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Tencate protective fabrics

CIRCLE 21 ON CARD
FROM THE EDITOR

Checking Out VPPPA’s Big Show

In scheduled to attend the Voluntary Protection Programs Participants’ Association, Inc’s 30th annual national convention this month at the Gaylord National Hotel, and I’m expecting it will be an excellent conference. VPPPA, now comprising more than 2,300 sites with upwards of 900,000 employees, expects about 3,000 people to attend the Aug. 25-28 event to check out some of the educational sessions and a big expo that I’m eager to visit. Looking over the list of exhibitors, I believe this conference’s expo has grown as large as the AIHce conference’s exhibits and is as eclectic as the ASSE conference’s expos.

Our magazine has partnered with VPPPA for the past two years, trying to help them publicize their annual conference and offering a "supercast" of two webinars presented by experts who had also presented sessions at the one of the association’s regional conferences. These have gone very well: While 932 people registered to attend our 2013 webinars, our June 25, 2014, webinars on emergency evacuation and incentives (both from the Region 25, 2014, webinars on emergency evacuation) achieved in all environments. Technical inaccuracies should be notified of any such fatality or catastrophe at that site, and explained that the assistant secretary’s office and the Director of Cooperative and State Programs should be notified of any such fatality or catastrophe. OHS

JERRY LAWS
jlaws@1105media.com

We’ll post reports from the national convention on our website, so be on the lookout during those late August days for items of interest about leadership keynotes and educational sessions.

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Over the past year, Mr. Thomas facilitated several wear trial programs — large and small, weeks to a few months — that resulted in almost all switching to TenCate Tecasafe® Plus.

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Blake Thomas at Blake@WearTSP.com can set up a wear trial for your organization. Also, learn more about Tecasafe® Plus with Coolderm™ Technology by visiting TenCateFabrics.com/TryFRC

CIRCLE 20 ON CARD
features

VISION PROTECTION

10 Laser Safety: The Eyes Have It!
Eye injuries are of primary concern. The effect to the eye depends on various factors, including pupil size, pigmentation, laser pulse duration and repetition, and wavelength.
by Chuck Paulausky

CONSTRUCTION SAFETY

14 Three Reasons Why Construction Companies Fail When Trying to Predict Injuries
We need to change the mindset that these machine-based methodologies must be viewed skeptically or cynically.
by Griffin Schultz

LOCKOUT/TAGOUT

18 Lockout/Tagout Accident Investigation
We could point to several mistakes that were made in this case, but the root cause does not belong entirely to the worker.
by James R. White

SPECIAL SECTION: HAND PROTECTION 23

24 Hand Safety Matters
When you begin a glove trial, it is important to consider as many application-specific issues as possible.
by Dave Gelpke

28 Addressing Hand Protection Regulations in the Oil and Gas Industry
Requirements for proper protective equipment may be overlooked in this booming industry.
by Beemal Vasani

PROTECTIVE APPAREL

32 If You Can’t Stand the Heat
As temperatures go up, rates of PPE compliance tend to go down.
by Jake Hirschi

35 FR Garment Comfort: Explaining the Mystery
It is extremely important to consider the three pillars of comfort—heat and moisture management; fabric hand; and garment fit/design—when evaluating your options.
by Joel DeNardis

INFECTION CONTROL

38 Proper Use of Disinfectants
Use them sparingly. Many pathogens are becoming immune to some of the disinfectants and sanitizers previously used to eliminate them.
by Michael Wilson

CONFINED SPACE

40 Beware of These Five Common Confined Space Myths
Test your knowledge and recognize the real threats.
by Rick Argudin

2014 NSC CONGRESS

42 Southern (California) Charm
One of OSHA’s top concerns this year, the safety of temporary workers, is the focus of the Sept. 16 Occupational Keynote.
by Jerry Laws

IH/LAB SAFETY

43 Don’t Forget the Lab
Accountability is the key, so get everyone involved in housekeeping.
by Keith Bilger

departments

4 From the Editor
8 Newsline
46 New Products
47 Product Spotlights
48 Classifieds
48 Literature Library
49 Advertiser Index
50 Breakthrough Strategies

by Robert Pater

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CIRCLE 23 ON CARD
On the Move

Honeywell Life Safety has promoted Sean Clay to general manager of its Sensors Division and made Alexandre Naef sales leader for the division, which employs more than 1,000 people globally and includes gas sensor manufacturer City Technology and fire detection/evacuation brands System Sensor and KAC Alarm Company. Clay reports to David Wilson, VPGM of the wider Systems & Sensors Division within Honeywell Life Safety (HLS). Clay previously was sales director for the HLS Sensing & Devices division. Naef formerly was managing director of Jude Medical in Switzerland and general manager of Johnson & Johnson Medical Devices in Paris. “Alexandre will be a great asset to Honeywell with his extensive global brand experience,” Clay said. . . .

All Star Incentive Marketing (www.incentiveusa.com) has added industry veteran Jim Drakakis to its team. He has held senior sales and marketing management positions for O.C. Tanner, BI Performance Improvement, and other companies, according to All Star Incentive Marketing President Brian Galonek. “I have known Jim for more than a decade and have always respected his abilities and work ethic. He will be a great fit in a culture that already practices what it preaches,” Galonek said. . . . Mike Flagg was elevated to vice president of Kimberly-Clark Professional North America, the company announced June 3. Flagg, a 26-year veteran at Kimberly-Clark, had been the leader of KCP’s Global Industrial Sector and the interim leader for its global sales and marketing teams. “I’m thrilled to be able to lead a group that passionately lives our brand promise to create exceptional workplaces—ones that are healthier, safer, and more productive,” Flagg said.

California Supreme Court: Target Had No Duty to Provide AEDs in Stores

Target Corporation is not required to have automated external defibrillators at the ready in its California stores, the California Supreme Court ruled unanimously June 23. The decision, which held that Target’s common law duty of care to its customers does not encompass AEDs, came to the state’s highest court as a request from the 9th U.S. Circuit Court of Appeals, which asked the California Supreme Court to rule because the 9th Circuit concluded California precedents did not provide sufficient guidance to answer the question.

The case is Michael Verdugo, et al. v. Target Corporation, No. S207313. It was filed by the mother and brother of Mary Ann Verdugo, 49, who suffered sudden cardiac arrest while shopping with them Aug. 21, 2008, in a Target store in Pico Rivera, Calif. Paramedics responded to a 911 call but were unable to revive Verdugo, according to the decision. The plaintiffs contended Target’s failure to maintain AEDs in its stores was a substantial cause of her death.

Up to now, every state appellate court that has confronted this legal question has ruled that the business’s common law duty does not require that it have AEDs in place in its stores. Chief Justice Tani Gorre Can- til-Sakaye wrote in the majority opinion. Justice Kathryn M. Werdegar wrote a separate concurring opinion.

Cintas and Sqwincher Seek ‘Hottest Job’ Entries

Cintas Corporation and The Sqwincher Corporation are holding a “Hottest Job in America” contest for employees in high-heat environments. The deadline for submissions is Sept. 1, 2014.

“With summer in full swing, people such as landscapers, road workers, miners, and factory workers can easily overheat,” said Jay Bruscato, vice president- First Aid & Safety at Cintas. “By rewarding a hard-working employee with prizes to beat the heat, we’re bringing awareness to the dangers of workplace heat stress and the solutions that can help alleviate it.”

To be eligible, applicants must identify why their work environment is hotter than the average workplace. The entrant with the most compelling story will receive two tickets to a 2014 season NFL game, Cintas moisture-wicking performance polos, cooling collars, and a variety of Sqwincher products for their company.

To submit an entry, apply online at www.cintas.com/hottestjob.

Awards & Recognition

■ The International Maritime Organization announced that its 2014 IMO Award for Exceptional Bravery at Sea will be awarded to Capt. Andreas Kristensen and his crew of the Britannia Seaways, who were nominated for it by Denmark for their courage and determination in fighting explosions and fire on board the vessel Nov. 16, 2013, in the North Sea. Bad weather prevented helicopters dispatched from Norway from rescuing the 20 crew members and 12 passengers; the crew managed to extinguish the fire 13 hours after it began and the ship reached Bergen, Norway, a few days later. No one on board was injured during the emergency, according to IMO’s announcement.

■ The awards ceremony is scheduled for Nov. 17.
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Let’s face it...some respirators are as comfortable as a beard of bees! But now, with the new 7000 half mask and 9000 full face series, respiratory protection has never felt so easy. Unlike others, the 7000/9000 feature lighter weight, fewer parts, less maintenance, wider field of vision, easier cartridge attachment, and are completely PVC-Free and metal-free. All this at an economical price. Compliance just got a whole lot easier.

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CIRCLE 25 ON CARD
Pierre Gougelman had the first glass eye factory in the United States in 1851. At first, the public thought artificial eyes actually gave their wearers new sight. If only glass eyes worked that way! Unfortunately, some lasers can result in permanent retinal damage and blindness.

Lasers have many common applications these days, everything from barcode scanners and laser pointers to military laser targeting and weapons, and a wide range of medical and industrial applications. It’s this last group that I’m most familiar with, having worked for several companies as the Laser Safety Officer.

**Laser Light**

Laser light differs from ordinary light in three ways:

- **Monochromatic**—Laser light consists of one color or wavelength. In contrast, ordinary white light is a combination of many colors or wavelengths.
- **Directional**—Lasers emit light that is highly directional, that is, laser light is emitted as a relatively narrow beam in a specific direction. Ordinary light, such as from a light bulb, is emitted in many directions away from the source.
- **Coherent**—The wavelengths of the laser light are in phase in space and time. Ordinary light can be a mixture of many wavelengths.

It is these differences that make the laser beams useful and potentially hazardous.

**Laser Radiation**

Lasers produce non-ionizing radiation, which is less hazardous than ionizing radiation, which can interfere with normal cell processes. Lasers operate within a specific range in the electromagnetic spectrum, including ultraviolet, visible, infrared wavelengths. Within this range there is the Retinal Hazard Region, which includes visible and near infrared wavelengths. Eye exposure within this region can result in permanent retinal damage.

**Laser Classes**

Lasers are categorized by class, with Class 3B and Class 4 being of major concern, falling under regulatory requirements for laser safety programs. Basic classes include:

- **Class 1**—These are generally safe as long as they are not disassembled. The maximum permissible exposure (MPE) is not likely to be exceeded. Common uses: CD-ROM players, drives.
- **Class 2/2a**—There is a potential hazard if you stare into the beam, but the human blink reflex usually prevents damaging exposures. Example: supermarket barcode scanners.
- **Class 3a**—These may pose an eye hazard if collected or focused into the eye. The MPE can be exceeded, but risk of injury is low. Example: laser pointers.
- **Class 3b**—These pose a serious eye hazard if direct or reflected beam is viewed, but diffuse exposures should not be hazardous. Examples: research applications, some industrial uses.
- **Class 4**—There is an eye hazard if direct, reflected, or diffusely-reflected beam is viewed, resulting in devastating or permanent eye damage. These also have potential for significant skin damage. They also may pose a fire risk and fume hazard, depending on the use. Examples: research, manufacturing.

**Laser Bioeffects**

Lasers can result in significant skin damage, so skin must be protected, but eye damage is the primary hazard. Beam damage can be in three forms:

- **Thermal**—This is the result of heat generated and absorbed at the site of exposure, causing burns to skin and eyes.
- **Acoustic**—This produces a mechanical shockwave similar to the wave effects of dropping a pebble into a pond. Acoustic effects can cause local vaporization and tissue damage.
Photochemical—Certain wavelengths can generate chemical reactions in tissue, which in some cases can result in cataracts, corneal or retinal burns, and a greater risk of skin cancer.

Skin effects will vary from minor redness and soreness to as much as third-degree burns, depending on the laser class, pulse duration and repetition, and wavelength.

Eye injuries are of primary concern. The effect to the eye depends on various factors, including pupil size, pigmentation, laser pulse duration and repetition, and wavelength. Different wavelengths will penetrate the eyes to different levels, causing damage at that level and to the cornea, lens, or retina:

Far Ultraviolet (UV-B&c) and Far Infrared (IR-B&c)

Exposures at this level can impact the cornea through absorption. Typical injuries would be corneal burns and “welder’s eye,” a condition evidenced by severe irritation and a feeling of sand in the eyes. Sunlight is in the Far UV range and can have the same affect. These injuries are usually temporary.

Near UV (UV-A)

These exposures result in absorption of the radiation in the lens. The effects can be delayed and may not happen for several years. Cataracts are a typical lens injury and may require surgery to repair.

Visible & Near Infrared (IR-A)

Exposures in this range can damage the retina. These exposures can be more damaging due to the focal magnification, which can increase the irradiance by ~100,000 times! Injuries can be temporary, but retinal burns can result in permanent vision loss. If the area of the retina damaged is the Macula, this can result in loss of central vision. Interestingly enough, macular degeneration, a condition common to aging in which blood vessels swell and can cause major macular damage, is treated by lasers to cauterize the swollen vessels, resulting in smaller areas of damage and small spots of central vision loss.

Laser Terms

Basic laser safety terms are used to identify, understand, and calculate the protection requirements for a specific laser operated at specific settings. Any changes to a laser setting will likely change these calculations, which are critical to employee safety:

- MPE (Maximum Permissible Exposure) is the highest laser energy to which the eye or skin can be exposed for a given laser. The MPE is similar to OSHA’s Permissible Exposure Limits for chemical exposures.
- NHZ (Nominal Hazard Zone) is the area within which the exposure to direct, reflected, or scattered radiation exceeds the MPE. No controls are required outside of the NHZ.
- NOHD (Nominal Ocular Hazard Distance) is the distance along the laser beam axis beyond which the MPE is not exceeded.
- OD (Optical Density) is a logarithmic measurement of attenuation for protective filters, such as laser eye protection. The OD defines the specific level of protection for a specific laser when operated at specific settings.

Engineer Controls

There are a variety of controls available, depending on the type of exposure. Examples include, but are not limited to:

- Interlocks, installed on process enclosures and guards to prevent the laser from firing or to close a shutter, stopping the beam.
- Beam housings, used to contain an exposed laser beam between the point of origin and the work.
- Shutters, which are used as doors that close to stop the beam. These can be interlocked with guards, doors, and other computerized functions.
- Remote firing controls that position the operator away from the exposure.
- Attenuators, which are used to decrease the power as a beam passes through reflective or absorptive filters or scattering media. The desired level of attenuation is at least the calculated Optical Density for the specific laser in use.
- Class 1-rated enclosures, which must be certified for Class 1, or the requirements for the actual Laser Class must be met.
- Fume exhaust, to be used when the process generates potentially toxic fumes.
- Laser barrier curtains, which can be used to surround a laser operation to protect anyone outside the curtain from exposure.

Administrative Controls

There are a variety of administrative controls that provide additional protection through signage, labels, Standard Operating Procedures, and training. Ensure that responsibility for laser operations is assigned.

Many states have specific requirements for Laser Safety Officers and laser incident reporting. These requirements usually only apply to Class 3B and Class 4 lasers. Be sure to check with the agency responsible for laser safety in your state. Many states refer to or incorporate ANSI Standard Z136.1 for Laser Safety into the state requirements, which may include laser registration, inspections, medical surveillance, ocular history, and a variety of other requirements.

Personal Protective Equipment

PPE is used as a last resort, when engineering and administrative controls don’t ad-
Laser PPE may include:
- Gloves or special clothing, to reduce skin exposure
- Laser eyewear, to attenuate the laser radiation for eye protection.

Laser safety glasses must meet very specific requirements:
- They must be approved and labeled per ANSI Z136.1.
- They must have the appropriate OD for the laser type, wavelength, mode of operation (continuous versus pulse wave), and power settings.
- They should be comfortable for the wearer.

Non-Beam Hazards
There are a number of hazards not directly related to the laser beam exposures:
- Explosion hazards may exist from accumulation of high-pressure gases in flash lamps, when fired. Also, some lasers use capacitor banks that can explode when not handled properly. Always follow manufacturer’s recommendations when servicing lasers.
- Gas exposures from cryogenic and other gases used in generation of certain laser types. Always follow safety procedures for gases and cryogenics.
- Toxic fumes or Laser-Generated Air Contaminants (LGAC) from materials being processed by the laser beam. Fume exhaust systems will reduce this exposure.
- Electrical exposures through contact with power sources. Electrical safety and LOTO procedures should be followed.
- Class 4 lasers are capable of causing fires. Use flame-retardant materials when possible and always keep a fire extinguisher nearby.

Some of the most common causes of laser accidents include:
- Bypassing interlocks. This is always a bad idea.
- Inserting reflective objects into the beam path.
- Accidental firing of the laser.
- Altering the beam path or adding additional optical components.
- Changing the laser settings without recalculating the MPE and Optical Density requirements.

Laser Safety Plans
Written plans may be required but, required or not, I always develop Laser Safety Plans for my clients that define the equipment, MPE/NHZ/NOHD, Optical Density/PPE requirements, training, and all other factors for safe operations of the lasers.

Chuck Paulausky, CHMM, is president of CPSE LLC, a consulting firm specializing in OSHA and EPA compliance and loss control for small to medium-sized businesses. As LSO for several companies with laser operations, he has maintained laser safety compliance for more than 17 years, including Laser Safety Plans, registrations, training, and reporting. He is active with several professional and business organizations and is an AHMP Champion of Excellence Award winner. He can be reached at 480-694-1975, cpaulausky@cpsafety.net, or www.cpsafety.net. This updated article was originally published in the January 2014 issue of the Journal of Environmental Management-Arizona.
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CIRCLE 6 ON CARD
A study in collaboration with a group of Carnegie Mellon University researchers found that future workplace injuries can be predicted with accuracy rates as high as 80-97 percent. By applying these predictive analytics practices in the real world, construction companies are successfully predicting and preventing workplace injuries, resulting in millions of dollars in savings, stronger safety cultures, and increased workplace productivity.

Hard to believe? Why? Predictive analytics has been used successfully for years in other business functions, such as sales, marketing, and finance. A recent study by Ventana Research claims that predictive analytics has "entered the mainstream." Bain and Company found that companies who adopt "big data" analytics are twice as likely to be in the top quartile of financial performance within their industries.

Predictive analytics works, and now it's being used to save lives on construction job sites around the globe. Nonetheless, when contractors try to implement predictive analytics, they often struggle with three main challenges.

Challenge #1 – The Wrong Tool for the Job

A helicopter is a very powerful and versatile tool. However, you could never get to the moon with one. Some pretty basic laws of physics simply make it impossible. The same is true when attempting to predict workplace safety incidents using Microsoft Excel or other, similar tools. Some simple laws of math and computational power are going to hold you back.

In his book "Competing on Analytics," Tom Davenport suggested that basic data analytics tools allow us to answer only simple business questions such as "what happened, how many, how often, and where." These sound much like the lagging indicators that most construction safety professionals are trying to shed nowadays. Lagging indicators can tell us only what has already happened. While such information is readily available in basic data tools that allow us to query data and run reports, these basic activities don't transform data into actionable information. One of the best quotes I ever heard is, "Leaders don't want reports, they want answers."

In order to get the most out of our data and answer more strategic business questions such as "why is this happening" and "what if these trends continue," Davenport suggests that we use more advanced analytics capabilities, such as statistical analysis, forecasting, and extrapolation. Ultimately, he contends, if we want to predict the future by answering the question of "what will happen next," we need to employ predictive analytics. This simply can't be done effectively with basic analytics tools.

Well beyond Excel, many of the most cutting-edge advances in predictive analytics are coming from the field of machine learning. Machine learning, one of the highest forms of predictive analytics, is when computers learn without being explicitly programmed by humans. They learn simply by consuming extremely large data sets. Using advanced analytics techniques such as support vector machines, decision trees and forests, and neural networks, computers can unlock trends, patterns, and correlations in the data in a way that humans and basic analytics tools cannot.
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CIRCLE 10 ON CARD
Challenge #2 — Not Enough ‘Big Data’

If you’re going to employ advanced analytics tools, predictive models, and even machine learning algorithms, you’re going to need to fuel them with a very big data set. Machine learning prediction techniques can be extremely accurate and effective, but the machine needs a vast amount of data in order to learn. In today’s era of big data, this seems easy. After all, according to IBM, 2.5 quintillion bytes of data are created every day—that’s the number 25 with 18 zeroes after it. IBM also claims that 90 percent of the world’s data has been created in the last two years; 2.9 million emails are sent every second, 20 hours of video is uploaded to YouTube every minute, and Google processes 24 petabytes of data per day.

Construction companies specifically are collecting more and more safety data every day in the form of job safety analyses, inspections, audits, observations, near misses, root causes, and contributing factors. But except for the biggest of the big general contractors (GCs) who manage hundreds of projects a year, it takes most contractors several years to amass a big data set sufficient to drive high-powered machine learning programs.

Even if contractors, including large GCs, are able to amass enough independent variables (those used to predict safety incidents), they might not have enough historic dependent variables (those used to predict safety incidents). If you lack enough of either variable type, the machines can’t learn. Further, if you have just enough to train the models, and even machine learning algorithms, you’re going to need to fuel them with a very big data set. Machine learning prediction techniques can be extremely accurate and effective, but the machine needs a vast amount of data in order to learn. In today’s era of big data, this seems easy. After all, according to IBM, 2.5 quintillion bytes of data are created every day—that’s the number 25 with 18 zeroes after it. IBM also claims that 90 percent of the world’s data has been created in the last two years; 2.9 million emails are sent every second, 20 hours of video is uploaded to YouTube every minute, and Google processes 24 petabytes of data per day.

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machines, you could be without enough data to test the predictive algorithms that the machine has developed. Regardless, you need a big data set that is often beyond the reach of most contractors on their own.

To overcome this challenge, construction companies often need to pool their data sets with other contractors whose data is structured like theirs. This data pooling is what the aforementioned Carnegie Mellon team used to drive their predictive analytics results.

Challenge #3 – People Don’t Trust Machines

In many ways, humans simply have a hard time trusting machines. This is changing over time as people become more accustomed to interacting with machines in everyday life, but hesitation still lingers.

There are many folks who simply do not believe that machine-based prediction methodologies are valid or reliable. They believe that humans are better predictors, especially in the field of construction safety, where human behavior and ever-changing job sites play such strong roles in safety outcomes.

However, research shows that we should have a little more faith. In a blog post titled “Are You Smarter than an Algorithm?” based on some of famed researcher Daniel Kahneman’s work, Jim Harris suggested that “humans are incorrigibly inconsistent in making summary judgments of complex information. When asked to evaluate the same information twice, they frequently give different answers.” Harris went on to say that “Kahneman’s review of separate studies on the reliability of judgments made by auditors, pathologists, psychologists, organizational managers and other professionals revealed that they contradicted themselves 20 percent of the time when asked to evaluate the same case on separate occasions.” Kahneman was quoted as saying that, “by contrast, algorithms do not suffer from such problems. Given the same input, they always return the same answer.” In a Harvard Business Review blog post about “Convincing People NOT to Trust Their Judgment,” Andrew McAfee came to similar conclusions. According to McAfee, “as the amount of data goes up, the importance of human judgment should go down. Human intuition is real but it’s also really faulty.”

Some of us are cynical about machines simply because of how powerful they have become. I have encountered professionals in construction safety who are concerned about computers taking over their job. As someone who works in this field every day, I can tell you authoritatively this is not going to happen any time soon.

While these three challenges to prediction are real, we can’t let them stop construction companies from employing these cutting-edge strategies in their safety programs. As Bain and others have found, those that do perform better and achieve better outcomes.

Generally through technology innovation, we must ensure that analytics tools are accessible and easy to use so that construction safety professionals can make a difference with their use. We must also demand access to the big data sets that will serve as fuel for these analytic tools, whether they reside in government agencies, think tanks, or even construction industry trade groups. Finally, we need to change the mindset that these machine-based methodologies need to be viewed skeptically or cynically.

Griffin Schultz is the General Manager at Predictive Solutions Corporation (www.predictivesolutions.com).
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Lockout/Tagout Accident Investigation

We could point to several mistakes that were made in this case, but the root cause does not belong entirely to the worker.

BY JAMES R. WHITE

Lockout/tagout was one of the first requirements OSHA mandated, starting in 1990. The electrical lockout/tagout regulation became effective in 1990, as well as part of Subpart S. Lockout/tagout training is conducted ad nauseam in every facility in the United States. All of us in the field have had repeated training on lockout/tagout. Lockout/tagout is often the topic of tailgate meetings and safety briefings. It is probably human nature to hear something so often and from so many sources that we go on autopilot at times. Instead of going through the procedures deliberately, even the best of us may not hit it as hard as we should. The following true case study illustrates this point.

The project involved maintenance work that was being performed by several contractors at a company’s location in the Midwest (the host). The work involved medium-voltage switchgear in a building and an outside substation. The switchgear was of a standard metal-clad, drawout, vacuum interrupter design and was in excellent condition. As can be seen in Figure 1, the switchgear also was marked with the single-line on the front of the gear.

Figure 1. Switchgear involved in the incident.

The worker involved in the incident was assigned to clean the switchgear and vacuum bottles in a section of equipment that had been properly locked out, tagged out, tested, and grounded. The work on this section of switchgear had been ongoing for a couple of days. One of the other contractors asked the worker to clean and test a circuit breaker cell that was not on the original list of equipment to be maintained. The host company that owned the equipment approved the addition of this circuit breaker cell to the list. The circuit breaker cell was to a bus tie breaker that had been deenergized the evening before but had been returned to service. (See Figure 2.)

Figure 2. The location of the incident.

It was believed that it was communicated to all the companies that were considered to be either authorized or affected that the bus tie breaker had been returned to service. Locks, tags, and signage were in place from all parties except the worker who was asked to do the maintenance. Because the company that employed the worker was not scheduled to perform any maintenance on that particular circuit, the company was not perceived to be affected or authorized when the LOTO was performed.

Safety is not about just any one procedure or rule. It’s about slowing down, making a plan, and executing that plan.

The involved worker had completed a Job Safety Analysis (JSA) prior to the start of work that day but did not include the newly added circuit breaker cell, so the backfeed hazard caused by the tie breaker was not addressed. The affected worker did not place his own locks or tags on the switchgear because it was already secured (see Figure 3). The locks and tags were on the back side of the circuit breaker cubicle.

Figure 3. These locks and tags were on the back side of the cubicle.

The worker involved in the incident opened the door on the front of the circuit breaker cell in order to perform the assigned maintenance. He did not test the
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Because the company that employed the worker was not scheduled to perform any maintenance on that particular circuit, the company was not perceived to be affected or authorized when the LOTO was performed.

circuit. The worker knelt down on one knee and manually opened the shutters over the bus stabs. Figure 4 shows the exposed energized bus stabs with the shutters open.

As the worker extended his hand to begin cleaning the tie breaker cell, an arc flash and shock to the worker occurred. Other maintenance personnel in the area immediately came to his aid and extinguished the fire on his clothing and called 911. The injured worker was transported to a burn center where he received the appropriate medical attention. The worker survived this incident and received burn injuries to his right hand and a blow-out injury to his knee (Figures 5 and 6). After a fairly long recovery period, this worker should be able to continue on with his life, an option that many people in his situation would not have had under similar circumstances.

Figure 4. Exposed bus location.

Figure 5. Burn injuries on the worker’s right hand.

Figure 6. A blowout injury to the knee.

Under similar circumstances, companies have been known to fire employees for violating safety rules. That is one approach. He did not test the circuit prior to working on it. He did not complete a JSA. He did not consider how dangerous working bus tie circuits can be. No arc-flash protective clothing or PPE was worn. We could point to several mistakes that were made, but the root cause does not belong entirely to the worker. There were mistakes made by almost all parties involved. The host company

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I am not about to say that the worker involved in this incident was not taking safety seriously, but he failed to follow some fundamental safety rules like test-before-touch.

approved the additional cell maintenance without considering all of the consequences. Neither the host nor the contractor requesting the circuit breaker cell be added to the list advised the affected worker that the circuit had been reenergized.

Summary
When I was in boot camp, our drill instructor told us that assume makes an ass out of u and me. It was true then, and it is true today. In this instance, assumptions came into play several times, both by the worker and by the companies involved.

The good news is that it did not result in a fatality, but that does not relieve the pain and suffering that the employee had to endure. This same type of scenario is likely repeated at many job sites throughout the United States. Multiple contractors, dozens—maybe hundreds—of workers, power system equipment and devices; all of these have to be taken into consideration when performing maintenance activities. It can become a blur.

People are people, and people make mistakes. That is why we have OSHA regulations, NFPA 70E, company procedures, policies, etc. Most if not all of us have either been involved in accidents or know people who have been. It’s not like it’s a secret that people make mistakes, but talk to some and they seem to think only others have that failing.

Safety is not about just any one procedure or rule. It’s about slowing down, making a plan, and executing that plan. There are plenty of tools available to help us: policies, procedures, codes, standards, federal regulations, and state and local laws.

I am not about to say that the worker involved in this incident was not taking safety seriously, but he failed to follow some fundamental safety rules like test-before-touch. If he had taken just that one step, there would be nothing to write about.

James R. White has been the Training Director of Shermco Industries, Inc., in Irving, Texas, since 2001. He is the principal member for Shermco Industries on the NFPA technical committee "Recommended Practice for Electrical Equipment Maintenance" (NFPA 70B). He represents the International Electrical Testing Association (NETA) as an alternate member of the NFPA Technical Committee "Standard for Electrical Safety in the Workplace" (NFPA 70E), is NETA’s principle representative on the NEC Code Making Panel CMP-13, and represents NETA on the ASTM F18 Committee "Electrical Protective Equipment For Workers." He is an IEEE Senior Member who received the IEEE/PCIC Electrical Safety Excellence award in 2011 and NETA’s Outstanding Achievement Award in 2013. He is a past chairman (2008) of the IEEE Electrical Safety Workshop and is the author of two books available through American Technical Publishers, "Significant Changes to NFPA 70E – 2012 Edition" and "Electrical Safety, A Practical Guide to OSHA and NFPA 70E."
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Addressing Hand Protection Regulations in the Oil and Gas Industry

Hand Safety Matters
Hand Safety Matters

When you begin a glove trial, it is important to consider as many application-specific issues as possible.

By Dave Gelpke

Workplace hand injuries are a leading cause of lost workdays and emergency room visits around the globe. From minor to life-threatening and everything in between, these injuries can be costly to employers and life-changing for employees.

Besides the obvious physical harm to workers, hand injuries also take a financial toll. According to the Bureau of Labor Statistics and the National Safety Council, U.S. workers sustain about 110,000 lost time hand injuries every year. In 2009-10, the cost per injury, including medical and indemnity, was $21,918. Hand injuries across all industries result in an average five to 11 days away from work, not counting rehabilitation.

Most hand injuries are preventable. BLS reports that on-the-job hand injuries result in more than 1 million emergency room visits in the United States each year. Among those who are injured, 70 percent of workers report they were not wearing gloves at the time the incident occurred. That's 700,000 hand injuries that could have been prevented or reduced with proper hand protection.

While glove use is not the only way to protect against hand injuries, the right hand PPE is a crucial component of any safety program. Introducing a hand safety program that your employees buy into can go a long way toward creating a safer and more productive work environment.

There are many types of gloves available today to protect against a wide variety of hazards. The nature of the hazard and the operation involved affects the selection of gloves. Because gloves designed for one function may not protect well against another, it is essential that workers use gloves designed for the hazards and tasks found in their workplace.

But how do you know you’re using the right gloves? Field testing is the best method to evaluate your options, and involving employees in the process of glove selection can go a long way toward worker buy-in.

Field Testing: Six Steps for a Successful Glove Trial

A glove trial is the process of field-testing different models of safety gloves, in order to identify the best glove for a particular job. When done correctly, the benefits of a glove trial include:

- Improved hand safety program and equipment
- Reduced rate of hand injuries
- Increased awareness of hand safety issues among workers
- Higher rates of compliance with hand safety PPE requirements
- Reduction in costs related to hand injuries

Step One: Assess the Hazards and Work Environment

When you begin a glove trial, it is important to consider as many application-specific issues as possible. Answer these questions in detail:

- What hazards are present? Do a thorough assessment and make a list of all existing and potential hazards. These may include metal, glass, wood, sawing or cutting tools, blades or knives, wire, needles, hammers, scaffolding joints, pipes, insulation, connections, etc. Are there cut hazards in the form of long, sharp edges? What about possible pinch and smash injuries from dropped tools?

- How much protection is needed? Gloves may need to be cut level 5 to provide sufficient protection, or you may only need a cut level 4 or less. If there are impact hazards, you’ll need a glove with back-of-hand impact protection. Some applications require heat resistance, anti-vibration padding, or chemical exposure protection.
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Choose people for the trial crew who are serious about safety on the job and who will provide honest and constructive feedback about the gloves.

- **How much dexterity is required?** Do your workers require a high level of tactile sensitivity in order to do their jobs? Will they be picking up small parts or handling sheets of plywood or steel beams? Dexterity needed on the job must be taken into account in glove selection, especially if workers are removing their gloves to complete high-dexterity tasks.

- **Where is the job being performed?** Identify details of the environment where your employees are doing the majority of their work. Is it excessively hot or cold? Does the environment change based on the season, or does it stay fairly constant throughout the year?

- **Are there potential grip issues?** Grip can be affected by mud, oils, cleaning fluids and other workplace substances. Poor grip can lead to increased hazards from dropped tools and knives, in addition to increased fatigue and strain.

- **What is the temperature of materials being handled?** Do workers regularly handle tools or parts that are extremely hot or cold? This can affect glove properties such as grip, protection level, and durability.

- **Are there any corrosive materials?** Consider whether there are fluids such as solvent or acids present that could break down the glove fibers or coating.

**Step Two: Identify the Most Common Applications**
The key to finding the right glove for the job is to look at the applications and tasks that are representative of most of the work being done. Select a glove that offers the necessary levels of comfort, protection, and dexterity for the most common, day-to-day tasks.

Although it is tempting to look for a one-glove-solution, the reality is that a single glove can almost never meet all needs. If you outfit your entire workforce with a glove that is suited only to the easiest job, or the most hazardous, or the application that only occurs once a week or once a month, it may provide too little protection—or too much—for the work they’re doing every day. This will have a negative impact on glove compliance, safety outcomes, and the overall effectiveness of your hand PPE program.

If necessary, offer a different glove for use with an extreme or unusual task. Most of the time it is best for workers, and for your hand safety program, to use a glove that offers the right level of protection for the work performed most often.

**Step Three: Audit Your Current Glove Program**
An audit of your existing glove policy will help you understand what is working, what isn’t, and areas where improvement is needed. Learn what your employees like about the gloves they use now. Find out where the glove isn’t meeting their needs. Identify any trade-offs between a new glove and the old.

By collecting this information, you can work to ensure that the trade-offs are minimized and that new gloves used in the trial offer the same features that your work crews have become accustomed to. You can address any objection that may come up during the trial, selection, and implementation process.

**Step Four: Select Your Trial Crew**
Choose people for the trial crew who are serious about safety on the job and who will provide honest and constructive feedback about the gloves. Encourage them to share their experiences, personal preferences, anything that might be relevant to glove selection. Be clear that this feedback will help determine which gloves are ultimately provided to the entire team. Let them know that their feedback will be shared with the glove manufacturer and could result in product improvements.

Get an agreement from the crew that they will provide written feedback as well as the glove samples at the end of the trial, since both are needed to make the best decision. Provide feedback forms that are easy to use.

**Step Five: Collect and Review the Data**
When you’ve reached the end of your field testing period, collect all of the feedback forms and the gloves that were used in the trial. Give the trial crew a chance to offer verbal feedback, recording anecdotes and stories of any “saves” from accidents or injury that occurred during the glove trial. Collect and review the written feedback forms. Examine the trial glove samples and note their condition with regard to cut resistance and durability of fabric. Include all relevant information in your report.

**Step Six: Develop Final Glove Specifications**
Using the feedback and other data collected during your glove trial, you are now in a good position to develop final gloves specifications. Companies accomplish this in a variety of ways, so you may have an existing format to follow. If you have questions about how to put together hand protection specifications, a representative of your glove manufacturer should be able to help. After you have conducted your glove trial, you and your team will have established a process to accurately and efficiently examine different aspects of your PPE program—and this extends beyond gloves. Your workers, having an opportunity to provide input into the decision making process, will better understand and support your glove policy, resulting in fewer incidents.

Dave Gelpke, QSSP, is the Director of Sales at HexArmor, a global PPE manufacturer specializing in high-performance hand, arm, and body PPE products that exceed industry standards for protection against cut, puncture, impact, and needle hazards. He has been involved in the evaluation of risks and development of unique, highly cut-resistant PPE solutions, as well as the implementation of hand safety policies, on five continents and for many industries, including pulp and paper, steel, recycling, mining, power generation, and oil and gas. His clients include Weyerhaeuser, Georgia Pacific, RockTenn, U.S. Steel, ExxonMobil, ConocoPhillips, and Halliburton. To contact him, email dave@hexarmor.com.
An alarming number of professionals put themselves at significant risk for injury—or even worse—by not wearing PPE apparel as mandated by industry standards and corporate policies. For many who routinely face the challenges of heat exposure and heat exhaustion, the primary reason for their non-compliance is comfort.

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The oil and gas industry in the United States is in the midst of a historic boom, with employment up 40 percent since the recession began in 2007 and 60 percent since it officially ended in 2009. An additional 100 American factories, with 1 million associated jobs, are scheduled to come on line by 2017.

The vast majority of jobs in the oil and gas industry carry risks far beyond the typical workplace. According to the Bureau of Labor Statistics, 138 oil and gas workers were killed on the job in 2012, and the fatality rate in the industry is nearly eight times the national workplace average. The risks are omnipresent, from upstream (extraction) to midstream (transportation) to downstream (refining). Workers come in contact with heavy chains, pipes, and equipment in difficult, slippery conditions and can be exposed to flash fires at any time.

Despite the risks, regulations related to personal protective equipment in the U.S. oil and gas industry are extremely limited. The rest of the world is no different—in fact, overall safety standards are much more lax outside the United States. Every day, these workers go to work lacking the PPE necessary to keep them safe from heavy moving objects and debilitating burn injuries.

Workers in this extremely hazardous environment need and deserve better protection. It’s time for the industry to adopt standards and regulations that mandate (1) education about workplace risks and safety practices and (2) the use of appropriate PPE, starting with hand protection.

**Adjusting to an Evolving Workplace**

Oil and gas is among the world’s fastest-growing industries, and the United States is the driving force globally. In 2013, domestic crude oil production increased by 1 million barrels per day—more than the combined increases in the rest of the world and the largest observed annual increase in U.S. history. And that’s just crude oil. The United States also remains the leading natural gas provider worldwide.

Digging deeper, the growth is driven by increased extraction by hydraulic fracturing (fracking) and transportation demands extending the midstream segment. From 2006 to 2012, midstream companies invested almost double what they did from 1992 to 2006, yet pipeline capacity is tight. Oil and gas transportation via rail, truck, and barge is at its highest level since the government began tracking it more than 30 years ago.

Not surprisingly, these new activities have only expanded the basic performance requirements for PPE used on work sites. The industry demands productivity, and workers require gloves that offer excellent grip, dexterity, moisture resistance, and, most of
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Workers at extraction sites battle invert mud—a sticky, sludgy mud created during the extraction process—that tests the limits of the highly flammable polyester, cotton, or synthetic leather gloves commonly used in the industry.

Common Injuries and the Importance of Flame Resistance

These are dangerous work environments. Historically, the most common injuries are related to extreme impact or crushing. At this point, the best preventative measures for crushing involve:

- education—making sure workers understand the dangers and take steps to keep their hands away from hazardous areas, and
- the use of high-visibility gloves that help the wearer and co-workers be more aware of hand placement.

The frequency and severity of impact injuries and abrasions can be prevented with the use of adequate hand protection. Although there are many different approaches and glove designs, the best maintain holistic impact protection without reducing performance or dexterity.

The risk of fire isn't new to the oil and gas industry, but it is increasing as the industry evolves. Fracking creates explosive gases, and flash fires are more common than with traditional drilling. And the more that oil and gas are diverted from pipelines, the more they come in contact with transportation workers who are an accident away from a rupture. Despite the fact that 16 percent of fatalities in the oilfields result from fires and explosions, flame-resistant clothing mandates are limited to some upstream environments, and mandates for gloves are non-existent. Again, this is unacceptable.

Consider: The hands are the contact point for every worker and the instinctive first line of defense in the event of a flash fire. This exposes the hands, and flammable gloves can serve as an unintentional and ill-fated transport mechanism when they ignite. These types of accidents can cause excruciatingly painful and life-changing injuries. Material that isn't flame resistant melts into the skin, damages underlying tissue and nerves, and often is impossible to remove completely. At best, it results in diminished dexterity; at worst, the result is complete loss of use of the hands. Flame-resistant ("FR") gloves—defined as those that extinguish within two seconds—can significantly reduce both the extent and severity of burn injuries.

The Technology is Here

Oil and gas workers are making unnecessary compromises, wearing gloves that provide adequate grip but poor impact protection or impact protection without flame resistance. These compromises aren't necessary. New technologies present PPE options that meet every performance requirement without sacrificing much-needed protection.

New interior glove linings provide a water barrier inside the outer layer of the glove, so water doesn’t degrade the coating of the glove and moisture never reaches the hand. Additionally, the same concept used to make tires grip the road is being applied to gloves, channeling oil and water away from the hand and providing a firm grip in slippery conditions.

To address flash fire risks, gloves are now available that meet the flame resistance...
NFPA 2112 standard to deliver protection against fire without impeding dexterity or comfort.

These new products balance the protection oil and gas environments require with the performance the industry demands, in ways that were never possible before. Now that these solutions are available, it’s important that workers are made aware that safety doesn’t require a productivity tradeoff and are educated on how proper hand protection should be used. A commitment to education and adherence is just as important as providing workers with the right product.

While there are costs associated with continued education, they are minimal compared to the costs of injury—lost productivity, training replacements, and potentially long-term care considerations.

**Time for a Change**

With glove technologies available that meet every performance requirement and safety standard, there is no reason oil and gas workers should be at risk of severe hand injuries due to ineffective PPE. Industry-wide regulations mandating the use of appropriate hand protection are needed and should specifically seek to:

- Impose guidelines specific to impact resistance. It’s time for the industry to collaboratively develop and agree upon standards for impact resistance, with accompanying requirements for use of gloves that meet those standards.
- Require FR gloves whenever FR clothing is mandated. If a work environment is so hazardous it requires flame-resistant torso protection, the same requirement should be in place for the hands.
- FR should be Level 4, at minimum, and should require use of FR materials, rather than less-effective spray coatings that often dissipate after a few washings.

These are simple steps that could prevent thousands of injuries every year, and the workers in the oil and gas industry deserve no less.

**Beemal Vasani** serves as Director, Customer Marketing Specialty Markets, North America, at Ansell. He has more than 15 years of sales, product management, and marketing experience in various industries, including food, consumer package goods, and personal protective equipment. For more information, visit www.ansell.com.

**Sources**

- [http://www.eenews.net/stories/1059386375](http://www.eenews.net/stories/1059386375)
- [http://www.bis.gov/lif/oshact51.htm](http://www.bis.gov/lif/oshact51.htm)
- [http://www.eia.gov/todayinenergy/detail.cfm?id=14531](http://www.eia.gov/todayinenergy/detail.cfm?id=14531)

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If You Can’t Stand the Heat

As temperatures go up, rates of PPE compliance tend to go down.

BY JAKE HIRSCHI

It's August, the hottest time of the year for much of the United States. In many work environments, the challenges of heat exposure and heat exhaustion only intensify during these summer months, often resulting in unbearable working conditions. Workers are faced with a choice: to comply with safety policies and wear their required layers of protective apparel or to remove a layer (or two) to help them be more comfortable. This is not a difficult decision for an alarming number of people.

The reality at work sites across the United States is that many workers may not be wearing personal protective equipment (PPE) as mandated. An online survey conducted by Kimberly-Clark Professional in August 2012 found that an astounding 82 percent of safety professionals polled had observed workers failing to wear PPE during the past year.

Non-compliance with PPE standards is consistently listed as a top concern for safety professionals, as shown in the Kimberly-Clark workplace safety search since 2006. In fact, 2012 marked the sixth year of a PPE non-compliance rate of at least 80 percent.

In every work environment, the importance of complying with PPE standards is repeated on safety calls, in safety meetings, and in safety training. Many workers have seen their co-workers get injured or worse, yet they continue to put themselves at risk for serious injury or even death by not following important safety procedures. Why is this?

Complying With PPE Protocols Can Be a Double-Edged Sword

Some workers believe that donning protective apparel as mandated by their employer (or to meet a safety standard requirement) impedes their ability to do their job and may put them at greater risk in completing their work assignments. Their activity load, combined with their required uniform, may make them too hot and sweaty and thus at significant risk to succumb to heat stress. Work clothing may restrict their movement to the point that they are unable to perform their job correctly, increasing their likelihood of being injured or jeopardizing their employment should they make a disastrous mistake. These men and women think that if they alter or remove the restricting clothing article, they will be able to perform their job to the best of their ability, which in turn lessens their “need” for PPE.

The prevalence of this mentality that workers don’t need PPE is substantiated in the 2012 Kimberly-Clark survey; more than half of the safety professionals surveyed attributed non-compliance to workers thinking that safety equipment was not needed.

More and more workplaces require personnel to perform multiple tasks across different hazard zones in their facilities. Diverse hazardous environments require different, and often flexible, protective solutions. PPE required in one department may not be necessary in another in which the need for protection is not as severe.

Simply because the danger isn’t immediately evident doesn’t mean the proper use of protective apparel is less important. Workers sometimes do not recognize or understand that, even when they may not be in impending danger of being hurt, some PPE protocols are designed to prevent problems linked to long-term exposure.

Comfort Equals Compliance

OSHA guidelines for selecting PPE state: “Employers should take the fit and comfort of PPE into consideration when selecting appropriate items for their workplace. PPE that fits well and is comfortable to wear will encourage employee use of PPE.”

Yet comfort remains another common instigator of PPE non-compliance, according to the Kimberly-Clark survey. In fact, most of the top reasons cited in the survey for non-compliance were comfort-related, including that protective apparel is too hot, fits poorly, or looks unattractive.

Improving comfort to increase PPE compliance is of the utmost importance. It is common for PPE decision-makers to settle on protective apparel that has a “lack of discomfort” but just meets the minimum level of protection required for their workplace. Measuring comfort can be very subjective. The protective properties of a fabric can be precisely measured through standardized testing, but what may be comfortable to one person may seem uncomfortable to another.

There are testing standards that are designed to estimate comfort (such as the Kawabata Evaluation System, or KES), and other standards are designed to evaluate thermal comfort. Combining the data from these tests helps to assess the overall comfort of a given fabric or garment.

The thermo-physiological comfort of a garment is simply measured by a fabric’s permeability to air, heat, and water. Increased air flow results in increased breathability, leading to better moisture management, and the air flow, in turn, allows heat to dissipate more efficiently.

The amount of air that passes through a garment, or air permeability, can be measured using test methods described in ASTM D 737-04 and ASTM F 1868-04. Measuring heat permeability is also listed in ASTM F 1868-14 and is defined as “Total Heat Loss,” or THL. THL is the amount of conductive (dry) and
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evaporative (wet) heat loss that occurs through a fabric or multiple fabric layers in an ensemble. Water permeability, or moisture management, can be assessed through several methods, including tests for moisture wicking (both vertical and horizontal wicking),\(^6\) drying time (there are a variety of test methods used to determine drying time),\(^7\) and evaporation percentage.\(^8\)

Finally, size and cut are extremely important for a garment to fit comfortably. While it may be a simple concept, it is often difficult to ensure that protective apparel fits properly in a workplace needing a wide range of sizing options to fit both men’s and women’s body types and to defend against a variety of exposure hazards. A loose-fitting garment may provide additional thermal insulation and greater mobility, while a tighter fit will reduce the risk of that clothing’s being caught in machinery. Finding the appropriate balance in the fit of a garment is vital. Despite their best intentions, safety managers are sometimes forced to select protective apparel for their work environment based on which options provide the highest level of protection without exceeding budget constraints—an especially important decision driver. While comfort or “wearability” is often not the primary deciding factor, it is important to invest in protective apparel that workers will want to wear.

**Enhancing Comfort Without Compromising Safety**

Until recently, safety managers’ choices for comfortable protective apparel have been limited. To put it simply, mass matters, and the more mass that can be placed between the wearer and the hazard (be it molten metal, arc flash, flame, or even cut protection), the better. Comfort-driven protective apparel (i.e., lightweight material) has not historically offered enough protection to be seriously considered for use in extremely hazardous environments.

But PPE fabric and clothing manufacturers have risen to the task of developing lighter-weight solutions that combine a high level of protection with maximum comfort. NFPA 70E Hazard Risk Category 2-rated garments continue to get lighter and lighter, and more flexible and light-weight options for extreme environments are now available. PPE apparel manufacturers have also created lighter-weight, flexible alternatives for clothing that is commonly perceived as being heavy and rigid, such as aluminized apparel.

Layering is an optimal and flexible solution to increase protection. Lightweight protective apparel allows workers to wear multiple layers when undertaking hazardous tasks, while maintaining comfort. With a layered clothing system, two plus two often equals five when it comes to thermal protection. Air trapped between two light-weight layers provides additional insulation, and two lighter-weight or lower-rated garments often can provide the same or even better protection when worn together than a single, heavier primary protection layer. Also, with a layered approach, employees can wear heavier, higher-rated outer gear in extreme-risk situations and then remove this clothing when the threat of injury is not as great and still be protected by a lighter-weight protective base layer.

It may seem obvious: If protective apparel is comfortable, more workers are going to wear it. Increased compliance with PPE standards results in fewer injuries. Fewer injuries mean safer workers, a reduced number of worker’s compensation claims, and greater cost savings for employers.

To achieve these results is going to require the support and engagement of safety managers year round—not just when the mercury rises.

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**REFERENCES**

1. Survey conducted with 110 people over the Internet in August 2012. All survey respondents were responsible for purchasing or influencing the purchase or selection of PPE.
2. Occupational Safety and Health Administration (OSHA), Personal Protective Equipment, OSHA 3151-12R 2003.
6. AATCC Test Method 198-2013: Horizontal Wicking of Textiles. This test method is used to evaluate the ability of vertically aligned fabric specimens to transport liquid along and/or through them. AATCC Test Method 198-2013: Horizontal Wicking of Textiles. This test method is used to evaluate the ability of horizontally aligned fabric specimens to transport liquid along and/or through them.
7. AATCC Test Method 199-2011: Drying Time of Textiles. A very simple test method is intended to evaluate the drying time of knit, woven, or nonwoven fabrics at an elevated temperature using a gravimetric moisture analyzer. By performing the test at non-standard textile conditions, it is possible to simulate drying at body temperature or to perform testing at temperatures that simulate conditions of use.
8. Evaporation percentage and drying time can be determined using the Gravimetric Absorbency Testing System (GATS).
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FR Garment Comfort: Explaining the Mystery

When it comes to selecting flame-resistant (FR) garments, there are many variables to consider, including protection, comfort, durability, appearance, style, cost, and quality. Although each of these criteria will influence your purchasing decision to some extent, there is no question that protection should be your primary concern. Key industry standards, such as National Fire Protection Association (NFPA) 2112, serve only as a minimum; therefore, it is critical that a hazard assessment be conducted, because not all FR garments perform the same in an exposure.

Likewise, not all FR garments provide the same performance when it comes to comfort attributes. Due to advancements and innovations in FR technology, a wearer no longer has to make a trade-off or sacrifice their protection to be comfortable. As a result, FR garment comfort has rapidly become a key factor in a wearer’s purchasing decision.

Why Comfort Is Important

Being uncomfortable can put workers at risk. When FR garments are not comfortable, workers are more likely to take shortcuts with wearing their personal protective equipment (PPE) and job task. In fact, according to a recent National Safety Council Study,1 89 percent of workers have observed other workers failing to wear PPE. The top reasons given for failure to wear FR PPE are that the garments are uncomfortable,2 and too hot.

In a third-party market research study,3 FR garment wearers said that light weight and breathability were the two most important garment comfort features, followed by garment fit, softness, and moisture management.

By selecting FR garments that provide protection and comfort, your workers will be more likely to wear them—and wear them appropriately. This will not only increase compliance to FR safety regulations, it also can increase productivity, reduce heat-related illnesses, and improve worker morale.

Comfort Is a Complex Issue

Simply stated, comfort is the combination of the garment properties and each individual’s perception or preference, with the region and work environment having significant influence on this comfort perception. However, the issue of comfort can seem very confusing because there are many variables involved.

For FR garments, comfort can be influenced at every manufacturing step—from the type of fiber (natural or synthetic) to the fabric weaving construction/finish and final garment design. Comfort also can be influenced by the effects of laundering, including shrinkage and the touch and feel. It is important to not make judgments on comfort based solely on one attribute, but to consider the garment and the work environment in which it will be worn.

Perhaps the most challenging issue is the fact that comfort is subjective. That’s why the best test is a personalized wear trial. Wear trials can be time intensive, so it is important to use data as directional indicators of comfort. But what are the key attributes to look for in a garment before wear testing?

The key attributes can be divided into three pillars of comfort: heat and moisture management; fabric hand; and garment fit/design.

Heat and Moisture Management

The body regulates heat in four primary ways: radiation, convection, conduction, and evaporation. In hot and humid environments, evaporative cooling (wet heat transfer) is the primary heat loss method. In cooler environments, the other three methods (dry heat transfer) are more prominent. To manage heat effectively, each of these mechanisms must be considered for FR fabric and garment design.

Managing sweat/moisture is one of the most important aspects of heat management. Moisture travels in both vapor and liquid forms away from the body. While moisture vapor can pass between fibers and through openings in the fabric, liquid/sweat is transmitted from the skin to the fiber’s surface before evaporating into the air. Poor moisture management can make a garment feel clammy, clammy, sticky, and heavy.

Fiber type can be a differentiator in moisture management

Hydrophilic fibers, such as cotton, wool, silk, and cellulose, have an increased ability to absorb moisture and sweat. However, when saturated, these fibers swell, decreasing the fabrics’ ability to breathe, so garments can take longer to dry and can feel wet and heavy. Hydrophobic fibers, such as polyester, modacrylic, and aramid, absorb less moisture than hydrophilic fibers, but they dry faster due to lower moisture content.

Engineered fabric blends incorporate both fiber types to optimize moisture management. The key is balance.

Wicking is a critical indicator of heat and moisture management

Wicking, defined as the movement and dispersion of liquid through fabric, is a critical indicator of heat
and moisture management. High wicking can lead to feeling dry, increasing evaporative cooling. According to results from third-party research, wicking is the most effective process to maintain a comfort feel.4

In addition to wicking, a fabric’s ability to dry quickly can be considered to be almost equally important. Thicker and heavier fabrics are more prone to holding onto the moisture and not releasing it as quickly. A fabric should have a balance in its ability to absorb, wick, and dry to effectively manage moisture.

Fabric weight and air permeability have significant influence on heat and moisture management

Lighter-weight fabrics and more open fabric weaves increase air permeability, leading to garment breathability. Greater air permeability increases moisture movement through the fabric, leading to a wearer’s feeling dry and cool. Higher air permeability enables higher sustainable work rates and reduced likelihood of heat stress.5

When comparing different fiber/fabric types, it is important to remember that higher weight does not always equal greater protection. In fact, lower weight fabrics can not only meet, but exceed NFPA standards. Be sure to avoid compromising what is at the core of why you wear FR clothing, and that is protection so you can go home safe at the end of the day.

Measuring heat and moisture management multi-dimensionally
The innovative sweating manikin, which contains 34 temperature-controlled sensors, simulates sweat and heat production, taking into consideration garment design, fit, and construction. Although most comfort tests measure a fabric in only one dimension, the sweating manikin uniquely considers several fabric attributes all at once. This includes measuring both wet and dry heat transfer through two key tests: thermal resistance (ASTM F1291) and evaporative resistance (ASTM F2370).

Technology advancements continue to evolve the science of comfort as evidenced by the sweating manikin test and its ability to look more comprehensively at comfort and the impact an FR garment has on regulating body heat.

FR Garment Fit/Design
FR garment fit will vary slightly between manufacturers, so ensuring personalized sizing and conducting a wear trial are important factors in FR garment comfort.

An improper FR garment fit can negatively affect comfort by: increasing contact points between the garment and skin; creating unnecessary compression on the body; and feeling more clingy, clammy, and sticky. In addition, improper FR garment fit may lead to incorrect wearing and limited movement ability, potentially increasing a wearer’s risk on the job.

Another consideration, often overlooked, is to monitor FR garment fit on an ongoing basis. This is important because laundry shrinkage can have a major impact on FR garment fit and workers’ physiques can change over time.
Laundry shrinkage can vary depending on fabric type. FR garments with higher levels of shrinkage may lead to increased levels of discomfort for workers and higher overall costs due to the need for frequent FR garment re-purchasing.

Fabric Hand—The Touch and Feel of a Garment
Fabric hand is the feeling of a garment on your skin. Significant differences may be noticeable visually, whereas more subtle differences may be determined only through a more extensive analysis including wear trials. However, individual preferences can vary. A common and simplistic approach is to rub the fabric between your fingers, though this does not consider all aspects. Using international standards (ISO), an industry-leading French textile institute classifies fabric hand across 13 different attributes (e.g., smoothness, softness, suppleness, drape, warmth, and recovery), all of which can have an impact on a wearer’s perception if they are not in balance.

Laundering also can greatly affect the hand of an FR fabric, and not always for the better. After as few as just five launderings, third-party testing has shown drastic changes in an FR fabric’s touch and feel, with some significantly worse. This further underscores the importance of conducting a wear trial and laundering testing as part of the FR garment evaluation process.

The Sure Bet Is a Wear Trial
With an increased focus on providing your workers with comfortable FR garments, it is extremely important to consider the three pillars of comfort—heat and moisture management; fabric hand; and garment fit/design—when evaluating your options.

Data from third-party studies, such as those cited in this article, can provide valuable guidance about the comfort attributes of an FR garment. Poor performance in any one comfort attribute can make a garment undesirable. This information can help you determine which FR garment to put to the ultimate comfort test—a personalized wear trial. After all, a wear trial is the only sure way to determine the most comfortable FR garment for your workers.

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REFERENCES
Beware of These 5 Common Confined Space Myths

Test your knowledge and recognize the real threats.

BY RICK ARGUDIN

Nearly every industry contains tight spaces that are considered “confined” because their configurations hinder the activities of any worker who must enter, work in, and exit them. For rulemaking purposes, OSHA uses the term “confined space” to describe such areas.

Not only do confined spaces vary in size, shape and location, but often they present challenging conditions, from limited movement or hazardous air to the risk of engulfment. For example, workers who work in process vessels generally must squeeze in and out through narrow openings and perform their tasks while cramped or contorted. OSHA identifies more than 20 major sectors of industry and labor with various types of confined spaces, including tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, ductwork, and pipelines.

Even though confined spaces aren’t necessarily designed for human access, workers are required to go in and perform their jobs day after day. Creating and maintaining a safe job site in and around confined spaces depends on having correct, current equipment and information.

Here is your opportunity to test your confined space knowledge. Enhancing worker safety starts with recognizing the real threats and debunking five common misconceptions.

Myth #1: Falls aren’t an issue in confined spaces.
Confined spaces warrant the same level of fall protection consideration as above-ground work at height. Workers at height require fall protection for obvious reasons, but accidental falls can—and do—occur in confined spaces. To determine whether a confined space warrants the use of fall protection equipment, it’s crucial to evaluate the access point as well as the actual confined space.

A manhole is one example of a confined space that doubles as a fall hazard. Lack of proper safety equipment places all workers at an increased risk of falling through the unguarded opening as soon as the cover or hatch is removed. Once inside the confined space, the risk of falling deeper often exists. Falls while entering and exiting confined spaces are common, often caused by old and outdated climbing structures, poor lighting, and challenging space restrictions. In some situations, fumes can trigger loss of consciousness, affecting workers who enter the space or work near the area.

The use of reliable fall protection products, such as guardrails, barriers, and self-retracting lifelines or lanyards, is essential to prevent or arrest accidental falls. Restraint systems and barriers are designed to restrict a worker from reaching the edge of an opening, while fall arrest systems are designed to stop a fall in progress.

Myth #2: All confined spaces require a permit.
While cramped, tight spaces are found on almost every job site, only spaces that meet OSHA’s definition of a confined space and contain health or safety hazards require a permit. A thorough evaluation of the confined space, including atmospheric monitoring, should be conducted prior to any entry.

To require a permit, OSHA specifies that a confined space must meet one or more of the following conditions:
- Contains or has the potential to contain a hazardous atmosphere
- Contains a material that has the potential to engulf an entrant
- Has walls that converge inward or floors that slope downward and taper into a smaller area that could trap or asphyxiate an entrant
- Contains any other recognized serious safety or health hazards, such as unguarded machinery, exposed live wires, or heat stress

If a worker will be accessing a confined space with any of these circumstances, the employer is responsible for developing a written safety program to comply with OSHA standards (1910.146) prior to starting any work.

A strong confined space safety program should be structured around one common goal: workers’ safety and health. Specifically, the written program needs to discuss the means, procedures, and practices used to eliminate or control hazards and to ensure safe operations. In addition to preventative measures, the program should discuss air quality monitoring, exit and entry methods, and fall protection/rescue systems.

Myth #3: Permit-required confined spaces only require adequate identification and marking.
While clearly marking permit-required confined spaces is an essential step, appropriate signage isn’t the only action you’ll need to take. OSHA’s standard for an acceptable permit space program (29 CFR 1910.146(d)), further dictates that entry must be:
- Controlled and limited to authorized persons
- Regulated by a written entry permit system (entry permits must be recorded and issued for each entry into a permit space)
- Monitored by an attendant outside the space

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Myth #4: Non-entry rescue is always the best solution.

Combined with the unique hazards of confined spaces, including oxygen-deficient air, toxic and/or flammable gases, difficult entry and escape, and potential engulfment, non-entry rescue can be the safest solution for all parties involved. Although non-entry rescue is usually preferred, determining the smartest and safest rescue approach largely depends on the situation.

In many cases, confined space rescue situations can be too complex and dangerous for a non-entry rescue performed by an entry attendant with minimal training. Emergency service or industrial entry teams have more in-depth training and use specialized equipment necessary to save a worker trapped in a confined space. Keep in mind the only time an entry rescue should be performed is when non-entry rescue poses a greater hazard to the worker.

Don’t underestimate the value of proactively preparing a comprehensive plan to combat the uncertainties of confined space rescue. Designate capable personnel who can quickly perform the assigned rescue duties during an emergency, then provide the designated personnel the proper training and equipment to execute a safe and effective rescue.

Myth #5: Confinement is the most dangerous threat.

Asphyxiation is the leading cause of death in confined spaces. The asphyxiations that occur in permit spaces generally result from oxygen deficiency or from exposure to toxic atmospheres. There have also been cases where employees who were working in water towers and bulk material hoppers slipped or fell into narrow, tapering discharge pipes and died of asphyxiation due to compression of the torso. During silo work, employees have been asphyxiated as the result of ingesting finely divided particulate matter (such as sawdust) that blocks the breathing passages.

Additionally, OSHA has documented confined space incidents in which victims were burned, dismembered by auger type conveyors, or crushed by rotating or moving parts inside mixers.

Rick Argudin is a senior training specialist with Capital Safety, a leading designer and manufacturer of fall protection equipment.
Southern (California) Charm

One of OSHA’s top concerns this year, the safety of temporary workers, is the focus of the Sept. 16 Occupational Keynote.

BY JERRY LAWS

The 2014 NSC Congress & Expo is just a month away. This year’s event is expected to feature more than 14,000 attendees and 700-plus exhibitors’ booths filling several of the waterfront San Diego Convention Center’s halls during the Sept. 15-17 expo. The conference website is www.congress.nsc.org.

Everything about this year’s Congress is big and attractive—the exhibit halls, the educational program, the host city, the networking opportunities, and even the keynote presentations this time around. Popular presenters E. Scott Geller, Ph.D., and Charlie Morecraft are teaming up again to deliver the Motivational Keynote, “The Human Side of Injury Prevention,” starting at 8 a.m. Sept. 16. One of OSHA’s chief concerns this year, the safety of temporary workers, is the focus of the Sept. 16 Occupational Keynote, beginning at 12:15 p.m. The invited speakers for that one are OSHA Assistant Secretary Dr. David Michaels, NIOSH Director Dr. John Howard, and two leaders of search firm Yoh Services LLC—Chairman William Yoh and President Lori Schultz. Dale Lesinski, QSSP, vice president of DiVal Safety Equipment, is scheduled to present the Sept. 17 keynote, “Safe 4 the Right Reasons,” starting at 8 a.m.

Educational Highlights

Professional development seminars ranging in length from one day to four days are set for Sept. 13-14 and Sept. 17-19 on topics that include fundamentals of industrial hygiene, ergonomics, safe electrical work practices, fleet safety, and behavior-based safety.

The Sept. 15-17 educational program features more than 100 technical sessions and workshops organized in a dozen tracks. These cover practically every safety topic under the sun—from hearing protector fit testing to young worker fatality case studies, sudden cardiac arrest response, combustible dust, incentives, construction safety, best practices for employer cell phone policies, disciplinary programs, fall protection, electrical safety, drug testing, GHS/HazCom, OSHA’s suggested silica standard, hearing conservation, training, and many more.

A few other educational offerings will be offered in the expo: a Sept. 16 10 a.m. presentation of OSHA’s 10 most-cited violations for fiscal year 2014, immediately followed by a Solutions from ISEA Experts presentation about avoiding those very violations; and a new product showcase along the main thoroughfare aisle of the exhibits.

San Diego & Convention Center Highlights

A new attraction opened May 24 at the San Diego Zoo Safari Park: the Tull Family Tiger Trail, a 5.2-acre habitat for the park’s six Sumatran tigers (for those blessed with patience in abundance, the tigers occasionally make an appearance on the trail’s tiger cam, http://sdzsafaripark.org/tigertext/tigercam.html).

Truth be told, this city has something for everyone, from water parks and beaches to Balboa Park’s museums and other attractions—it ranks as San Diego’s 13th best activity on TripAdvisor—cruises and sailing, Coronado and the historic Hotel del Coronado, thoroughbred racing, the Birch Aquarium at Scripps Institution of Oceanography, the Gaslamp Quarter’s restaurants and shopping, and the spectacular beauty of La Jolla and Torrey Pines.

The San Diego Convention Center has won numerous recycling and waste reduction awards, and the San Diego Convention Center Corporation predicted last December that its economic impact this year would reach $1.4 billion. The center is about to undergo a $520 million expansion that will add 225,000 square feet of exhibit space, 101,000 square feet of meeting rooms, an 80,000-square-foot ballroom, and a five-acre rooftop park.

Future NSC Congress & Expo Dates

The annual conference returns to Atlanta next year and will take place Sept. 26-Oct. 2 (Sept. 28-30 expo). It moves to Anaheim in 2016 (Oct. 15-21, expo Oct. 17-19) and to Indianapolis in 2017 (Sept. 23-29, expo Sept. 25-27).

Jerry Laws is the editor of Occupational Health & Safety.
Proper Use of Disinfectants

Use them sparingly. Many pathogens are becoming immune to some of the disinfectants and sanitizers previously used to eliminate them.

BY MICHAEL WILSON

Due to the recent spread of a gastrointestinal virus in an industrial facility, the day porter maintaining the facility during the course of the business day was asked to disinfect all of the building’s cafeteria tables after the mid-day lunch break. It was suspected the cafeteria was one place the virus was spreading. To do this, he brushed off any dry soils on the table, sprayed the table with a disinfectant, and then wiped the area clean with a microfiber cloth. This was repeated five days per week and, for extra measure, sometimes the evening cleaning crew repeated the same procedure at the end of the business day.

For many people—cleaning professionals and facility administrators alike—the cleaning workers performed this procedure correctly. However, a closer examination reveals several errors. For instance:

- While brushing off the dry soils was correct, the cleaning worker should not have stopped there. In most cases, disinfecting is a two-step process. The first step is to properly clean the area; the second step is disinfecting. After brushing the dry soils from the tables, the worker should have wiped each cafeteria table with an all-purpose cleaner or similar product. Then, on to step two.
- Spraying the disinfectant on the tables simply applies it to them. In order for the disinfectant to actually work and begin “killing” pathogens on the table, it must dwell on the table for about 10 minutes without drying. This means the worker should have sprayed a few tables with the disinfectant and then returned to the first one to wipe it clean. If the disinfectant dries, it needs to be reapplied.
- How do we know this is the type of disinfectant that should be used to kill influenza-type viruses? It is possible the disinfectant used to clean these tables was not, and if so might prove to be ineffective. Every EPA-registered disinfectant in the United States has a “kill claim” on the product’s label or packaging materials identifying exactly what pathogens it is designed to eliminate.
- Microfiber tends to be more effective at cleaning and disinfecting than conventional terry cloths, and using a clean microfiber cloth is correct—but it must stay clean. The cleaning worker should have used a fresh quadrant of the cloth for each table and, after cleaning two to four tables, replaced the cloth.
- Having the evening cleaning staff clean and disinfect the tables once again is not necessary and may prove costly in terms of labor, time, and chemicals and can have a negative impact on the environment. If the procedure was performed correctly after the lunch break, an evening cleaning/disinfecting is not necessary.

From this example, we have learned some very important things about the use of disinfectants. One item at the top of the list is that unless the disinfectant’s label says it both cleans and disinfects, then cleaning and disinfecting are, as above, a two-step process. Another item is that selecting the proper disinfectant is imperative. A disinfectant known to eliminate the type of pathogens and microorganisms suspected to be on a surface must be used to protect human health. (There are broad-spectrum disinfectants, which can be viewed as all-purpose disinfectants and can be used when there is no specific pathogen or it is unknown. However, for a known pathogen, it is best to select a disinfectant designed to kill those microorganisms.)

Label Reading

We should delve a bit further into understanding disinfectants, and this starts with knowing how to read a product’s label. Of course, reading labels on any type of cleaning chemicals is always recommended, but it is even more important when it comes to disinfectants.

As mentioned earlier, disinfectants have kill claims posted on their labels indicating they can be used to kill, for example, the TB (tuberculosis) bacterium, HIV, MRSA (methicillin-resistant Staphylococcus aureus), or some other pathogen. However, the disinfectant that kills HIV may not work against the TB bacterium.

Other items typically listed on disinfectant’s label that cleaning professionals and administrators should be aware of include the EPA registration number, active and inert ingredients, precautionary statements, and efficacy. In many situations, a sanitizer will suffice in keeping an industrial facility healthy. While a disinfectant is designed to eliminate or inactivate all disease-causing germs on a surface (when used properly), a sanitizer is designed to reduce them, eliminating 99.9 percent of pathogens when compared to an untreated surface.

For help in selecting disinfectants, sanitizers, and most other types of chemicals, plus paper goods and cleaning equipment for their clients, some distributors now turn to web-based analytical tools. These tools can prove invaluable because they provide “fact based” suggestions. They have ready access to the products’ efficacy, kill claims, and other information that helps purchasers make the proper selection right from the start.

Use Sparingly

While disinfectants and sanitizers are here to help protect human health, they should be used only when needed. What we are discovering is that many pathogens are becoming immune to some of the disinfectants and sanitizers previously used to eliminate them.

Michael Wilson is director of marketing for AFFLINK (www.afflink.com). It is based in Tuscaloosa, Ala.
Don’t Forget the Lab

Accountability is the key, so get everyone involved in housekeeping.

BY KEITH BILGER

Quiet gentle giants of the safety world, and also a fixture of potential danger from universities to hospitals and from clandestine government facilities to state-of-the-art for-profit private industry, laboratories should be high on every safety professional’s short list of organizational safety concerns. Understanding of the layout, equipment, materials, workflow, and waste streams is crucial to both avoiding accidents entirely and responding appropriately to unfortunate events and dealing with the aftermath.

When was the last time you visited your lab past the front door? Do lab employees know whom to contact with safety concerns other than the AC or a backed-up drain? Now is as good a time as ever to evaluate your laboratory and build a stronger understanding of what is going on in there. Do your homework well ahead of time and know your hazards—all lab hazards are not created or resolved equally.

Ditch the Clutter

Fast-paced and deadline-driven laboratories often look to invite trouble. General cleanliness can go a long way toward avoiding workplace accidents. Clear the aisles, put items away when not in use, immediately clean up spills, and dispose of broken items. Slips, trips, and falls account for too many workplace injuries, which ultimately impact an organization’s bottom line.

Accountability is the key, so get everyone involved in housekeeping. This is one of those areas where if specific responsibilities are not assigned, then everyone assumes it will be handled by someone else. You can discuss with your organization’s lab director how to make this work by possibly tying these responsibilities to a section of his or her annual review.

Inspect from the ground up; make sure the flooring is appropriate for the use and storage is off the floor, able to be kept clean and vermin free. Make sure everything is kept labeled, organized, and stored, and that the entire department has a cleanup day regularly to discard, dispose, or repurpose items.

Safety Equipment and Hazard Evaluation

The lab is one area that thrives on being cutting edge . . . new and improved and the best of the best! Hopefully, your input as the safety guru is considered as your lab evolves, because as processes change, so do the needs of the lab. When conducting an inspection of your lab, ask about changes since the last inspection—equipment, tests, volume, wastes, personnel, etc. All of this information becomes valuable when looking for precisely the right safety equipment.

Where is the greatest potential for chemical splashes and spills relative to where the eyewash units and spill kits are located? In the event of a fire, do lab employees know where the fire extinguisher is mounted? And is it readily accessible, or is it obstructed? Is the fume hood flow rate tested as part of a preventive maintenance schedule and is the sash height set correctly? Who keeps the paperwork? Are new process or equipment changes affecting other processes negatively?

Make both fire safety and emergency preparedness cornerstones of your safety efforts. Invite the fire professionals in regularly. Train on fire safety, emergency management, first aid, and lifesaving skills. Know your safe way out and drill with your staff. Don’t tell them, show them you care. Make sure they have the tools needed for emergency operations and that the building itself is in compliance and has the needed safety measures for fire and emergency evacuation. As for non-compliant staff members, document this and divest yourself of them before someone dies. In a lab situation, there is little room for sloppy work.

When conducting an inspection of your lab, ask about changes since the last inspection—equipment, tests, volume, wastes, personnel, etc. All of this information becomes valuable when looking for precisely the right safety equipment.

Communication and Relationships

Open lines of communication are vital in keeping laboratories safe and operating smoothly. Safety professionals are often called upon to bridge the gap in communication between various departments to resolve all types of problems. Having a reputation for being approachable and getting things done will find you learning about safety concerns before a crisis presents itself—or at least when a crisis presents itself. Employees won’t be hiding incidents or avoiding the safety team, which, in turn, will create a more proactive workplace all around.

Relationships with key players will ease your challenges with the safety program. A good friend to have in your corner is the facilities/maintenance depart-
ment. Coordination and teamwork with this group of individuals will make safety improvements throughout the organization seamless. This department is a firsthand witness to many of a facility’s problems and can provide good feedback regarding areas of potential trouble.

A good example of this occurred last year at our facility: A pipe above our laboratory was leaking onto a new, extremely expensive piece of lab equipment below. The lab supervisor wasn’t sure whom to call off hours because no one answered the primary radio/phone due to a manpower shortage. But after placing plastic trash bags and a chair mat over the machine, he called the safety department and said in a dry monotone, “It’s raining in the lab. It is not supposed to be raining in the lab.”

The safety department immediately made sure several maintenance staffers from other areas were made aware of the situation. They managed to quickly divert the leak, repaired the leaking drain pipe, and did the necessary housekeeping to help with cleanup. The lab equipment was spared; other than a little lost time, it was no harm, no foul.

The backup option was to send any needed samples to an outside lab for processing if needed. Quick thinking and strong relationships among multiple departments averted a very expensive mess.

Personalities aside, make sure you know and talk with all of your departments regularly. You may not particularly like all of them, but professionalism counts—and you have to work with them and depend on them in a crisis. Make sure your workers such as housekeeping, maintenance, IT, and security know every safety team member by name and trust you enough to share information, because they will tell you many hazards that can be corrected before an injury occurs.

Lids, Leaks, Labels
When it comes to chemical safety in the laboratory lids, leaks, and labels take a priority. Are you able to tell what is in each and every bottle? Are caps on securely so as to not allow evaporation from a waste container or should a container be knocked over? Are containers marked as hazardous waste stored in secondary containment? Are acids and bases stored separately?

The precautions to exercise are many, but they are in place for everyone’s safety. Executives, maintenance, and housekeeping all may find themselves in the lab at one time or another, and without an effective lab safety program, an unfamiliar employee could become an unsuspecting victim.

(M)SDSs
Now is an excellent time to review your hazard communication program with the transition from MSDSs to SDSs ramping up. In the event of a chemical emergency, would you be able to locate the appropriate information sheet for the exact chemical responsible for the injury? How long would it take you to find it? Do your employees know where this information is kept and the steps to take should an incident occur? Go ahead and dust off the HazCom binder before having that conversation with the workers in the lab.

Strong Support and Oversight
Clean labs with informed employees supported by a leadership team promoting safety make for an ideal combination of leadership and execution. Sadly, we see in the news how bad things can happen when employees fail to follow policy and procedure, such as CDC’s recent potential anthrax exposure and staph even bioterrorism situations. Safety sets the foundation for consistency and regular monitoring of all aspects of lab operation.

Keith Bilger, BS, is a Safety Consultant I for the Central Prison Healthcare Complex with the North Carolina Department of Public Safety in Raleigh, N.C. He can be reached at kbilger74@gmail.com.

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The K-Sun PEARLabel 400IX General Labeling Solution pairs the new PEAR-Label 400IX thermal transfer printer with powerful new PC software for industrial and safety labeling, wide heat shrink tube markers, custom and compliant pipe markers, tags and more. The 400IX General Labeling Solution is designed for hazard communication, safety, 5S/Lean, GHS, manufacturing, warehouse and facility professionals. The K-Sun PEARLabel 400IX printer can print one-, two- and four-inch wide all-weather labels and pipe markers.

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#### CIRCLE # ADVERTISER INDEX

<table>
<thead>
<tr>
<th>CIRCLE #</th>
<th>ADVERTISER</th>
<th>PAGE #</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>BlueWater Manufacturing</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>CBS ArcSafe</td>
<td>22</td>
</tr>
<tr>
<td>8</td>
<td>CarbonX</td>
<td>27</td>
</tr>
<tr>
<td>10</td>
<td>Columbia Southern</td>
<td>15</td>
</tr>
<tr>
<td>29</td>
<td>CPM Symposium</td>
<td>38</td>
</tr>
<tr>
<td>4</td>
<td>Dickies FR</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>Dickies FR</td>
<td>33</td>
</tr>
<tr>
<td>11</td>
<td>Encon Safety Products</td>
<td>21</td>
</tr>
<tr>
<td>2</td>
<td>ESC Services</td>
<td>30</td>
</tr>
<tr>
<td>12</td>
<td>Glove Guard</td>
<td>31</td>
</tr>
<tr>
<td>14</td>
<td>Kovenex</td>
<td>46</td>
</tr>
<tr>
<td>61</td>
<td>Little Giant Ladder Systems</td>
<td>45</td>
</tr>
<tr>
<td>15</td>
<td>MCR Safety</td>
<td>2</td>
</tr>
<tr>
<td>25</td>
<td>Moldex-Metric, Inc.</td>
<td>9</td>
</tr>
<tr>
<td>35</td>
<td>Newell Rubbermaid</td>
<td>35</td>
</tr>
<tr>
<td>1</td>
<td>Nextteq LLC</td>
<td>12</td>
</tr>
<tr>
<td>16</td>
<td>Polartec®</td>
<td>29</td>
</tr>
<tr>
<td>17</td>
<td>Protective Industrial Products</td>
<td>51</td>
</tr>
<tr>
<td>33</td>
<td>Revco Industries</td>
<td>37</td>
</tr>
<tr>
<td>3</td>
<td>Rigid Lifelines</td>
<td>19</td>
</tr>
<tr>
<td>18</td>
<td>Sensidyne, LP</td>
<td>17</td>
</tr>
<tr>
<td>19</td>
<td>Superior Glove</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>TenCate</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>TenCate</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>3M</td>
<td>13</td>
</tr>
<tr>
<td>24</td>
<td>3M</td>
<td>25</td>
</tr>
<tr>
<td>13</td>
<td>Uvex by Honeywell</td>
<td>52</td>
</tr>
<tr>
<td>22</td>
<td>Vital ID</td>
<td>44</td>
</tr>
<tr>
<td>23</td>
<td>Workrite Uniform</td>
<td>7</td>
</tr>
<tr>
<td>60</td>
<td>Glove Guard</td>
<td>47</td>
</tr>
<tr>
<td>56</td>
<td>MCR Safety</td>
<td>47</td>
</tr>
<tr>
<td>57</td>
<td>Nextteq LLC</td>
<td>47</td>
</tr>
<tr>
<td>59</td>
<td>Protective Industrial Products</td>
<td>47</td>
</tr>
<tr>
<td>58</td>
<td>Rigid Lifelines</td>
<td>47</td>
</tr>
</tbody>
</table>

#### ADVERTISER INDEX

<table>
<thead>
<tr>
<th>CIRCLE #</th>
<th>COMPANY</th>
<th>PAGE #</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>Scaffold Training Institute</td>
<td>48</td>
</tr>
</tbody>
</table>

#### Product Literature

<table>
<thead>
<tr>
<th>CIRCLE #</th>
<th>COMPANY</th>
<th>PAGE #</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>BlueWater Manufacturing</td>
<td>48</td>
</tr>
<tr>
<td>51</td>
<td>Rutgers School of Public Health</td>
<td>48</td>
</tr>
<tr>
<td>53</td>
<td>The Safety Knife Company</td>
<td>48</td>
</tr>
<tr>
<td>52</td>
<td>Specialized Safety Products</td>
<td>48</td>
</tr>
<tr>
<td>54</td>
<td>VAC-U-MAX</td>
<td>48</td>
</tr>
</tbody>
</table>

#### Classifieds

<table>
<thead>
<tr>
<th>CIRCLE #</th>
<th>COMPANY</th>
<th>PAGE #</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>BlueWater Manufacturing</td>
<td>48</td>
</tr>
<tr>
<td>51</td>
<td>Rutgers School of Public Health</td>
<td>48</td>
</tr>
<tr>
<td>53</td>
<td>The Safety Knife Company</td>
<td>48</td>
</tr>
<tr>
<td>52</td>
<td>Specialized Safety Products</td>
<td>48</td>
</tr>
<tr>
<td>54</td>
<td>VAC-U-MAX</td>
<td>48</td>
</tr>
</tbody>
</table>

#### New Products

<table>
<thead>
<tr>
<th>CIRCLE #</th>
<th>COMPANY</th>
<th>PAGE #</th>
</tr>
</thead>
<tbody>
<tr>
<td>302</td>
<td>Capital Safety</td>
<td>46</td>
</tr>
<tr>
<td>303</td>
<td>Dialight</td>
<td>46</td>
</tr>
<tr>
<td>301</td>
<td>K-Sun</td>
<td>46</td>
</tr>
<tr>
<td>300</td>
<td>PMI, Inc.</td>
<td>46</td>
</tr>
</tbody>
</table>

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www.ohsonline.com | AUGUST 2014 | Occupational Health & Safety | 49

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0814ohs_049_AdIndex_v1.indd 49
Taking Back Leadership

Leaders are ceaseless problem solvers. Which means they’re either frequently confronted with snags or actively uncovering them. Obstacles that others, who are not as relentlessly driven toward improvement, often overlook or sweep under the carpet. By their nature, niggling issues can be longstanding, complex, difficult, where different systems, procedures, equipment, and other resources have already been tried, either with minimal or mixed results. Or where diminishing returns may have set in as things have improved to a point that has becomes comfortable, accepted, or deemed too entrenched to change. This then leads to a performance plateau.

Strong leaders are the opposite of complacent. Leadership guru Warren Bennis explained, “The manager accepts the status quo; the leader challenges it.” Superior leaders are concerned that stasis—even when conditions seem “OK”—soon leads to degradation because nature tends toward increased entropy. For example, maintenance professionals know that parts housed on a shelf can fail just by sitting there, even without strong mechanical forces seemingly acting on them (think of an old rubber band squirreled away in a drawer). The lesson? You’ve got to continue to improve or risk fall back or failure because, for better or worse, things never really stay the same. Relationships erode without being emotionally nourished, worker morale rusts, attention to tried-and-true programs evaporates. The same-old approaches get lackluster results, at best.

This has cascading effects: frustration and failure foster becoming perplexed, blaming, or, later, abandoning efforts to improve. Leaders often throw up their arms with, “Why won’t people just do as they’re told?” “Act in their own interest?” “Bypass doing simple things that could help them work safer?” It would better if such questions were really done, no changes needed, thank you.

For example, take back injuries, the plague of many companies, especially (but certainly not limited to) those with an aging workforce. I recently received a request for my view about an all-too-common incident. (I’ve made minor changes to protect anonymity): “…Injured employee climbed up onto truckbed to get his gear bag. As he bent over to pick up bag he felt a spasm in his lower back. He climbed off the truck and tried to walk it off. Employee stated he could not bend over and it hurt to walk. He told his supervisor what had happened. The further said he had previously had surgery on a disc in his lower back. When the supervisor asked if he wanted to see the doctor, the employee said he had experienced similar pain several times before, that he would be ok with rest. He continued to hurt for days afterwards and then told his supervisor he still had severe pain and wanted to see a doctor.”

My suggested considerations:

1. Many soft-tissue injuries stem from “the straw that broke the camel’s back”—i.e., are cumulative in nature. Often, someone experiences soft-tissue pain and/or injury from doing a task they think involves relatively little force or one they’ve done without noticeable incident thousands of times before. For example, have you ever heard of lower back pain or injury flaring from someone tying their shoes? Or getting out of bed? Or merely picking up a piece of paper off the floor? I’ve heard hundreds of such anecdotal reports associated with mundane, even innocuous actions. Perspective is important; while some look at the last thing that occurred as the “cause” of the injury, it’s often an action that may have “thrown them over the edge.” But in and of itself, it may not typically be why the person got hurt. To control perspective, it’s critical that leaders focus their efforts on helping people change how they perform even small tasks they might otherwise take for granted, to avoid tension/cumulative trauma building up everywhere (home and work).

2. Injuries, especially soft-tissue, often recur or become exacerbated. I’ve seen statistics that correlate previous incidence of lower back pain with 2-3x greater likelihood that the person will suffer similar pain future. Perspective: Perhaps the best time to help them readjust their decision-making and activities is when they’re not in throes of mind-altering pain. The time to treat is often not the best time to emphasize prevention.

3. Some cultural perspective questions: Perhaps that worker hadn’t previously alerted anyone in the company that he had past back issues? If not, why?

Perhaps the worker hadn’t alerted anyone in the company that he had past back issues. If not, why?

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