to have a rescue response plan carefully constructed in a clearheaded moment beforehand.

Fatalities caused by falls continue to be a leading cause of death for construction employees. Preventing falls is always best, of course, and having fall protection in place is an excellent preventative measure, but it is not enough—just as installing a smoke detector isn't enough to prepare your team in case of fire.

You need a plan of action for your crews to follow in the event of a fall. Creating a thorough fall rescue plan arms your workers with the knowledge and processes they need to follow in an emergency to prevent serious injury or death.

The Importance of a Swift Rescue Response

In the event of a fall, even after the fall is arrested, the worker is not yet out of danger. A rapid rescue is essential for preventing secondary injuries, and even death, that can occur in a fall incident, even after the danger of a direct falling injury has passed.

Fall protection harnesses are designed to arrest a fall but not for prolonged suspension. The straps and buckles that absorb the force of a fall can begin to cut off blood circulation if the worker remains suspended for more than a few minutes. While the worker remains suspended in a fall protection harness, his or her circulation is restricted, which can lead to a condition known as suspension trauma.

Suspension trauma, also called orthostatic intolerance or harness hang syndrome, is caused by the disruption of blood flow. The loss of circulation can lead to nausea, a drop in blood pressure, loss of consciousness and the onset of circulatory shock. Uncirculated blood that pools in the legs lacks oxygen from the lungs, which raises the acidity of the blood. This acidic blood can shock the liver, kidneys and heart once circulation is restored.

OSHA requires fall protection plans to include plans for a prompt rescue due to the risk of suspension trauma. In a technical bulletin, OSHA states suspension trauma can be fatal within 30 minutes and that dangerous effects of suspension trauma can occur within as little as three to five minutes of the fall.

When it comes to fall rescue, speed is of the essence. Calling the local fire department and waiting for rescue to arrive is not a good option. Having a carefully thought-out rescue plan can save precious minutes, which can translate to saving lives.

Components of a Rescue Plan

Your rescue plan should include all the information your team would need to access immediately in the event of a fall.

The first element to include in your fall rescue plan is a list of the names and contact information of authorized rescuers and first-aid trained employees. These will be the people called upon to respond to a fall incident to execute a swift rescue and, if necessary, tend to the fall victim. Only trained personnel should attempt a rescue retrieval in dangerous circumstances or provide first aid, so having a readily accessible list of employees qualified to help is key to providing timely rescue.

Next, provide employees with a complete on-site fall response checklist. Clearly and methodically think through the steps employees should follow in an emergency beforehand to provide your team with a simple checklist. This checklist will prompt any employee, regardless of their experience level or training, to run through the basic responses to a fall without forgetting an important step in the heat of the moment. Items to include on the checklist might include questions or prompts such as:

- "Can the victim be pulled to safety to avoid hanging suspended?"
- "Is the worker's harness equipped with trauma straps or attached to a self-retracting lifeline (SRL)?"
- "Do rescuers have access to a rescue ladder or lift?"
- "Have emergency services been called?"

Next, your rescue plan should include the location of all pertinent emergency supplies. This should include the location of rescue equipment (detailed below), first aid kits, defibrillators and telephones to call for help. Although the location of these items can seem obvious in the abstract, an accident can create confusion or even panic in the moment. Again, seconds matter when responding to a fall, so spelling out the location of these important items can save precious time.

You should also include a list of emergency phone numbers that should be used in the event of an incident, including the supervisors or safety managers who should be notified, the nearest medical facilities, emergency services (9-1-1 and local police and fire departments) and OSHA.

Your plan should also provide guidance on how to assess the situation once the fallen worker and all rescuers are returned to safe ground. If the victim may have sustained an internal injury, lost consciousness at any time during the incident, or remained suspended for more than a few minutes, they should be taken to the nearest hospital or medical facility for evaluation.

Rescue Equipment

Depending on the situation, you might employ one or more types of rescue equipment to help a fallen worker in suspension.

Trauma straps. Trauma straps are emergency PPE coiled into pouches attached to a harness at the hips. When hanging suspended and awaiting rescue, a fallen worker can deploy the trauma straps by uncoiling them, hooking them together, and standing on them like a bridge until help arrives. This engages the worker's leg muscles to encourage more normal blood flow and takes the weight off the harness that could otherwise cut off circulation.

Self-rescue ladders. A self-rescue ladder is portable rope or nylon ladder housed in a pouch that attaches to an anchor point and to the worker's harness. If equipped in advance, a self-rescue ladder deploys automatically during a fall, allowing the victim to simply climb the ladder to safety. Even if not equipped in advance, a rescue

ladder can be deployed from the original anchor point or a temporary anchor point within reach.

Rescue harnesses. Rescue harnesses include handles on the shoulders that allow nearby workers to hoist a fallen worker back onto safe footing. This should only be attempted for short fall distances where workers can safely reach the victim without putting themselves at risk of falling as well.

Recovery SRLs. Self-retracting lifelines (SRLs) are best known as personal fall protection devices that serve a similar function to shock-absorbing lanyards. Recovery SRLs allow a rescuer to hoist a fall victim to safety with the help of an inbuilt winch mechanism.

Aerial work platforms. A personnel lift such as a bucket truck, boom lift or scissor lift can be used to retrieve a fallen worker if one is available on site and can safely reach the fallen worker's height. Only use personnel lifts or rescue baskets intended to hold workers aloft; do not attempt to rescue workers using other construction equipment or vehicles.

Reporting an Incident to OSHA

Any fall should be treated as a serious safety incident, even if no injuries occurred. Any fall incident that results in a worker losing consciousness, requiring medical treatment beyond first aid, or missing work (including restrictions on their ability to work) is considered a recordable incident, according to OSHA. You must report these incidents to OSHA by law.

You can use the follow forms to report a fall incident to OSHA:

- OSHA Form 300 (Log of Work-Related Injuries and Illnesses)
- OSHA Form 300A (Summary of Work-Related Injuries and Illnesses)
- OSHA Form 301 (Injuries and Illnesses Incident Report)

All three forms can be downloaded from OSHA's website.[1] Record as many details of the incident as possible.

Following a reported incident, OSHA may conduct an inspection. If inspectors arrive, you must comply with their requests for documentation and information. A company representative has a right to be present and accompany all walkaround inspections.

Following the walkaround, the OSHA inspector will discuss any observed violations. You can ask them questions about standards being cited and about the severity or penalties, but do not argue or try to negotiate. Ask them to send your company a record of any citations. Keep good notes and take photos and measurements during or immediately after the inspection. Correct any unsafe conditions the inspection revealed as quickly as possible.

We all hope to avoid workplace accidents and do what we can to prevent falls. With any luck, you will not ever need to employ your rescue plan. But it is far better to have a plan, and not need it than to need a plan and not have it. **OHS**

David Ivey *oversees the product development of fall protection and safety equipment at Malta Dynamics.*

REFERENCE

1. *www.osha.gov/recordkeeping/RKforms.html*

Excelling at Safety Means Making Worker Well-Being a Priority

Leaving the worksite pain free for activities outside of work is critical for a healthy worker and a safer jobsite.

BY KRIS CORBETT

Some construction workers embody the "too tough to worry about it" mentality which includes an attitude that nothing terrible could happen to them. With this kind of demeanor, discussions of wellbeing can seem out of place. The common perception is that seasoned construction workers should be able to handle health and emotional issues, bravely soldiering on until the work has ended.

The truth is that health and well-being are important for all workers, regardless of their industry. Many companies, specifically construction, need to shake off the old perceptions and start taking a proactive approach in managing and protecting the wellbeing of its workforce and aligning strategies found in the NIOSH Total Worker Health (TWH) approach to make a perfect business sense.

TWH is defined as policies, programs and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.

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Construction Trends

Injury Rates. Despite advances in construction safety the industry continues to face high rates of fatal and non-fatal injuries and accidents among its workers. Injury rates are 71 percent higher than any other industry with 1-10 workers injured annually and, unfortunately, 50 percent of those serious injuries go unreported.[1]

Addiction. With staggering injury rates, it's not surprising that workers in the construction industry are most likely to misuse prescription opioids compared with other employee groups according to the study published by the Center for Drug use and HIV/HCV Research at the New York University College of **Global Public Health.** The high rate of injuries and the physically demanding work can lead to treatment or self-treatment with pain medication, alcohol or other addictive drugs.

Aging Workforce and Health. As with all industries, the baby boom generation is moving towards retirement and fewer young workers are entering the industry. As a result, the average age of a construction worker is increasing and will continue to do so.

Chronic Disease. This is an epidemic in the U.S. with six out of 10 Americans having one chronic disease and four of those six having two or more chronic diseases.[2]

Silent Killer. In 32 states, the risk of suicide among male construction workers was five times greater than the rate for all fatal work-related injuries in 2018, according to the CDC.

We have always known construction work to be physically and mentally demanding. We can no longer sit back and watch chronic injuries and illnesses force many experienced trade laborers to retire early, change professions or increase safety risks on your jobsite due to the health status of the workforce. A growing body of evidence suggests that significant benefits can occur when health and safety are integrated, that's why the most successful programs are those that blend a holistic approach to form a continuum that can lead to a true culture of health and safety.

Strategies

Wellness Promotion. Focusing on health factors (nutrition, stress, sleep, physical activity, etc.) that are not directly related to the work, but can still be impacted by being in the construction industry can make a positive impact to your workforce. By implementing a wellness plan for your next project, it can lead to improving overall health, increasing productivity all while improving safety.

Toolbox talks on health and wellness, wellness challenges, health fairs, healthy vending or food truck options are great ways to promote health and wellness on the jobsite.

Emotional Health Resources. In the construction industry, mental health awareness and suicide prevention are part of ensuring a safe job site for every single worker.[3] If your company is committed to safety, then it must also be committed to mental health; the two go hand in hand. Now is the time for the industry to STAND UP for suicide prevention and address it as a safety and health priority.[4]

Make sure your workers have resources available to them for emotional health and bring awareness to the project's commitment to suicide prevention.

Addressing the stigma of reaching out for help must be paramount.

Injury Prevention and Opioids. Unfortunately, nearly any job in any industry can be the source of discomfort or pain for workers. According to the CDC, the most common treatment for chronic pain over the last 20 years has been opioids. Because of the addictive nature of the drugs, they can be a danger to both the injured workers and the workplace, particularly if the worker is operating equipment or machinery. Stopping the demand for opioids starts with preventing the need for them. That means preventing pain before it starts and preventing workers from being hurt on the job.

Getting Ahead of Injury

Companies are beginning to look at investing in ergonomic programs, training, and at providing a resource that assists with the early onset of musculoskeletal issues through early intervention.

Early Intervention programs emphasize the early reporting of soreness or discomfort, prior to a major disfunction or documented injury. Quite simply, the strategy addresses an ache before it becomes a pain and a stress before it becomes a strain. Programs operate under the umbrella of "evaluation and first aid" as defined by OSHA, versus addressing the risk through traditional physician consultation. These programs are typically staffed by an Industrial Athlete Coach (licensed physical therapists or certified athletic trainers) that are musculoskeletal experts.

These licensed personnel provide first aid care of musculoskeletal discomfort defined by OSHA which includes ice or heat, over-the-counter anti-inflammatories, elastic tape or non-rigid splinting, postural balance stretching and massage. In numerous case studies, nearly 90 percent of all reports of discomfort using these types of early intervention solutions can effectively address and resolve a worker's discomfort.

However, addressing symptoms alone may fail to address why the discomfort occurred in the first place. Having an early intervention resource that works to review work methods, identify the root cause of the discomfort, provide the employer ergonomic guidance or employee coaching on how to avoid further injury can help stop the cycle of pain—ultimately reducing the need for the opioids in the first place.

Business Case for TWH

Blending a TWH approach can also be an effective recruiting tool. It's a tool that will make it clear that you're invested in your workers as people. Giving your workers/contractors the tools to perform at the top of their game mentally and physically is crucial to your project and the company's success. Workers who leave the job site pain free with "gas left in the tank" for activities outside of work are critical for a healthy worker and safer jobsite. OHS

***Kris Corbett** is the Director at Atlas-IPS.*

REFERENCES

1. *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2491397/*
2. *https://www.cdc.gov/chronicdisease/about/index.htm*
3. *https://preventconstructionsuicide.com/Are_You_at_Risk*
4. *https://preventconstructionsuicide.com/STAND_UP_for_Suicide_Prevention*

Building Boldly: New Safety and Regulatory Realities

The construction industry continues to be the most dangerous to work in America.

BY GREG ENRIGHT

On the afternoon of August 24, 2020, a construction laborer employed by an electrical contractor was preparing to install a new power line between two utility poles at a Tennessee construction site. The worker threw the guide twine, used to pull the cable, toward the next pole, but it arched higher than intended and made contact with the distribution power lines. Flowing through those lines were 2,700 volts of electric current, which traveled down the guide twine to the worker, who was electrocuted.

Less than half an hour later, in North Carolina, a crane inspector was preparing to carry out a monthly inspection when the crane's moving counterweight struck the individual, who suffered blunt force traumatic injuries and was killed.

Sadly, this kind of day is often the rule rather than the exception in the construction industry, both in the U.S. and around the world, with workers routinely suffering fatal and life-altering injuries while working to build the vital infrastructure on which we all depend. The construction industry continues to be the most dangerous in which to work in America. According to OSHA, about one in five worker deaths (1,061) in the private industry in calendar year 2019 occurred in construction.

What are construction companies doing to improve the safety of their workers in the face of such stark circumstances? We will examine how they are handling compliance regulations, how new technologies such as connected worker solutions are helping, what change management initiatives are in play, the latest in training strategies and what the future of construction might look like.

Regulatory Rethink

OSHA's Top 10 list of most frequently cited standards for 2019 includes three that specifically mention the word "construction" in their title: Ladders, Construction (No. 6), Scaffolding, General Requirements, Construction (No. 3) and Fall Protection, Construction, which came in at No. 1, for the ninth straight year.[1] Additionally, the U.S. Bureau of Labor Statistics found that fatalities in construction and extraction occupations increased by six percent in 2019 from the previous year.

Greg Sizemore, vice president of health, safety, environment and workforce development at Associated Builders and Contractors (ABC), reminds us that OSHA standards are "not to be considered as the highball in safety performance, but the bare minimum."

According to Sizemore, a construction company that puts up industry-leading safety performance numbers is one that has a safety-focused culture in place, and that culture starts right at the top with the CEO.

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"[Employees] will see and recognize whether that leader is walking the walk and talking the talk," Sizemore said. "So, as a CEO, when you go out to a job site, are you wearing the same PPE that you're requiring your employees to wear? Or are you still in your loafers and your khakis and your Ray-Bans, as opposed to steel-toed boots, a hard hat and safety glasses?"

If it's in place at those corporate office heights, a culture of safety will conceivably cascade through lower management ranks and onto the actual construction sites.

While the commonly cited OSHA standards are not likely to be reduced in frequency any time soon, Sizemore does expect to see a growing emphasis on substance abuse policies.

"As an industry, we cannot allow substances to take over," Sizemore said. "If your son or daughter is rigging the load below a tower crane, and that operator happens to be under the influence of an illegal substance as they're pulling the levers and lifting that load, you'd want to know that that operator is in 100-percent tip-top capacity to do their job."

In the United Kingdom, many observers expect the tragic Grenfell Tower fire of 2017 to continue to have an effect on future regulation directions set by the Health and Safety Executive (HSE), the U.K. government agency that oversees workplace health and safety.

"This will include improvements in building standards, governance, fire safety provisions and maintenance and more. The impacts of this will be very far-reaching," says the head of health and safety at a U.K.-based manufacturer of clay- and concrete-based building materials.

Training is Key

The social distancing requirements necessitated by the pandemic have made in-person training considerably more difficult, if not impossible, for many construction companies. And even if some traditionally face-to-face training exercises can conceivably be ported over to computers into a virtual alternative, that option is not a practical one for many firms.

"Any courses that require a practical element have been a challenge if close contact working is required," admits the health and safety professional at the U.K. company. "Several courses have been put off until face-to-face becomes viable again. The main reason is that the thought of a two-week health and safety course being delivered virtually is mind-numbing to most people."

Training to maintain continuous professional development, which is normally practice-based on a site across multiple companies, such as that for the company's quarry managers, has also been affected, he added. "It has been difficult to come up with alternative ways of learning for this type of information."

Some shorter courses, he said, have been delivered online with some success. "That's something that we would not have considered before the pandemic."

For global construction companies, training is a complicated affair even without a pandemic.

"We are a very high-turnover industry, with a lot of market volatility," said a representative of a global provider of engineering and construction solutions to the oil and gas industry. "So, with that comes a lot of challenges in training our workforce. We have people that are working all over the world, and our workforce is diverse. We've got people from all cultures and backgrounds, so navigating that can be challenging, along with the rules, regulations and requirements associated with each location that we work in."

Whether the training is virtual, in-person, pandemic-affected or not, ABC's Sizemore stressed the importance of verification of skills learned once the exercise is completed.

"The thought of someone simply being chained to a desk or staring at a monitor for 30 minutes on a particular topic, and that information being something that they will immediately take onto the job, is fairy dust," Sizemore said.

Therefore, there has to be a means to justify that individual's competence in the task for which they are training. This can take the form of a simple question and answer session from the supervisor. "It doesn't have to be an inquisition. It's saying, 'Since you now know how to inspect a grinder before you use it, or since you learned what personal protective equipment you need to have on to use this tool, show me before you start to do it.'"

Root Causes, Connected Workers and Technology

Fortunately, a plethora of new technologies have become available to help increase safety on construction sites. Many firms are adopting wearables—garments or other objects containing electronic sensors that can be worn just like any other typical work garb, such as safety vests, gloves or protective eyewear.

Research provides compelling evidence that wearables can make a difference. A 2019 study looking into their effectiveness evaluated 251 NIOSH Fatality Assessment and Control Evaluation (FACE) reports[2] and concluded that the active hazard in 73 of them (29 percent) could have been prevented with a wearable device. The report also looked at 29 cases from 2018 in the OSHA archives and revealed that wearables could have played a role in preventing one-third of them.

While wearables help to mitigate immediate dangers to construction workers, various forms of health and safety software systems are helping to create a safer future. The representative for the oil and gas provider said his company is utilizing Root Cause Analysis (RCA) software to better understand its health and safety risks. RCA analyzes incidents to discover root causes and address the source of the problem to prevent their re-occurrence.

"We knew what the problems were, but having a system showed us that trend and demonstrated it. It brings a lot of value," the representative said. "It makes sure that people are aware of the problem and brings it more to the forefront."

Although the stereotypical construction scene is a picture of hustle and bustle with many workers carrying out their responsibilities within close proximity of one another, the reality is that many building tasks are performed by lone workers in remote locations. Traditionally, a fall or other mishap in these situations could easily turn deadly with no one around to help a laborer in distress.

A wide range of connected worker technology has become available in recent years to help mitigate this risk by maintaining a line of communication between lone workers and their construction teams. ABC's Sizemore noted that new technologies can be confusing and intimidating for contractors and management in smaller construction firms. Others simply don't have a lot of time to research their benefits and move toward a purchase and implementation.

"Whether it be drones, or tracking, or tracing, those are

technologies that, in the day-to-day fight of just doing a project, many contractors in small shops just don't have time to fit it in," Sizemore said.

To help primarily small and mid-size shops, ABC has launched its Tech Alliance[3] program, a group of 13 construction technology companies that collaborate on tech resources for the association, including a beta testing/free technology program and educational webinars.

Construction's Health and Safety Horizon

Just like many of the edifices it produces, the construction industry itself reflects the ever-changing societies and cultures in which it exists. As the world evolves, companies will have to evolve along with it. How well they manage this change will determine how successful they are at taking their safety efforts to new levels.

At the U.K. company, change management today is strongly linked with sustainability. "It's driven by our customers and shareholders alike," says the company's head of safety and health. "As this is a renewed focus, outputs so far are not quantifiable, but our objectives stretch to 2030 on this topic."

Technology in the form of a change management software tool has been the nexus for change management efforts at the oil and gas firm. "Prior to that, we had a paper-based tool, but this provides a way to analyze the risk associated with change, to engage the stakeholders and to monitor and measure the implementation of that change," said the company representative.

In Sizemore's view, the traditional focus on a construction worker's physical safety will be widened in the coming years to include what ABC refers to as Total Human Health.[4] This concept considers the entire well-being of an employee, encompassing not only physical safety but also mental health, addressing issues such as anxiety, depression and suicide.

The pandemic may, in the long run, prove to be a spur to action around this issue, he notes.

"It has created an increased risk for depression and anxiety. The isolation of social distancing has had a significant impact on people, and we need to take this as an opportunity to improve our industry and expand our safety dedication." **OHS**

Greg Enright is a veteran writer, reporter and editor who has written extensively Health and Safety and often writes for Intelex Technologies.

REFERENCES

1. *https://www.osha.gov/top10citedstandards*
2. *https://wwwn.cdc.gov/NIOSH-FACE/Default.cshtml?state=ALL&Incident_Year=ALL&Category2=0005&Submit=Submit*
3. *https://abc.org/Education-Training/Tech-Alliance*
4. *https://abc.org/Safety/Preparedness4*

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Tag In Supervisors on Lockout/Tagout Training

In rare instances, procedures like LOTO are overlooked due to blatant disregard.

BY RAY PREST

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Lockout/tagout is a great example of traditional workplace safety in action: identify a hazard, put a procedure in place and train workers to follow that procedure in order to avoid exposure to the hazard. It's a nice, clean solution and one that's proven to be incredibly effective.

There's just one catch—it only works when all employees follow the procedure to the letter. However, you can design the most elegant, precise procedure in the world and workers will still fail to follow it for all sorts of reasons. In rare instances, procedures like LOTO are overlooked due to blatant disregard. Much more frequently, the rules are unintentionally violated. People momentarily forget because they're tired, they've become complacent or they're in a rush.

Lockout/tagout rules aren't new, and the standards that govern the control of hazardous energy have remained fairly consistent for a long while now. But for the last two decades—as long as I've worked in the safety industry—the issue has been among OSHA's top 10 most cited violations. So, in addition to employees following procedures to the letter, maybe the letters of the procedure also need to follow employee behavior. The rules governing lockout/tagout are sound, and there's no need to re-invent the wheel. But something more is required. I'd like to propose that supervisors are the key to reliably governing the lockout/tagout.

It would be great if you could create procedures, training plans and systems that would account for all of the unique combinations of equipment, people, human factors and situations that can arise on any given day without permanently locking down their entire plant. However, unless you can squeeze an extra dozen hours into each day, that's not a realistic option.

Instead, safety managers need to supplement their standard program with dynamic support on the ground to fill the inevitable variability gaps—which means they need to empower supervisors to deal with the LOTO problems that creep in at the margins.

Shift supervisors and other frontline leaders are such a useful feature of a strong lockout/tagout program option because they can act as a bridge between employees and organizational safety systems. On the system side, supervisors can be the company weathervane, indicating which way the safety winds are blowing. On the individual side, supervisors can offer key support to employees who need it, when they need it.

Supervisors and Systemic Rushing

Lockout/tagout violations are typically viewed as a personal contravention of a system that was built to run just fine—an individual throwing a wrench in the safety gears, so to speak. But in many cases, what looks like an individual rushing through a task and skipping a few safety steps is actually a function of organizational priorities.

Over the last three decades, the organizational sciences—the collection of disciplines and subfields that study how large groups of people interact and behave in structured environments—have conclusively determined that workers' actions are a reflection of the system in which they occur. When people act in certain ways, there's a reason for it. If people aren't following the LOTO procedures, it's worth taking a close look for any structural reasons that might be contributing factors. Often, it comes down to a handful of issues: inadequate training, institutional pressures and a failure to mitigate complacency.

In the case of inadequate training, there's not much I can tell

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COVID-19 has forced all of us to change many aspects of our lives, especially our workplaces. Since March 2020, thousands of businesses have been forced to close their doors, at least temporarily, causing literally millions of Americans to become unemployed. Now employers are starting to reopen their businesses and those who lost jobs are eager to find employment and get back to work.

Studies show that during a national crisis, substance abuse increases dramatically. According to the CDC, 13 percent of Americans reported starting or increasing substance use as a way of coping with the COVID-19 pandemic, and overdoses have spiked since the onset of the pandemic. Additionally, the use of opioids and amphetamines has increased over 215 percent. Now is not the time to consider suspending a drug and alcohol testing program. It is actually time to recommit to pre-employment and random testing, and consider alternative testing methods that make it possible to continue testing regardless of obstacles such as social distancing requirements.

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- **Science.**"The scientific basis for the use of oral fluid as an alternative specimen for drug [and alcohol] testing has now been broadly established… [as an] alternative specimen to be used in federal programs with the same level of confidence that has been applied to the use of urine."[1]

A typical oral fluid collection is employee-driven, meaning the employee physically conducts the collection themselves, without the collector ever touching the collection articles and containers. This significantly reduces the possibility of any exposure to the COVID-19 virus via a donor's saliva because the collector never comes in contact with the donor's sample. The sample can also be collected using all recommended safety precautions with minimal contact keeping both the collector and the employee apart during the collection process.

REFERENCE

1. *https://store.samhsa.gov/sites/default/files/d7/priv/sma12-4668.pdf*

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> *Lockout/tagout rules aren't new, and the standards that govern the control of hazardous energy have remained fairly consistent for a long while now.*

you except to do the (expletive) training until it sticks. Stop reading right now and figure out how you're going to educate workers on the proper lockout/tagout procedure as soon as possible. Don't let organizational pressures cause you to rush through the development of the procedures (like using one generic procedure to cover differing equipment or situations) or take a shortcut on the training due to operational time constraints (like only training authorized employees and not affected ones). Full stop.

The other issues are a bit more nuanced. Sometimes there are systemic pressures that induce employees to work fast, enough to increase their risk of omitting some or all of the steps in controlling hazardous energy. More often than you'd like, an organization doesn't take sufficient steps to combat people's natural tendency to forget things. These issues can be addressed by better using supervisors' natural position as the liaison between frontline workers and organizational systems.

Supervisors are able to communicate above to operations and safety managers, below to individual employees and laterally to maintenance personnel. When production demand requires a sustained period of working at a faster pace than normal, supervisors can deliver additional just-in-time safety reminders to workers while also letting management know when rushing and other human factors build up to a degree at which they're seriously compromising safety.

Supervisors can play a similar role when it comes to managing LOTO-related complacency. Frontline leaders can keep an eye out for signs of non-compliance and pass their observations up the chain, while also providing timely reminders of the need to control hazardous energy on the shop floor. This is especially important because near-misses—which are an early warning sign of complacency setting in among workers—are much harder to catch for lockout/tagout. Relying on supervisors allows the safety manager to be more proactive about stemming the tide of LOTO complacency.

Additionally, supervisors can help combat the forgetting curve—the fact that people forget roughly 90 percent of something they've learned within a month. If your lockout/tagout training is limited to a single class or a once-per-year event, then you need to account for that in your plans. Create checklists, posters and get supervisors to provide reminders after the classes. Get people to recall and communicate the procedures to you during walkthroughs and inspections and ask supervisors to do the same on a regular basis. Critically important issues like LOTO can't be left to memory, and supervisors have the daily rapport with employees that they can leverage to provide frequent LOTO reminders.

Supervisors and Individual Interventions

Supervisors are also able to support stronger individual skills among workers through one-on-one conversations. It's a rather simple but powerful form of intervention: whenever a supervisor notices a potential LOTO issue brewing, they pull the employee aside to have a positive, constructive conversation that's designed to improve future behavior. This is particularly useful when lockout/tagout procedures are compromised by human factors like rushing, which are 'sometimes' problems for many companies. Mental and physical states fluctuate throughout the day, and workers likely only rush through the LOTO process some of the time. Given their vantage point at ground level, supervisors may be the only organizational leader who can spot the issue and intervene.

In lockout situations where multiple people are involved (such as authorized employees, affected employees, a maintenance person and/or contract equipment technician), supervisors can be pivotal in offsetting group issues that can arise from a lack of communication, ambiguity around who's doing what, inaction due to distributed responsibility and rushing.

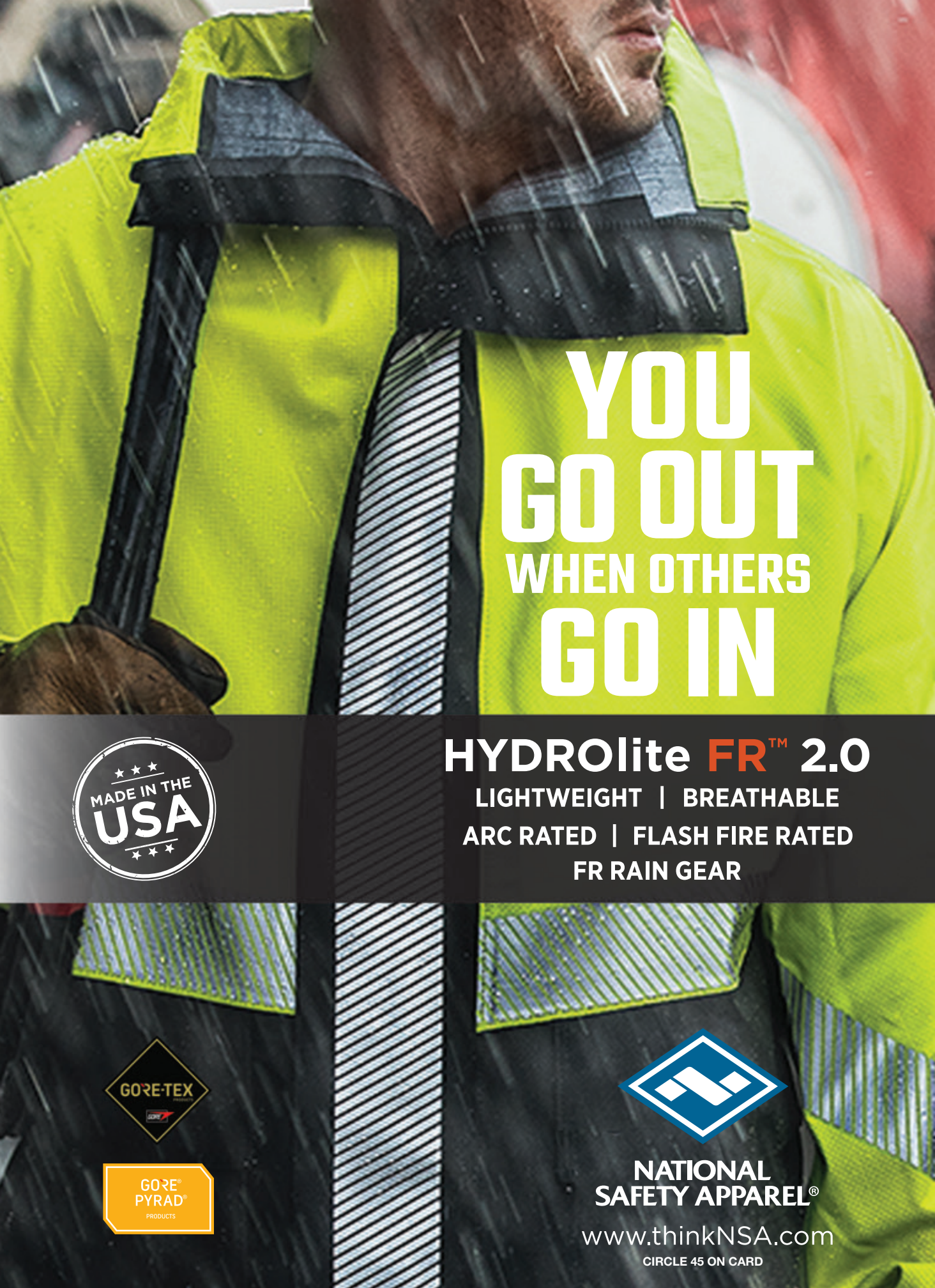
Many studies have shown that as the number of people in a group increases, individuals are less likely to act, intervene or even see an emergency developing. This happens because individuals in groups tend to look at others for cues, assume someone else will act, or they follow the lead of the person of authority. An affected employee may not speak up because they think the authorized employee must know what they're doing. This behavior is amplified again by rushing, being in a hurry or unaware of those around you.

The famous Good Samaritan study showed that "being in a hurry" was the single strongest determinant in whether people would stop to get involved in others' situations. A supervisor can combat this by being the central authority and over time building a psychologically safe climate where speaking up is the norm. Having robust human factor knowledge among all staff makes it easier to see how anyone can make a mistake, miss an important step or take a shortcut under routine or extreme situations.

If there's one big catch with the standard lockout/tagout procedure, then there's also a catch with using supervisors as part of the solution. For frontline leaders to effectively reduce LOTO-related issues, they need good communication skills, strong safety knowledge and a well-rounded understanding of human factors like rushing and complacency. You don't need me to tell you that relatively few supervisors possess all three.

There are several ways to help your company's supervisors learn more and improve their skills, from micro-learning and targeted education to more wholesale supervisors training centered on human factors and developing the ability to intervene. While each has its merits, the most important decision you make isn't so much how you train supervisors as it is to recognize that lockout/tagout compliance and supervisory skills may be a lot more closely aligned than you think. OHS

***Ray Prest** is the Director of Marketing at SafeStart.*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Steps to Increase Safety and Strengthen LOTO Training

Preventing injury and loss of life is undeniably the number one reason to strengthen any safety program.

BY JOANN MRGICH, COLWIN CHAN

Crushed, fractured or amputated limbs, electric shock, explosions and heat/chemical burns—these are just some of the dangers workers face when stored energy is unexpectedly or accidentally released.

Stored energy is found in nearly all sectors of industrial business, and when it's not properly controlled, it can easily result in serious injury or loss of life. Controlling stored energy such as, electricity, kinetic energy, thermal energy, pressurized liquids and gases is critical to keeping workers safe.

The best way to help your team safely work with stored energy is to ensure you have a strong lockout/tagout (LOTO) training program for controlling hazardous energy.

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Business Benefits of Strengthening Your LOTO Program

Preventing injury and loss of life is undeniably the number one reason to strengthen any safety program. However, there are also concrete business benefits, for example, according to the National Safety Council (NSC) Injury Facts report online, work injuries cost employers $171 billion dollars and $105 million days lost in 2019 alone.

Strengthening LOTO training specifically, helps reduce the chance of costly OSHA fines for serious violations (i.e. injury or death) which start at $13,653 per violation. LOTO infractions routinely make the annual list of most common OSHA violations, coming in sixth during the 2020 fiscal year.

Additionally, strengthening your lockout/tagout program will include standardization. Standardizing any process increases efficiency. The time/resources you spend codifying and organizing your LOTO training program will be rewarded with time/resources saved over time with more efficient processes in place.

Step 1: Identify Authorized, Affected and "Other" Employees

Authorized employees and affected employees require different levels of LOTO training and retraining. The first step to strengthening your program is to identify authorized and affected employees so that you can ensure each team member is receiving the proper training.

Authorized employees. Anyone who locks out or tags out machines/equipment in order to perform service or maintenance must receive LOTO training to become authorized. Employees become authorized after receiving LOTO training for applying, using and removing energy controls.

Affected employees. Anyone who operates or services machines/equipment that require de-energizing for safe maintenance, or works in "an area in which such servicing or maintenance is being performed." (OSHA 1910.147b)

It is important to note here that affected employees can be re-categorized as authorized employees (and thus require authorized-employee training) if their duties change to include service/maintenance of machines/equipment that require de-energizing.

"Other" employees. Anyone who does not fall into the authorized or affected category, but whose work may require them to be in an area where lockout/tagout is performed.

Step 2: Review OSHA Requirements for LOTO Training

LOTO training requirements are covered in OSHA standard 1910.147, The Control of Hazardous Energy. This standard is also referred to as the LOTO standard or lockout/tagout standard interchangeably.

Following regulation 1910.147(c)(7)(i)(A), authorized employees must be trained on the following: 1) recognition of applicable hazardous energy sources, 2) details about the type and magnitude of the hazardous energy sources present in the work area and 3) the methods and means necessary to isolate and control hazardous energy sources.

Affected and "other" employees are covered under 1910.147(c)(7)(i)(B) and 1910.147(c)(7)(i)(C), respectively. Affected employees must be trained to understand the purpose and use of energy control procedures. All other employees working nearby must be instructed about the procedure and the fact that it's prohibited to restart or reenergize any machine/equipment that is locked out or tagged out.

Step 3: Get Procedures Down on Paper

Written lockout/tagout procedures are a must. OSHA 1910.147(c)(4)(i) specifically mandates those procedures "be developed, documented and utilized." Clearly documented safety procedures also make it easier for employees to learn and follow protocols. Storing a copy of LOTO procedures in a heavy-duty binder makes them easily accessible to employees as well as inspection officers.

Digital records are great for saving space but can be difficult to access. If you do choose to store procedures digitally, consider displaying barcode labels for digital access in high-traffic employee areas. Using label design software, you can easily create your own QR barcodes that link to information online. Anyone with a smartphone can use a QR code to instantly go to the link.

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Step 4: Standardize Training Materials and Organize

1910.147(c)(5)(ii)(B) requires both lockout and tagout devices to be standardized within a facility. This includes shape, size or color for locks, print and format for tags. Standardization is important in safety procedures because it makes dealing with known hazards routine and easier for employees to recognize on sight. Applying the same principles of standardization and keeping training materials organized can also help strengthen LOTO safety in your facility.

First, clearly identify training materials for authorized, affected and "other" employees to ensure that the right information is getting to the right people. Use standardized labels, color-coded binders or dividers to make it easy for employees to quickly navigate to the information they need.

Next, make sure training information is not only accessible but digestible. Well-organized materials allow you to provide much more information for employees in a wide variety of formats. Training materials that range from whitepapers and your full company policy for controlling hazardous energy, to short OSHA handouts or links to videos online, accommodate a wider variety of learning styles. The more resources available to your team, the more knowledgeable they become, increasing LOTO safety in your facility.

Step 5: Streamline Training Records

1910.147(c)(7)(iv) requires employers to certify that training has been completing and is being kept up to date with certification records that contain each employee's name and the dates of their training. Whether you store LOTO training records physically or digitally, it's a good idea to standardize a system for separating records for authorized, affected and "other" employees.

Keeping your records streamlined and organized will help save time during OSHA inspections as well as in-house inspections and/or retraining. If you're storing records physically, ensure that you use heavy-duty binders, sheet protectors and plastic dividers that will not degrade in an industrial setting.

Step 6: Reinforce Best Practices and Training Basics

Provide visual tools to help your team stay vigilant. For example, posters, safety signs, labels and tags that reinforce best practices, training basics and protocols that are unique to your facility.

Every authorized, affected and "other" employee working with machinery/equipment that stores hazardous energy should know the six steps of LOTO safety by heart.

Safety posters featuring the six steps of LOTO safety and other LOTO training procedures specific to your facility are a great way to help workers commit important information to long-term memory and/or review daily as needed.

Step 7: Conduct Periodic LOTO Inspections

LOTO inspections are covered under OSHA 1910.147(c)(6) and require that an authorized person inspects the facility's total energy control/lockout tagout procedures at least once a year. However, it's considered best practices to conduct an inspection in the following instances: 1) after retraining has occurred or 2) if you suspect procedures are not being followed.

During lockout/tagout inspections, OSHA requires the following:

> *The best way to help your team safely work with stored energy is to ensure you have a strong lockout/tagout (LOTO) training program for controlling hazardous energy.*

- All procedures for each machine must be inspected
- Employees cannot inspect themselves
- All authorized and affected employees must be reviewed (group reviews work, OSHA does not require individual reviews)
- The employer must certify inspections have been done
- Certification must identify the machine/equipment and include the procedure, the date, the employees involved and the person who performed the inspection

Step 8: Facilitate (and Record) Retraining as Needed

1910.147(c)(7)(iii) covers retraining employees in LOTO safety. At minimum, retraining must occur when: 1) there is a change in job assignments for authorized or affected employees, 2) a change in machines, equipment or processes present a new hazard or 3) there is a change in energy control procedures.

OSHA also mandates that additional retraining must be given to employees "whenever the employer has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures." This can happen after a routine inspection or any time the employer has any reason to question the employee's proficiency.

Employers must certify LOTO retraining in the same manner as regular LOTO training (i.e. including the employee's name and the dates of their training). Use the same record management procedures for training and retraining certification to increase standardization and efficiency.

Benefits of Strengthening LOTO Training

Whether you're building your LOTO training program from scratch or updating your current program, a few key fundamentals make all the difference. Identify employees to ensure the right people get the right information. Document, standardize and organize the specific lockout/tagout procedures in your facility, certification records, inspection records and training materials. Reinforce best practices and conduct regular inspections to keep everything on track. OHS

JoAnn Mrgich *is a technical & content writer for Avery Industrial.*

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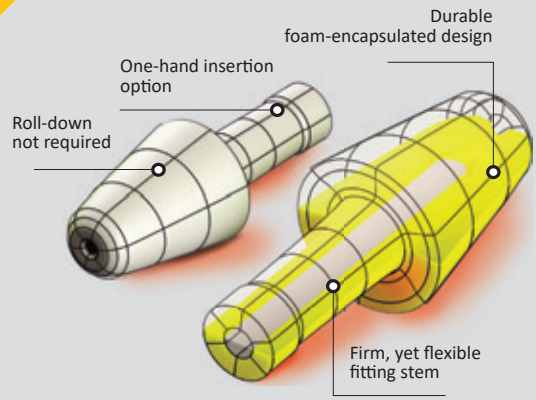

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Lockout/Tagout Can Save Lives

Always consider the electrical issue as it relates to lockout/tagout.

BY JEFFERY BUCKAU

In the safety world, one tends to think of lockout/tagout as an electrical problem. People dealing with energized equipment spend significant amounts of time working through the de-energization process to ensure that electricians and quality control people are kept safe from bolts of current flowing through conductors or components. As safety professionals, we need to always consider the electrical issue as it relates to lockout/tagout.

However, there are so many other items to consider when talking about the unexpected release of stored energy in the direction of workers. Some might call it a "line of fire" issue. A lot has been made of the avalanche issue from this past winter season. Snowpack on the side of a mountain has the potential for that unexpected release of stored energy. Millions of tons of snow sliding off the side of a mountain would surely have dramatic impacts on those in the way of the rushing snow slide.[1] However, it isn't like one could lockout/tagout the side of a mountain, right? Actually, you can. The ski patrol usually does this through proper signage and barricading.

At work, there are many times where stored energy is found near the worker. Gravity, chemical, high pressure, steam, hydraulic, mechanical, etc. are all found on worksites every day. If we were sitting in a classroom, a discussion could be held where examples for each of the items listed above would be explored. Stop for a moment and think of the last time you walked around your worksite and looked specifically for those areas where stored energy might be found.

One such example to discuss would be the case of the mechanic who was working on a cement truck.[2] The truck had a mechanical problem where the mechanic had to climb under the rotating drum to complete the fix. The mechanic placed a "do not operate" sign on the steering wheel of the vehicle, the vehicle was turned off, and the key was removed. However, somehow someone was able to climb into the cab, remove the steering wheel sign and place another key into the ignition, starting the vehicle. As the vehicle started the drum began to rotate and the mechanic was crushed between the rotating drum and the frame, a completely preventable and a totally unnecessary loss of life.

Another area where stored energy could occur on a construction job site would be in an excavation. A hole is dug creating a trench (deeper than it is wide) or excavation (wider than it is deep). The side walls have the potential of stored energy. With the side walls weakened, any slight pressure on the top of the side wall can create a downward sheer force causing the side wall to collapse into the hole. If it's there by a worker in that area without proper protection, tragedy can occur. We all know that cave-in is the big issue here. The tons of dirt or material caving in around the worker can bury an employee, but it's easily preventable.

What would be the lockout/tagout for this scenario? According to the current standards, there are plenty of safeguards in place for this. The 2,2,4,4,5,6 rule of thumb comes to mind.

- The first two is placing spoil piles at least two feet from the edge of the hole. This helps keeps the shear force placed on the non-reinforced side wall of the opening to a minimum.
- The second two is that when one is digging below a trench box more than two feet, the trench box must be lowered deeper into the hole.
- Four: if the hole is four feet or greater then oxygen monitoring must be completed to maintain the allowed concentration at 21.5 percent +/- 2 percent.
- For the second four, if the hole is more than four feet, the hole needs an egress no greater than 25 feet from the worker.
- If the trench is 50 feet long, how many egress points are needed? When the hole is greater than five feet, the hole side walls need to be either shored, sloped or benched.
- And, if the hole is six feet or greater, fall protection must be used to prevent someone from falling into the hole.[3]

It is a best practice to provide barricades and signage around any opening in the ground to protect not only the worker, but

the general public from falling into an unguarded and unprotected area.

One more example of this lockout/tagout system would be around swimming pools. Whether they are commercial or private, they should be fenced and have adequate signage to warn away curious wanderers. In areas where swimming pools are very popular, it is not uncommon for the local news to highlight unnecessary drownings of individuals when these people find their way into an unguarded pool.

Within the world of electricity, the term lockout/tagout is synonymous with making sure there is no stored or residual energy in the circuit. Remember that electricity flows like water in a pipe. It is controlled by the confines of the conductor and its insulation. Should someone become part of that circuit and that person is connected to ground, then the electricity has an opportunity to escape the circuit and go to ground. Which, by the way, is its only real purpose. Perhaps, someday we will be able to communicate with electricity (science fiction, of course) and when we ask what the electrons' and protons' purpose in life is, they will undoubtedly say "to go to ground."[4]

So, when someone makes contact with a circuit and are grounded, guess where the electricity will go? That is correct, to the ground through the person. By de-energizing the circuit and locking it out, the potential of a worker coming in contact with live electricity is minimal. A standard process would be to de-energize the circuit, lock it out/tag it out, dissipate any stored or residual energy and then verify isolation with live-dead-live testing with a voltmeter.

Most electricians know that a voltmeter is a quantity measuring device that measures the amounts of volts, amps, and ohms within a circuit. When a system is unplugged or de-energized, there should be zero of all of those. Do not make the mistake of checking live-dead-live with a voltage detector. That is a quality measuring device. Is there energy in the item being tested, yes or no. The professionals in the electrical world call these devices "tic tracers" or "widow makers."

One other item to keep in mind with lockout/tagout is lock placement and removal. A person is only allowed to remove his/her lockout/tagout device, not anyone else's. Doing so places the other person in harm's way. In most companies interfering with someone else's lock is grounds for immediate termination.

In conclusion, to prevent the unexpected release of stored energy in the direction of the employee, a lockout/tagout device must be placed on systems where the stored energy is found. We all need to be reminded of the very serious and lethal ramifications should we not follow this simple rule. **OHS**

Jeffery Buckau *is a professor of occupational safety and health at Columbia Southern University.*

REFERENCES

1. *https://abcn.ws/2Zk6Gyg*
2. *www.lubbockonline.com/local-news/2016-09-02/police-man-dies-industrial-accident-involving-concrete-mixer*
3. *www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.651*
4. *https://sciencing.com/electricity-go-ground-5494279.html*

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The Fundamentals of Lab Safety

Labs are often home for some of the most dangerous hazards. Here's how employees can stay safe.

BY SYDNY SHEPARD

Following the rapid innovation, creation and distribution of a vaccine for COVID-19, there is no question that the work done in labs is important. Each day, scientists and researchers are making discoveries that improve our world and save lives. Keeping these employees safe is of the utmost importance, so understanding the fundamentals of a safe lab are critical.

To better understand how to conduct a safer lab experience for all, I asked Derek Sang Technical Training Manager at Bulwark, for the top practices to ensure protection in these environments. The topics below are just a few of Sang's top 15 fundamental practices, which we have listed in full in the sidebar below.

Safety is a Daily Duty

On the list of fundamental practices, Sang directs employees of laboratories to, "get involved in your safety program. Make safety part of your day-to-day job and encourage peers to do the same."

While this is great advice for employees in any industry, this is particularly poignant for hazardous environments where employees are potentially exposed to corrosive chemicals, irritating airborne particles or open fire as well as many other dangers. One of the riskiest behaviors an employee can find themselves exemplifying is complacency. Cutting corners, acting aloof and not following written policies and procedures can lead to dangerous circumstances for everyone involved.

To ensure that all employees feel it is part of their job to take their safety and the safety of others into their own hands. This means including workers in meetings about safety, talking frequently about the changing hazard landscape in their environment and reminding employees that their level of protection is contingent on their adherence to the policies and procedures put in place for them.

Appropriate PPE for the Job

As with many other industries, PPE is important to the safety of workers in laboratories as well. Another item on Sang's list is, "Ensure that the appropriate PPE…is on hand when you need it." There are quite a few levels of protection that should be considered when it comes to PPE in labs. Here are some of the most common types of gear you might find:

Safety Goggles: As mentioned before, labs are notorious for being home to some of the most hazardous chemicals. These can splash into the into the eyes if an employee is not careful. To mitigate this hazard, employees should look for vision protection suitable for the job, which includes safety goggles that protect not only the eyeball, but the area around the eyes from chemical splash. For a better understanding of what kind of eyewear you should be purchasing, take a look at ANSI's Z87.1 standard.

Gloves: Your hands can be your best tool, so it is important to protect them. When it comes to the hazards present in labs, it is important to choose hand protection that will keep your hands safe from absorption of chemicals, chemical burns, thermal burns, lacerations and more. Disposable nitrile or neoprene gloves are usually appropriate as protection from incidental splashes or contact with lab chemicals. However, the SDS should be consulted to verify chemical compatibility with the gloves being used.

Protective Clothing: It is important to wear protective clothing that can resist physical and chemical hazards when working in a laboratory, especially when an exposure may occur.

15 FUNDAMENTAL PRACTICES OF A SAFE LAB

1. Follow the written Environmental Health & Safety affairs (EH&S) policy statement.
2. Read your lab safety manual.
3. Organize a departmental committee of employees and management that meets regularly to discuss EH&S issues.
4. Allocate a portion of the departmental budget to safety.
5. Implement an EH&S orientation for all new employees.
6. Make learning to be healthier, safer and more environmentally friendly an integral part of your education, work and life.
7. Get involved in your safety program, make safety part of your day-to-day job and encourage your peers to do the same.
8. Be prepared for unannounced laboratory inspections.
9. Identify and correct hazardous conditions and unsafe practices.
10. Before conducting an experiment, ask yourself:
    - What are the hazards or potential hazards?
    - What regulatory standards apply to these hazards?
    - What are the prudent practices, protective facilities and personal protective equipment (PPE) necessary to minimize the risk of exposure to hazards?
11. Include health and safety considerations in every pre-experiment discussion.
12. Ensure that the appropriate PPE, such as flame-resistant or chemical-splash protective lab coat, is on hand and available when you need it.
13. Develop specific work practices for individual experiments, such as those that involve particularly hazardous materials and/or should only be conducted in a ventilated hood.
14. Don't allow experiments to run unattended unless they are failsafe.
15. Maintain an easily accessible safety library with relevant resources.

Lab coats can protect against minor chemical splashes and solid contamination, while plastic or rubber aprons are best for protection from corrosive or irritating liquids. Ensure that your protective clothing keeps you safe from all hazards, especially if employees will be working around an open flame, as flame-resistant options are available.

Foot Protection: It is important to wear closed toe shoes at all times when employees are in buildings where chemicals are being used or stored. Workers should avoid perforated shoes, sandals or cloth sneakers when in laboratories or where mechanical work is being conducted. This kind of footwear offers little protection against chemical and physical hazards.

Information is Power

You will notice on Sang's list of fundamental lab safety practice, several of them are aimed to generate more education for employees. This knowledge can give employees the basis of information that they need to go into the workplace with a confident outlook to perform their job tasks safely and effectively.

The first on the list is to, "read the lab safety manual." This cannot be stressed enough. While every lab varies their manual based on the duties performed and hazards present, there is still a lot of powerful information inside these safety manuals to arm employees with the knowledge they need to mitigate potentially dangerous situations. Safety manuals may include, but are not limited to:

- Lab safety practices
- Chemical hygiene plans
- Emergency procedures
- Health hazards of chemicals
- Electrical Safety
- Lab ventilation practices

Sang also mentions that it is important to, "maintain an easily accessible safety library with relevant resources." It is important that if employees have a question, or do not know what to do in a high stress moment, that they have a place they can go to easily and quickly pull information. The more information employees have, the better prepared they will be if the worst happens.

Lab Safety is Human Safety

It is imperative that scientists, researchers and others who might find themselves working in laboratories make safety a continuous theme in their day-to-day work, wear appropriate PPE for the job and arm themselves with as much information as possible to protect themselves.

While there are many safety practices that are important when it comes to lab safety, I do hope that you'll find Sang's list of fundamentals useful and thought provoking for the next time you step into the lab. OHS

***Sydny Shepard** is editor of* Occupational Health & Safety *magazine.*

How Lean Design Improves Efficient Use of Emergency Showers and Eyewashes

Management should uncover emergency safety shower procedures and equipment that are not doing the job sufficiently or correctly.

BY RYAN PFUND

In an emergency, every second counts. So, when the need arises to use eyewashes and emergency safety showers, eliminating any waste and inefficiency from the process can mean the difference between a good outcome and a bad outcome. Just as "lean" principles have been used to improve manufacturing efficiency, lean can be applied to almost any work application or production process, including improving the performance and efficiency of emergency safety showers.

Now that more facilities are fully reopening and full-time operations are returning to normal, it's important for safety managers to take a close look at the efficient use of emergency safety showers in their work environments, operations and processes. Are adequate quantities of safety showers and eyewashes confirmed to be in the correct placement relative to site hazards? Is the equipment tested regularly and working properly according to ANSI/ISEA Z358.1–2014 American National Standard for Emergency Eyewash and Shower Equipment?[1] Are employees fully trained on the use of safety shower equipment?

Conversely, management should uncover emergency safety shower procedures and equipment that are not doing the job sufficiently or correctly. A thorough site evaluation can identify disorganization, old bad habits and outdated equipment and systems that create waste, inefficiencies and unsanitary conditions.

Leaning into a Streamlined Emergency Response

Lean design is a process-driven approach that examines the layout, flow, processes and protocols of a worksite, focusing on identifying and eliminating problems.

According to the American Society of Mechanical Engineers (ASME): "The goal of lean is to eliminate waste—the non-value-added components in

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any process. Unless a process has gone through lean multiple times, it contains some element of waste. When done correctly, lean can create huge improvements in efficiency, cycle time, productivity, material costs and scrap, leading to lower costs and improved competitiveness. And remember, lean isn't restricted to manufacturing. It can improve how a team works together, inventory management, and even client interaction."[2]

In the case of using eyewashes and safety showers, lean design can help to streamline each process by minimizing unnecessary movement and waste, which can also offset cross-contamination. Specifically, lean can help a worksite minimize the number of steps taken to a safety fixture, eliminate the frantic search for equipment in an emergency and avoid delays in activating the flushing fluid.

Applying lean design principles, the following emergency shower eyewash and shower technologies help to conserve space, increase efficiency and improve hygiene for use in a variety of work settings which, in turn, boosts safety and performance.

Swing-activated eyewash models. For facilities such as laboratory environments and tight workspaces, a new generation eyewash model combines a sink faucet with an eyewash built in for emergency eyewash use, offering a highly efficient and convenient space-saving solution.

During regular faucet use, the eyewash is stored out of the way. In an emergency, the eyewash is immediately activated when it is swung out 90 degrees over the sink. When the eyewash is activated, the swing-activated design ensures that the faucet moves out of the way, positioning the eyewash directly over the sink and allowing clear access to the fixture. With the eyewash in the optimal position over the sink, water is contained in the sink without dripping or spraying on countertops and floors, which can create mess and the risk of slipping and falling.

Newer models are mounted lower to the deck rather than on the top of the faucet, providing more convenient and comfortable use of the emergency fixture compared with other models on the market, and reinforcing stability and durability of the fixture during use.

Dual use thermostatic mixing valves. Another new "dual use" design for thermostatic mixing valves (TMVs) models delivers safe water temperatures to commercial faucet applications and emergency safety eyewash fixtures. With two valves in one, this design saves installation time and conserves space under sinks.

During regular faucet use, the TMV delivers tempered water for uses such as handwashing; in an emergency, it delivers ANSI/ISEA-required tepid water. Again, this single source design is especially useful for cloistered work applications and laboratory settings.

Eyewash designs for increased hygiene. Especially as we move beyond the pandemic, it's important to keep eye/face wash systems clean and bacteria-free. One of the newer eye/face wash models comes equipped with a self-draining design that eliminates any settled water in the system. This model also incorporates separate supply and waste pipes to prevent cross-contamination from the clean inlet and wastewater.

Sometimes stagnant water is left over from false activations, tampering and other misuse by workers, leaving equipment vulnerable to contamination. While facility managers can avoid these issues by installing an eyewash alarm system, newer eyewash designs come equipped with either plastic or stainless-steel bowl covers that shield the entire bowl from misuse and contamination.

Some eyewash systems use a sturdy plastic see-through hinged bowl cover. The see-through plastic allows for quick and easy visual inspection and the hinging mechanism provides a more secure hold. The fixture is activated as the cover is opened and may be installed on barrier-free fixtures.

Undoubtedly, every facility has different needs and spatial requirements. Safety managers should assess the layout and processes of a given facility during operations to identify problems and customize solutions. While new technology provides many space and cost efficiencies, ultimately, workers must be trained on why the fixtures are important, where they are located and how to properly use them. Some emergency equipment manufacturers offer free job site evaluations to help identify where efficiencies can be gained, assist with product selection, ANSI/ISEA compliance and training to reinforce protection for all. **OHS**

Ryan Pfund *is Senior Product Manager, Emergency Fixtures, for Bradley Corporation of Menomonee Falls, Wisconsin.*

REFERENCES

1. *https://store.assp.org/PersonifyEbusiness/Store/Product-Details/productId/13594147*
2. *https://www.asme.org/topics-resources/content/5-lean-principles-every-should-know*

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Facility Managers Play a Pivotal Role in Safely Building, Renovating and Demolishing Structures

It's important to understand the factors that most frequently contribute to construction site fires so that needed steps to minimize associated risks can be taken.

BY VAL ZIAVRAS


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Hardly a week goes by without a building under a construction fire shows up on our news feeds. In recent months, we have witnessed fires in commercial buildings being renovated[1] in Idaho, in a former Sony building in New Jersey being demolished[2] and in multiple apartment buildings being developed around the country, including high profile incidents in Las Vegas[3] and Texas.[4]

Data[5] shows that fires in buildings under construction occur all too frequently. Fires broke out in U.S. buildings under construction during the years 2013-2017, on average, every 90 minutes. These blazes caused an average of four civilian deaths, 49 injuries and $304 million in direct property damage annually. Most occurred in residential properties, but seven percent of the fires took place in (large and small) mercantile or business properties.

Facility managers may not be directly responsible for overseeing new building development or demolition projects, but they certainly play a significant role when existing structures are being renovated. Those charged with the care and maintenance of buildings can also foster a culture of safety among workers, whether a structure is being built, rehabbed or razed.

Understand the Leading Risks

It's important to understand the factors that most frequently contribute to construction site fires so that needed steps to minimize associated risks can be taken.

NFPA research shows that during 2016 and 2017, there was a sizable increase in renovation fires, with 2017 having the second-highest number of incidents in the last decade. Fire departments responded to an average of 2,580 fires in structures undergoing major renovations annually from 2013-2017. These fires made up only one percent of all reported structure fires but still caused an average of eight deaths, 52 injuries and $104 million in direct property each year. While large fires typically make the news, many of the major renovation fires (almost one-fifth) were confined fires.

Electrical distribution and lighting equipment were the leading cause of these fires and resulted in three in 10 injuries. The data tells us that 15 percent of fires were caused by heating equipment and accounted for 21 percent of injuries. Arcing was the leading heat source in renovation fires, followed by a spark, ember or flame from operating equipment, radiated or conducted heat from operating equipment and unclassified heat from powered equipment.

Fires that were intentionally set caused 12 percent of fires, while one in 10 fires were caused by cooking equipment. Torches, burners or soldering irons prompted one in 10 fires and more than one fifth of direct property damage while smoking materials started three percent of fires and caused eight percent of injuries.

December and January saw the most fires (although things peaked in March), and civilian injuries were highest in January and February. Renovation fires typically occur between noon and four p.m. (21 percent of total) and between four p.m. and eight p.m. (22 percent of total) but those that occurred between midnight and four a.m. caused disproportionate shares of direct property damage. A structural member or framing is typically the first item ignited in structures being altered.

Develop a Fire Safety Program

Whether a building onsite is being constructed, renovated or demolished, facility managers should understand and agree with the fire safety strategies that will be in place during construction. NFPA® 241 Standard for Safeguarding Construction, Alteration and Demolition Operations[6] has been in existence since 1933 to help facility managers and others mitigate fire risks during construction projects. NFPA 241 is a comprehensive document that requires a building owner to develop a fire prevention program for every construction project. The owner then designates a Fire Prevention Program Manager (FPPM) who is responsible for carrying out and enforcing the site's fire prevention program.

Emphasizing a holistic approach to safety is always wise but especially so during any element of construction. Facility managers should be in lockstep with the designated FPPM—meeting regularly with that individual and visiting the site often to ensure that safety messages are communicated, protocols are followed and steps are being taken to ensure that fire risk is minimized.

One of the best ways that facility managers can advance safety

during alteration or demolition that may be outside of their direct purview is by fostering a safety culture onsite. Taking the time to talk to the FPPM and workers about housekeeping practices, hot work permit systems, fire protection impairment permit systems and construction site security can help reduce the likelihood of a construction catastrophe.

Good Housekeeping

Fires start when there is an ignition source, oxygen and fuel so it is critical to decrease fuel and ignition sources on construction sites by adopting sound housekeeping practices. The following steps won't eliminate fire risk entirely, but they will prevent a fire from growing if one does start:

- Ensure that workers are taking proactive steps to properly store combustible materials, empty the garbage regularly and relentlessly remove onsite debris.
- Combustible materials, such as cardboard boxes or the construction materials themselves (wood) are prevalent on construction sites so it is important that these materials are stored at a safe distance from any potential ignition sources, such as temporary heating equipment.
- Dumpsters and trash collection areas often contain combustible materials. Ensure these receptacles are emptied regularly so potential fuel load is eliminated or at least lowered.
- Require workers to clean up construction materials at the end of their shift or before moving on to another aspect of the job.
- Hold workers accountable for removing food and drink materials to minimize fuel sources.

Hot Work and Fire Protection Permitting Systems

Welding, soldering, grinding, cutting and brazing are all forms of hot work[7] that can potentially create an ignition source on a job site. By establishing a hot work permit system, facility managers will ensure that consideration has been given to the surrounding environment where the hot work is taking place. Moving combustibles, such as packaging materials, a safe distance from the hot work site, implementing safeguards to minimize the risk of sparks falling to floors below via floor openings, and determining if a fire watch are all necessary efforts that may not eliminate the risks associated with hot work on construction sites, but they will minimize them.

Similarly, establish a fire protection impairment permit system to reduce potential risks to systems. A permit system helps the FPPM manage what portions of required systems are shut down or temporarily impaired. It details protocols for ensuring that two systems on the same floor are not impaired at the same time or that two consecutive floors are not impaired at the same time. A two-permit system can also prevent hot work from being authorized in an area where a fire protection system has been impaired. By limiting areas of a building that are in a vulnerable state and managing the type of work being conducted in that area, a facility manager working in tandem with an FPPM can strengthen construction site safety.

Site Security for Safety

As previously noted, intentionally set fires are one of the leading causes of fire in buildings undergoing construction and major renovation. Secure sites with fencing or by requiring guard service in the hours when work is not conducted so that unwanted visitors are thwarted from accessing the construction site. Ensure that the project is adequately lit and that video surveillance is in place to prevent unauthorized people from entering the premises. During work hours, make sure workers are using designated access routes and not creating shortcuts so that unapproved parties are not entering areas and potentially setting fires or vandalizing.

Construction Safety Solutions

NFPA recently conducted a popular webinar[8] on the topic of construction fire safety that included a robust discussion of related issues and opportunities. The association also created a one-hour Construction Site Fire Safety Fundamentals Online Training[9] that offers tips on identifying everyday onsite fire hazards and ways to deal with them. A new five-part online Fire Prevention Program Manager Online Training Series[10] is designed to help professionals that are new to maintaining fire safety on construction sites improve their understanding of FPPM job roles and responsibilities.

"People need to understand that the requirements outlined in NFPA 241 are there for good reason," Dave Chandler, vice president of environmental health, safety, and quality at Maryland-based Davis Construction recently told NFPA Journal.[11] Chandler went on to say, "Investing properly in safety minimizes the risk of catastrophes and loss of life. It takes a really proactive approach at minimizing the risk, and any construction, alteration, or demolition has that ever-present risk of fire."[12] OHS

Valerie Ziavras *is an engineer in the NFPA technical services division.*

REFERENCES

1. *https://www.ktvb.com/article/news/local/fast-burning-fire-consumes-office-building-in-downtown-hailey/277-c86c4989-e6c2-4148-8789-c71378a693a3*
2. *https://dailyvoice.com/new-jersey/pascackvalley/news/fire-breaks-out-as-workers-demolish-former-sony-building-in-park-ridge/804981/*
3. *https://www.firehouse.com/operations-training/video/21206617/nearly-90-firefighters-battle-fire-at-nv-apartments-under-construction*
4. *https://www.khou.com/article/news/local/fire-katy-burning-apartment/285-70b9b75b-9dd0-498f-984c-e68dbd0f1c21*
5. *https://www.nfpa.org/constructionfires*
6. *https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=241*
7. *https://www.nfpa.org/Training-and-Events/By-topic/Hot-Work*
8. *https://www.nfpa.org/News-and-Research/Publications-and-media/Blogs-Landing-Page/NFPA-Today/Blog-Posts/2021/06/09/Four-key-recommendations-can-help-significantly-reduce-the-risk-of-construction-site-fires*
9. *https://catalog.nfpa.org/Construction-Site-Fire-Safety-Fundamentals-Online-Training-P21527.aspx?icid=W370*
10. *https://catalog.nfpa.org/building-safety-fundamentals-C4083.aspx?utm_source=dmps&utm_medium=print&utm_campaign=dmps0123&utm_content=xcat&order_src=p093&utm_source=tprt&utm_medium=ads&utm_campaign=tprt0275&utm_content=mtpl&order_src=v235*
11. *https://www.nfpa.org/News-and-Research/Publications-and-media/NFPA-Journal/2021/Summer-2021/Features/Safety-First*
12. *https://go.nfpa.org/l/14662/2021-04-13/8hg5ql*

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An Agile Framework for Occupational Health Mitigation

Occupational hazards require continuous assessment and evaluation to ensure the sustainment of zero hazard occurrences.

BY SASO KRSTOVSKI

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Occupational health is a critical aspect of any industry. Organizations understand the impact and significance of the elimination of any hazards for the workforce. Occupational hazards require continuous assessment and evaluation to ensure the sustainment of zero hazard occurrences. The first step is a categorization of the occupational hazard. Two categorical approaches for hazard mitigation are reactive and proactive. Reactive is a result of an incident occurrence. Proactive is driven based on indicators signaling potential and preventive measures that are developed to mitigate future failures. A severity assessment guides solution strategy based on process, design or blended actions. The final phase in the framework requires a thorough evaluation of potential replication in other areas within the organization.

Hazard Categorization

Concern resolution is categorized as reactive or proactive. Reactive is after the fact requiring the team to work backward from the actual incident to understand the root cause. Proactive requires anticipation of concern potential. A visionary approach challenges teams to think differently at potential hazards. Both approaches are vital for occupational health management.

Reactive Approach. A reactive approach is critical in the management of hazard incidents. Every incident requires immediate remediation to prevent further incidents. Based on the severity of hazard mitigation, efforts range from process changes to complete redesign of the process. The natural human instinct for reactive measurements drives quick actions. This drives concentrated effort on particular concerns and prevents a holistic view of the complete system. These actions could impose additional risks in the process. Occupation health mitigation efforts for reactive concerns

Proactive Approach. Proactive approaches are derived from the three "R"s reports, recognition and replication.

Reporting encompasses teams analyzing current data collection methods for hazard activities. The process requires significant efforts to not only research data but also confirm accuracy and consistency in reporting. A structured approach utilizing PDCA or six sigma DMAIC problem-solving methodology is necessary to facilitate hazard concern identification and resolution. Pareto analysis of the highest functional area, procedural task or hazard condition is the first step in determining focus efforts. Recognition requires having an "eye for safety." Hazard conditions are observed during regular activity. Recognizing hazards afford teams to formulate a temporary mitigation plan and focus on a robust permanent corrective action. This mechanism requires individuals to train themselves to have an "eye for safety." Individuals assess every potential scene on how activities or tasks can generate a hazard condition. Enhancement of sensory skills and innovative thinking mindset is vital to discover potential concerns based on the current state. This requires a unique personal ability and requires continuous out of the box thinking.

Replication involves finding best practices implemented elsewhere and incorporating them internally. Research and assessment have already been conducted; therefore, implementation effort is minimal. This is analogous to "low hanging fruit." The effort to pick low fruit is significantly less than ones higher in the tree. This proactive approach is greatly overlooked. Implementation is simple to perform and value is significant. Organizations lack prioritization of this proactive approach.

Replication vetting is critical after any hazard mitigation effort. Every solution strategy implemented reactive or proactive must be assess for replication internally or externally. The step-in hazard mitigation is critical to achieve avoidance and sustainment.

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Hazard Severity

Assessment of hazard severity level formulates the resolution strategy type. The severity level is determined based on frequency, probability and hazard type. Figure 1 displays the criteria for the classification of each level.

Figure 1: Classification Levels

Frequency	Occurrence	Probability	Occurrence	Hazard	Condition
Low	> 1/week	Low	< 25%	Low	< Minor Injury
Medium	1/day	Medium	26% - 50%	Medium	Medical Treatment
High	< 1/hour	High	> 51%	High	> Amputation

Table I shows a matrix for severity level determination. High severity hazards require complex robust solutions. Low severity can be managed and controlled with minor modification to process or task. All occupation hazards must be addressed with solutions strategies that eliminate concern and ensure no additional compromises are generated in process or task.

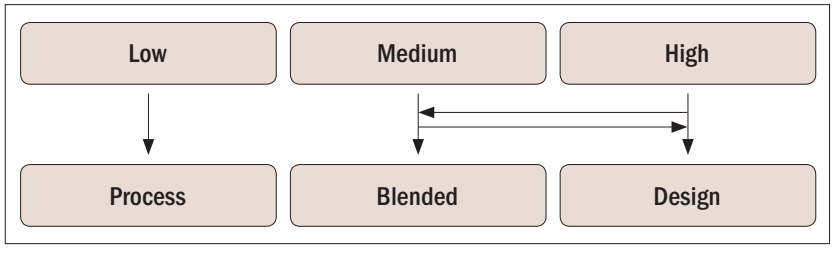
Table I: Severity Matrix

Severity	Frequency	Probability	Hazard
High	Any	Any	High
Medium	Any	High	Low
Low	Low	Low	Low

Solution Strategy

Hazard severity level outlines solution strategy type. Figure 2 shows the roadmap for resolution strategy based on hazard level rating. This roadmap outlines a recommendation of a strategy that provides the most significant potential for a robust solution. Low severity levels require modification in the current process to eliminate hazard condition. Hazard levels of medium and high need a design or blended approach to resolving.

Figure 2: Solution Strategy Based on Severity Rating



Design requires a thorough review of the process or task. Analysis centers on designing out the hazard. Solutions generated require a philosophical change. Process changes are structural and implemented relatively quickly. A blended approach involves modification of design and changes within the process or task to accomplish the requirement.

Scenario Investigation

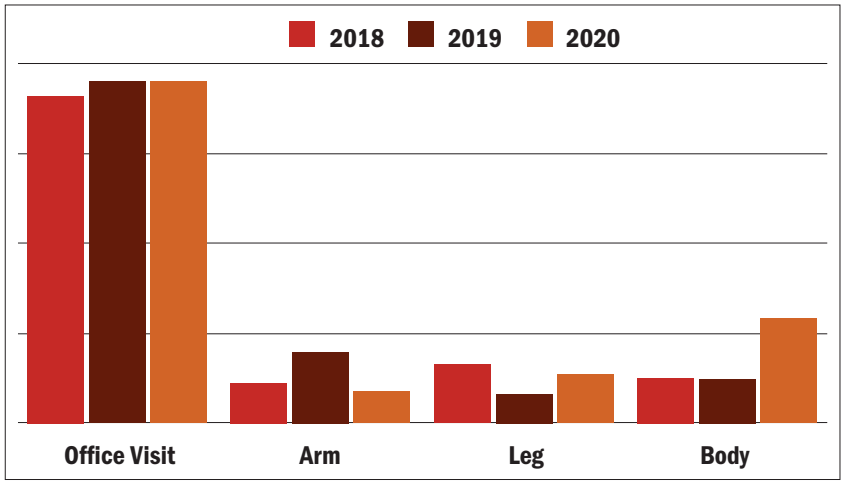
Engaging the above framework for a typical occupational hazard condition highlights the process roadmap and tollgate outcomes to support agile solution strategy. Any categorical hazard condition assessment can embrace the framework. A consistent hazard challenge for the majority of industries is slip and trip. This occupational safety concern is a constant metric impacting top priority concerns for safety professions.

Reactive. On any particular day, an employee or customer can encounter a slip within the organization's facility. A report is submitted and immediately the safety team responds. The first action requires activities to isolate any additional cases. Next, teams review and determine the impact of severity. This would be a LOW impact and requires modification to the process. Performing a traditional 5-Whys for root cause determination is a leaking water cooler. Actions implemented a preventive maintenance schedule for water cooler assessment at a particular frequency to ensure no leaks.

Proactive. Proactive activities are desired for any concern. Proactive actions allow to prevent occurrences and afford the team more time to diagnose and develop a robust solution. There are three Key Process Input (KPI) for uncovering hazard condition proactively: reporting, recognition and replication. Each avenue contributes equally to the successful mitigation of potential hazard conditions.

- **Reporting.** Reporting involves a review of current data collected based on incidents. Teams review and uncover critical areas, operations or tasks to address based on historical analysis. Figure 3 displays a year-by-year hazard metric data for a manufacturing location. Visual office visits, arm and leg occurrences are not statistically different. Body metric indicates a dramatic shift in 2020. The team needs to further dissect data for body metrics and understand indicators driving higher incidents.
- **Recognition.** Recognition is an act of discovering potential hazards during daily activities. A health and safety-conscious employee walking during lunch notice an abnormal floor surface. Escalating concern to facilities department it was discovered a slow leak from above piping. Quickly area was quarantined off to prevent access. Piping was repaired. Further, a periodic schedule was implemented to assess all potential piping under walking surfaces.
- **Replication.** Replication is a concept of implementation of solutions from other departments or organizations. A safety professional receives an email from a colleague about a concern involving a trip hazard. An employee tripped over a hose from a hydraulic truck laying across a walkway to tap off the fluid in a piece

Figure 3: Yearly Safety Metrics



of equipment. The team discovered this was a one-off condition and the process is used throughout their facility. During problem-solving, the team uncovered the hose blended with the flooring and it wasn't easy to see. Seeking a low cost-effective solution, the team decided to modify the hose used in the hydraulic truck to a florescent color to increase visibility. After reviewing the solution, the strategy safety profession assessment facility discovered a location that has significant usage of hoses for equipment repairs. Leveraging knowledge from other facilities, the team replicated a similar approach to the minimized potential for trips.

Conclusion

This publication outlines an agile framework to mitigate the occupational hazard. Following the roadmap supports quick, robust solutions to concerns. Both approaches reactive and proactive are necessary to ensure safety in the workforce. Organizations need to increase resources to focus on proactive methodologies to minimized reactive activities. Occupational hazards require continuous assessment and evaluation to ensure the sustainment of zero hazard occurrences. OHS

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Communication Insights for Supervision and Safety

Communication is key when it comes to success in the workplace.

BY PETER FURST

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The supervisor, effectively, serves as the link between management and the workforce by virtue of the fact that they ensure management's goals and objective are realized though the workforce's efforts and accomplishments. To perform successfully, the supervisor must be able to effectively communicate with the workforce. Educating supervisors on effective communication skills will enable workforce performance and enhance organizational goal attainment. This to some extent applies to the safety manager as well.

Speech and language are foundational to people communicating thoughts, needs, wants, etc. For most people, effective communication means a proficient use of language. Both parties must have a common language and similar understanding for communication to be effective. It is generally better to use familiar words in place of the unfamiliar ones, concrete words in place of the abstract ones, short words in place of long ones and single words in place of several.

Interpersonal Communication

Communication starts with one person (transmitter) having a thought or information which they want to transmit it to another (receiver). The thoughts have to be put into words (encoding) prior to transmission. The receiver then has to decode the message and make sense of it. Encoding as well as decoding are influenced by the cognition, emotions, perception, attitude of each party, their relationship as well as the context and/or situation. To overcome some of these barriers, the transmitter must consider the receiver's outlook and circumstance to have a successful exchange.

The communication process has many facets. There are a number of elements which influence the selection of words with which to convey the message. How that other person receives the message can be affected by the receiver's perception, emotional state, listening skills, life experience, etc.; therefore, the sender should be attuned to this.

There are also many communication channels which can affect the message. Selecting the appropriate channel for the situation will also impact the quality of the exchange. On a construction site, much of the communication is generally done verbally, and so the environment where the exchange occurs may and more than likely will impact the quality of the exchange.

Nonverbal Communication

People have engaged in nonverbal communication long before they used language. Nonverbal communication primarily occurs below our conscious awareness level. Generally, all messages communicated orally and, to some extent, the ones in writing have a nonverbal component, which can reinforce, complement, interfere or contradict the intended message. We may express something verbally while our facial expressions, tone of voice, or gestures may indicate something different or even the opposite.

Nonverbal communication may communicate beliefs, attitude, or other emotions related to the message, or possibly the speakers state of mind, reflect the relationship between the parties. Therefore, any of the nonverbal cues can play an important role in either facilitating or hindering effective communication, or conversely it can provide valuable information about the thinking of the people involved in the exchange.

The supervisor or safety manager may not appreciate the importance of nonverbal communication, its effect on dealing with people, effectively resolving work-related issues, and, more importantly enhancing understanding. This could render these people less than optimally effective, and impacting the effectiveness of the workforce, the efficiency of operations, and profitability of the organization. Research has shown that about seven percent of information is communicated by words, 38 percent by vocal tone, and 55 percent by body language.

The differences in values, beliefs and personalities between supervision and the workforce will affect the way each person hears, interprets and reacts to the same information. Therefore, being aware of this and taking it into consideration will greatly improve the exchange. Another important factor the supervisor should be looking for is nonverbal reaction or feedback from the workforce, which will allow for adjusting so that the message is received as intended and understood by the receiver.

It is important to note that, in positive interactions, less

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attention is paid to the tone of voice or nonverbal component of the interaction as on what is being said and how the message makes us feel. When the exchange is negative, emotionally charged or confrontational, the focus gravitates to the nonverbal part of the interaction and tone of voice taking on a significant role in how we react to the message.

The Effect of Nonverbal Cues on Communication

Facial expressions play a significant role in communication, as they convey the emotional state of an individual to an observer. The eyes especially are viewed as important features of facial expressions. Such things as blinking rate can be used to assess whether or not a person is nervous or may be lying. Eye contact is considered an important aspect of interpersonal communication. These beliefs may differ in different cultures.

Posture also plays a role in nonverbal communication. Certain postures such as crossed legs or folded arms may signal defensiveness, while an open posture may portray friendliness. Leaning toward a speaker signals interest in what is being said. Mirroring (copying the other person's posture) helps to subtly develop a connection with another person. Paying attention to posture will improve communication.

Gestures such as hand, head or body movement can express or emphasize an idea or emotion. Research has found that when gestures and words are aligned, the message is more effective, but when they are not aligned, they tend to confuse the listener and detract from the message. Gestures also heighten the interest of the listeners and add value to communication.

Tone of Voice's Effect on Communication

Tone pertains to pitch, volume, pace and emphasis used in delivering a message. Pitch of voice (intensity, degree of high and low) and its timing also play a role in the quality of the communication. When tone is varied, life and energy are injected into the message. Tone of voice conveys emotions like excitement, enthusiasm and humor. Our tone conveys our attitude, whether we send a message of humor, anger, sarcasm, jealousy or sincerity.

Research indicates that people make instinctive judgment of others based upon the tone of voice used. People instinctively respond positively or negatively to tone of voice. Tone might actually be more important than what is literally being said. The same sentence can have different meaning depending on which word is emphasized and the tone of voice used. A common complaint about upsetting messages is that, though the delivered message may not seem offensive, the tone of voice used in the statement was hurtful and impacted the result. Also, any statement that may seem neutral on paper can become very offensive if spoken with a sarcastic or demeaning tone of voice.

Speaking slower has a number of positive effects on communication. It is important to slow down when giving advice,

coaching or providing constructive criticism. The implication also is that you are weighing the evidence and considering your message. So, the person who pauses and speaks at a slower pace tends to be perceived as more intelligent, thoughtful and deliberate. His or her message carries more weight and tends to garner greater acceptance.

Here's a few effective verbal communication strategies:

- Create an open work environment to foster good working relationships. Exhibit undivided attention to the people with whom you are conversing. Avoid trying to communicate in busy and noisy places.
- Focus on the issue, not people. Avoid taking things personally. Try to resolve issues amicably. Express needs and/or opinions in terms of the work at hand. Constructive criticism should be directed at the work and not the worker's personality.
- How one feels toward people will easily manifest itself in one's demeanor and will readily be picked up by them. When dealing with people, it is important to demonstrate sensitivity.
- Demonstrate flexibility when dealing with others. Respond in ways that acknowledge their knowledge and experience. Treat people fairly and with respect. Thank them for their input.
- Good listening skills and showing a genuine interest are attributes of a successful communicator. Actively listening to people creates an atmosphere of trust and respect, enhancing communication.
- Be concise, use clear language, listen for feedback and pay attention to body language and tone of voice.

Conclusion

We become better communicators when we devise messages that elicit the response we expect or desire from recipients. To accomplish this effectively, we need to thoroughly understand the communication process and its inherent barriers. If we do not elicit the anticipated response, we need to be able to modify the message to facilitate its understanding. We also need to be able to recognize the effect our messages can have on the recipient and how to structure them so the effect is as positive as possible. To communicate effectively, we also need to actively seek out feedback as well as build relationships so as to enhance the overall communication process.

Communication skills are critical in everything we do. How well we communicate and how effective our communication determines, to a great extent, how successful we are in our professional or personal lives. The ability to convey knowledge is power. What we think or know only becomes powerful if we can pass it along to others so that they may use it to better their circumstances or those of their organization. OHS

Peter G. Furst *is the president of The Furst Group which is an Organizational & Human Performance Consultancy.*

FIT TESTING SOFTWARE

VelocityEHS announces the launch of its new Respirator Fit Testing (RFT) software, which helps companies safeguard workers and ensure compliance with respiratory protection standards during the global COVID-19 pandemic and beyond. The new RFT software directly meets this need by standardizing the scheduling, documentation and follow up for all RFT activities through a single, easy-to-use software platform.

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CIRCLE 301 ON CARD

FOOT PROTECTION

KEEN Utility introduces its Women's San Jose workboot. KEEN Utility made the classic wedge silhouette modern with some performance, comfort and safety features including: KEEN Luftcell air-infused cushioning and a slip-resistant outsole which disperses liquids underfoot quickly for better surface area contact and asymmetrical aluminum toes offering a more unobtrusive fit that are 35 percent lighter than steel.

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CIRCLE 302 ON CARD

SAFETY STATION

HEMCO announces its Safety Station: a multi-purpose drench shower, eye/face wash and safety supply storage cabinet all in one. It is ideal for laboratories where people may be exposed to potentially hazardous chemicals. Sanitary white polypro construction means there is no wood or metal to rot or rust. The Safety Station is equipped with a pull rod activated shower and push handle eye/face wash for quick rinsing of eyes, face and body. First aid supplies can be stored in below cabinet.

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CIRCLE 303 ON CARD

SAFETY PLATFORM

Cority releases CorityOne, a 360-degree picture of risk, empowering EHS professionals to understand the hazards employees face and how physical assets can impact people and workplaces. In doing so, CorityOne provides the right worker with the right information at the right time to make quick and effective decisions. The platform empowers a future where the inputs to assess these risks will increasingly come not only from workers, but also sensors, wearables and other forms of IoT and connected devices. It features environmental, health, safety, quality and analytics clouds.

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CIRCLE 304 ON CARD

HEAD PROTECTION

Guardhat announces HC1.1: the first certified intrinsically safe smart hardhat. The HC1.1 brings Guardhat pioneering, and end-to-end connected safety solutions to workers in even the most challenging environments. The hardhat gives sensor-based contextual awareness of surroundings, multi-modal, high-precision real-time positioning (RTLS, proximity detection, comprehensive audio-visual telecommunications, peripheral connectivity and multiple wireless backhaul options with an ergonomic and user-friendly interface.

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CIRCLE 305 ON CARD

CUT RESISTANT HAND PROTECTION

Tillman introduces its 1477 Glove with cut, abrasion and puncture resistance. Tillman's 1477 is a TrueFit design and the ultimate in handling and performance gloves. Tillman TrueFit gloves are slightly undersized to deliver a "true fit" on your hand. TrueFit gloves offer the perfect combination of comfort and protection. The 1477 combines top-grain goatskin on the palm and fingers with a breathable, safety yellow spandex, keeping hands cool and comfortable. On the palm, there's a rough-side out, double goatskin layer, for a great grip, while protecting high-stress areas of the hand.

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CIRCLE 306 ON CARD

PALM PROTECTION

Brass Knuckle announces its Brass Knuckle SmartShell is the next-generation, cross-functional glove that does it all. It's loaded with features that are engineered to provide protection on multiple fronts, all while excellent flexibility and top-rated ergonomic design make it one of the most wearable gloves in its class. The winning formula for SmartShell BKCR4499 gloves starts with a machine knit, ultra-high-molecular-weight polyethylene (UHMWPE) with ANSI cut level A5 protection on the palms. Its strength-to-weight ratio is 8 to 15 times higher than steel.

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CIRCLE 307 ON CARD

HIGH FLOW PUMP

Casella has launched the Vortex3, the most innovative high flow pump on the market, designed to simplify asbestos and air sampling. Continuing to fulfil its mission to improve health in the workplace and community with life-changing monitoring technology, the high flow pump offers a flow accuracy better than +/-5 percent, ensuring consultants, contractors and specialists have confidence in results. Using Casella's patent-pending, interlocking design, the Vortex3 has an ergonomically comfortable handle and weighs just 4.8 pounds, allowing users to carry multiple units in one hand with ease.

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FOOT PROTECTION

KEEN Utility introduces the Troy work boot, featuring KEEN.BELLOWS FLEX technology, the ergonomically engineered system designed to offer multidirectional flexion where you need it most. The Troy makes bending, crawling, squatting, kneeling and other knee-down work up to three times easier. Combining quality with performance and comfort, the Troy features a KEEN.DRY waterproof, breathable membrane.

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CIRCLE 309 ON CARD

FLEXIBLE HAND PROTECTION

Magid introduces its T-REX Windstorm Series. It enhances airflow by up to 60 percent for faster heat dissipation than other impact gloves. The M-Flex Defense System features more than one hundred integrated flex points for ultra-flexible impact protection. Available with a CoolMesh Venting System back for supreme airflow or a Hyperon back for 360 degree cut protection that breathes. Get a FREE pair at magidglove.com/windstorm-series-ohs!

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CIRCLE 310 ON CARD

TOOL LANYARDS

Ergodyne announced the addition of three new site-specific Squids tool lanyards. With two new burn plus cut-resistant aramid models and a bulk pack-ready low-profile carabiner model, this launch continues to build out the Squids line with even more ANSI 121-approved tethering solutions for preventing dangerous drops. The burn + cut-resistant lanyards are ideal for situations where flames and sparks are a risk, including electrical, line work and welding.

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CIRCLE 311 ON CARD

FIRST AID KITS

Milwaukee Tool is once again adding to their PACKOUT Modular Storage System with two new PACKOUT First Aid Kits—a 204-piece Class B Type III Kit and a 76-piece Class A Type III Kit. Both kits are packed with first aid essentials tailored to the most common injuries users encounter on the jobsite. These new PACKOUT First Aid Kits feature an impact resistant body that keeps contents safe from drops and bumps on the jobsite. IP65-rated weather seals protect bandages, adhesives, antibiotics and other essential medical supplies from rain and other jobsite debris.

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CIRCLE 312 ON CARD

EMERGENCY SHOWER

HEMCO announces its new Drench Shower. It is equipped with a pull rod activated shower and push handle eye/face wash for immediately drenching of personnel that have been exposed to hazardous chemicals. The Shower provides a continuous stream of non-injurious water for 15 minutes or longer after activation. Combination shower and eye/face wash shall deliver 30 GPM of flowing pressure from the shower head and 8.0 GPM of flowing pressure from the eye/face wash. Drench Shower is compliant with ANSI and OSHA requirements. *www.ohsonline.com/productinfo*

CIRCLE 313 ON CARD

FOOT PROTECTION

Red Wing Shoe Company understands the needs of today's and tomorrow's workers are changing. As a result, the company has introduced EXOS Lite, the lightest work boot in Red Wing's history. Created from Red Wing's industry insights and expectations for lightweight and comfortable safety footwear, the EXOS Lite line delivers on those needs without sacrificing the safety performance and craftsmanship expected from Red Wing Shoe Company. HYTEST-exclusive Terrapin internal met-guard technology.

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CIRCLE 314 ON CARD

FR/AR APPAREL APP

Westex announces the launch of "The Westex App"—available now in the App Store and Google Play. The new tool helps users select the right FR/AR apparel by matching the specific safety standards they are required to comply with, hazards they face and product attributes they're looking for to Westex products. It was developed to provide users a way to custom build an FR/AR uniform based on their workforce's individual safety standard requirements. The free mobile app is available for iOS and Android mobile devices.

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CIRCLE 315 ON CARD

FOOT PROTECTION

REEBOK introduces its Flexagon 3.0 Work, evolving from the popular Flexagon 3.0 fitness athletic package by Reebok, supremely flexes between extreme comfort and motion performance at the jobsite. Its amazing comfort properties such as its origami-inspired EVA foam midsole, Memorytech memory foam cushion footbed and nylon and mesh super breathable upper, allow for intense shock absorption and serious cushion. Not to be outdone by comfort, flex grooves on the outsole and rubber heel and toe pads offer ultimate traction and flexibility of movement and motion on any surface.

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CIRCLE 316 ON CARD

LOADING DOCK SEAL

RITEHITE releases The PitMaster II Under-leveler Seal. It helps facilities save energy and keep contaminants out by providing a seal at the "fourth side" of the loading dock opening. Utilizing a main sealing curtain, side seals and filler panels, the PitMaster II seal helps maintain facility cleanliness and improve energy efficiency at the loading dock. The PitMaster II incorporates new design elements that complement a greater array of dock leveler types and styles and makes it easier to install and maintain.

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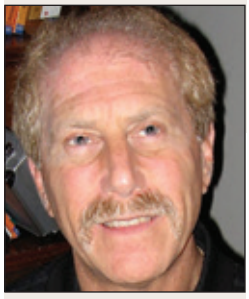
CIRCLE 317 ON CARD

Leadership Mindset

High-level leadership has always been a heightened challenge, even more so during these times.



I believe leadership begins with mindset, the stabilizing presence of a reassuring, calm and strategic approach for traversing through hard times.

Have you ever felt irritated when something went wrong? You've gotten so used to smooth functioning only to resent when things unexpectedly tilt out of whack? As John Lennon lyricized, "Life is what happens to you when you're busy making other plans."

So many of us now find ourselves without any sense of what "normal" means. We are living in an upside-down, hyper-uncertain universe where trust in established institutions is increasingly suspect, and few can agree on the same set of "facts." Connections between many have become overstretched, and critical positions are now difficult to fill—all while safety and health issues and concerns have sharply zoomed to a forefront. There's obviously no business as usual.

High-level leadership has always been a heightened challenge; even more so during these times. It's similar to trying to remain stable on a wobbly skateboard as the terrain shifts, the ground tremors and atmosphere sharply oscillates, all while often bottoming out in unexpected potholes on a course where you can't see past the next looming curve. So, how can we as leaders best contribute to helping ourselves and others remain safe at work and home and operating as aware and connected team members?

I believe leadership begins with mindset, the stabilizing presence of a reassuring, calm and strategic approach for traversing through hard times. Because mindset is such a critical leadership tool for directing perceptions than spurring decisions and actions, it's essential that leaders periodically realign their own mindset—just as you would realign your car's front end after lurching through a patch of rough unpaved road. Further, if we as leaders don't enhance our own mindset, how can we reasonably expect to help others upgrade their safety beliefs and actions?

Unless strategically renewed, clinging onto a mindset that no longer fits is like trying to steer through a driving storm wearing old glasses that only normalized eyesight decades ago. It's ineffective and dangerous.

Mindset realignment enables mindfully refocusing on currently surfacing present concerns and mastering change agentry (beliefs, decisions and skills.) In practice, it's critical for actually reducing longstanding/persistent injuries that "old ways" have only helped to a point.

One of my personal mindset recalibrations has been embracing that all leaders are ultimately problem-solvers and are not relied on as much when things run smoothly, safely and without incident. Leaders are most valuable when things go astray but can also be a critical part of the team when it comes time to foresee and head off potential threats and other obstacles. In the sense that a major emphasis in safety is perceiving, avoiding and reducing risk while balancing opportunities. In essence, all leaders, no matter their title, level or focus, are safety leaders.

Pre-pandemic, I was speaking with the Safety Director of an East Coast utility who spoke with a high degree of frustration that he had been expending an exorbitant number of resources on a specific approach to reducing ongoing significant soft-tissue injuries—but seeing zero improvement.

You've likely heard the expression that the definition of insanity is doing the same things over and over while expecting different results? Here, in a similar vein, is Will Rogers' admonition: "The secret of success is simple; when you're in a hole, quit digging."

Sounds obvious, but I've frequently seen some leaders become so desperate for solutions, they call out for an even bigger, more powerful shovel. In other words, they double down on more of the same. If workers ignore safety signs, post more of them. If they don't listen, tell them again, only louder and with threats. If they don't follow policies and procedures, write even more with extra details to remember.

Sometimes it doesn't work and often just backfires. Sometimes it's a significant change or "upheaval" for many that can be recast as an opportunity to re-examine and recalibrate an organizational leadership mindset. This means trying new methods or revisiting old approaches in new ways. Here are some questions to consider:

- What are the safety issues we've been "battling" forever?
- What assumptions underlie the ways we've been reflexively approaching our ongoing problems?
- Why do these same nagging injuries continue to harm?
- If we're not making real progress, seeing true improvement—and haven't been for quite some time—why are we persisting in doing the same-old "solutions"?
- What are the cultural and other pressures, inside or out, that we've allowed to lock us down?
- Are we promoting and/or hiring the same types of people who may fit in but don't further our safety culture? Why?
- Why do we tolerate some leaders being safety opposers—and what might we do about it?
- What do we assume make our people tick? Have their previous motivations changed mid- or post-pandemic?
- How does a dramatically-increased awareness of safety and health (it now seems everyone now knows what "PPE" means) impact our approach to safety messaging, training, coaching, investigating, programming, etc.?

I've consistently seen that the best leaders persistently self-monitor and self-adjust. They know that significantly changed conditions and environments necessitate new approaches. Therefore, these can only be generated by leaders having the courage, open-mindedness and skill to first examine and realign their own mindsets. OHS

***Robert Pater** is Managing Director of SSA/MoveSMART®.*

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62	National Association of Safety Professionals	79	www.naspweb.com
44	National Fire Protection Association	3	www.nfpa.org/blssolutions
61	National Fire Protection Association	33	www.nfpa.org/ihsolutions
27	National Safety Apparel	7	www.thinkNSA.com/arcflash-revolution
45	National Safety Apparel	65	www.thinkNSA.com
46	National Safety Council	85	www.nsc.org/OHS
8	New Pig	11	www.newpig.com
	OH&S Online	89	www.ohsonline.com
	OH&S SafetyPod	90	www.ohsonline.com/safetypod
19	OLFA USA, Inc.	77	www.olfahandtools.com
9	OLFA USA, Inc.	77	www.olfa.com/OHS
63	OraSure Technologies	62	www.chooseintercept.com
47	Orasure Technologies	63	www.chooseintercept.com
20	Pacific Handy Cutter	26	www.phcsafety.com
10	Pacific Handy Cutter	27	www.phcsafety.com
48	Petzl America	5	www.petzl.com
29	PUMA Safety	51	www.puma-safety.com
21	PUMA Safety	75	www.puma-safety.com
22	Radiation Safety & Control Services	81	www.radsafety.com
33	Royal Products	95	www.mistcollectors.com
49	SafeStart	12-13	www.safestart.com/ohs8
42	Safety Rail Company	57	www.safetyrailcompany.com
11	Safety Rail Company	91	www.safetyrailcompany.com
65	SKC	58	www.skcinc.com
50	SKC	59	www.skcinc.com
23	Streamlight	39	www.streamlight.com
12	Streamlight	39	www.streamlight.com/PSLII
31	ULINE	87	www.uline.com
51	Voluntary Protection Programs Participants' Association	46-47	www.vpppa.org/events

New Products

307	Brass Knuckle	93	www.ohsonline.com/productinfo
308	Casella	93	www.ohsonline.com/productinfo
304	Cority	92	www.ohsonline.com/productinfo
311	Ergodyne	94	www.ohsonline.com/productinfo
305	Guardhat	92	www.ohsonline.com/productinfo
303	HEMCO	92	www.ohsonline.com/productinfo
313	HEMCO	94	www.ohsonline.com/productinfo
302	KEEN Utility	92	www.ohsonline.com/productinfo
309	KEEN Utility	94	www.ohsonline.com/productinfo
310	Magid Glove & Safety Manufacturing Co.	94	www.ohsonline.com/productinfo
312	Milwaukee Electric Tool	94	www.ohsonline.com/productinfo
314	Red Wing Shoe Company	94	www.ohsonline.com/productinfo
316	REEBOK	95	www.ohsonline.com/productinfo
317	RITEHITE	95	www.ohsonline.com/productinfo
306	Tillman	92	www.ohsonline.com/productinfo
301	VelocityEHS	92	www.ohsonline.com/productinfo
315	Westex: A Millken Copmany	95	www.ohsonline.com/productinfo

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