

## People Protection

**Anna Wells, Editor, IMPO** For industrial manufacturers, safety and compliance can sometimes become an ‘out of sight, out of mind issue’—meaning, it becomes most critical when there is a breach of protocol, or worse, an accident where an employee’s safety is put at risk.

Experts in a variety of industries weigh in on what they see as the most important areas to stress for their manufacturing customers—as well as what end users might be overlooking. Coupled with regular updates from OSHA, these tips can help plants keep a sound safety program in order to reduce or remove lost time accidents from the workplace.

**Dust Bust** “The biggest misconception among manufacturers is that OSHA is just presenting them with a guideline, not with something they have to do. The fact is, OSHA is beefing up enforcement of safety measures on several fronts,” says Tony Supine, technical director, Farr Air Pollution Control (APC).

Farr APC is a manufacturer of dust and fume collectors used to clean up industrial processes. According to Supine, OSHA outlines the specific applications where dust explosion hazard is at its highest risk: “In OSHA’s own words: ‘A combustible dust explosion hazard may exist in a variety of industries, including: food (e.g., candy, sugar, spice, starch, flour, feed), grain, tobacco, plastics, wood, paper, pulp, rubber, furniture, textiles, pesticides, pharmaceuticals, dyes, coal, metals (e.g., aluminum, chromium, iron, magnesium, and zinc), and fossil fuel power generation,’” he explains. “OSHA is trying to create a safe workplace, and if plant operators fail to understand the compliance measures required of them, or fail to treat those measures seriously enough, explosions can and will occur. Failure to comply may also result in shutdown and/or fines. OSHA recently fined a furniture plant more than \$100,000 for violations relating to alleged dust hazards.”

So what is a manufacturer’s best approach? According to Supine, it is important to find a dust collection equipment supplier who is knowledgeable about combustible dust explosion hazards and their mitigation solutions:

**OSHA Cheat Sheet** As an organization, OSHA offers scores of resources to help employers reach their compliance goals:  
**OSHA Training Institute (OTI):** The OSHA Training Institute provides training and education in occupational safety and health for federal and state compliance officers, state consultants, other federal agency

personnel, and the private sector. CEUs (Continuing Education Units) are available to participants in OTI courses in accordance with the administrative and program criteria guidelines established by the International Association for Continuing Education and Training. **OSHA eTools:** eTools are “stand-alone,” interactive, Web-based training tools on occupational safety and health topics.

They are highly-illustrated and utilize graphical menus. Some also use expert system modules, which enable the user to answer questions, and receive reliable advice on how OSHA regulations apply to their work site. **OSHA Safety and Health**

**Topics Pages:** These are designed to provide access to selected occupational safety and health information. The subjects of these pages include specific workplace hazards, as well as individual industries.

Members of the Editorial Boards evaluate numerous OSHA and non-OSHA references on a given subject to determine which they consider most important in reducing occupational injuries and illnesses. OSHA’s Safety and Health Topics Pages provide assistance for complying with OSHA standards, enabling employers to ensure safer workplaces. **OSHA’s On-Site**

**Consultation Service:** This offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. Consultation services are totally separate from enforcement and do not result in penalties or citations. Employers can find out about potential hazards at their worksites, improve their occupational safety and health management systems, and even qualify for a one-year exemption from routine OSHA inspections. It’s confidential, too. Your name, your firm’s name, and any information you provide about your workplace, plus any unsafe or unhealthful working conditions that the consultant uncovers, will not be reported routinely to the OSHA inspection staff. **The OSHA**

**Recordkeeping Handbook:** This resource is a compendium of existing agency

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approved policy, including the 2001 Recordkeeping rule (Regulatory text and relevant decision discussion from the Preamble to the rule), Frequently Asked Questions and the Letters of Interpretation. The handbook is available for download at [www.osha.gov/recordkeeping/index.html](http://www.osha.gov/recordkeeping/index.html) [1]. For more information on OSHA and its resources for manufacturers, visit [www.osha.gov](http://www.osha.gov) [2].

Can the supplier perform or commission the necessary dust testing? To determine whether a dust is combustible, it must undergo explosibility testing in accordance with ASTM test methods. Dust testing has become a critical component of every combustible dust safety program.

Is the explosion venting equipment manufactured by a company specializing in this area, or is it “home-made” by the dust collection manufacturer? Either way, the supplier should provide documentation that the equipment has been manufactured in accordance with NFPA 68.

Will the supplier provide a calculations sheet on vent sizing and vent ducting? This will be needed to ensure that equipment is properly sized for compliance and explosion protection.

Can the supplier perform a hazard analysis or recommend a qualified consultant for this task? Under the new requirements, plants must commission a hazard analysis or risk evaluation of the dust collection system, and keep the documentation on file to show local fire marshals or other officials.

Does the supplier have access to, and familiarity with, alternative protection technologies such as flameless venting and explosion suppression? These technologies may come into play in situations where explosion venting is not feasible.

**Lift Hazards** Material handling can introduce its own set of safety concerns, especially relating to lifting equipment. A team of experts at Gorbel, manufacturer of overhead cranes and lifting devices, explains some of the most critical misconceptions end users often have about lifting equipment.

According to Gorbel: Operators sometimes assume that just using the equipment makes the operation safer, but the equipment has to be used properly for it to be safe. Exceeding the rated capacity of a crane or lifting device, not reading the manual before installing or using the crane system, or not performing regular inspections and maintenance as recommended can all lead to unsafe use of the lifting equipment.

Manual lifting is often quicker than using a lifting device to lift a load, so operators sometimes mistakenly believe they’re less productive with a lifting device. Short

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term, they might work faster manually, but over the course of the day, their fatigue will increase and they'll become less productive with each hour if they continue with manual lifting. Using lifting equipment will maintain a consistent level of productivity throughout the day and prevent a lot of the fatigue they'd get from manual lifting.

Management might think adding any type of lift equipment will improve lifting safety, but if it's not equipment that the operators can easily learn and adapt to, they won't use it and it will be a wasted investment. Choosing equipment that is easy to learn and easy to use, providing proper training to operators, and giving them time to get used to new equipment, can greatly improve the success of adding new lifting equipment to a work cell.

Some of the more recent improvements in lifting equipment, says Gorbel, have come with improvements in technology that makes lifts more intelligent and intuitive, but primarily: "Improving safety with lifting equipment isn't just about finding a better alternative to manual lifting. It's also about anticipating unsafe situations that could arise and designing products that protect operators from injury during those situations. Beyond teaching customers safety best practices, we try to anticipate some of the un-safe situations that might occur while someone is using our equipment, and design our products with safety features that counteract those situations."

**On Guard** For a company like Pilz Automation, safety is at the core of the way it designs its products, especially since risks around complex machinery can be dire. Pilz has been at the forefront of many technology improvements in recent years to keep perimeter guarding more safe, while still retaining high functionality.

According to Marketing Manager Vito Curcuru, there are many reasons for companies to invest in automation technology in order to attain cost and safety benefits. The problem is, some manufacturers don't know about the available advancements in these technologies, and how mass adoption can make them cost effective. "We find there is basic knowledge of items like relays, switches and sensors, but the advancements made in these products can sometimes be lacking. For instance when it comes to using relays-most people know and understand why and where to use them, but they don't know it is often less expensive from a time, wiring, and unit cost to utilize a configurable safety controller (multi) vs. using many individual relays," says Curcuru.

"Also, there have been many advances in light curtains. In the past it was almost a one size fits all model, but now light curtains come in many sizes, from single point to several feet. With the advancements, we see costs of making a plant safe going down substantially. It may seem like there is more equipment involved, but the reality is, when we sit down with a manufacturer and outline a plan to keep the employees and machines safe, they often see substantial savings if they switch out equipment or have us do a risk assessment for them."

Curcuru adds: "OSHA plays a critical role now and has been adapting to some complex problems and situations. For instance, safety is now at a point where it is

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being built into the motion of the machine. It is now possible to not only make machines safe for humans but safe for the machine itself, which in turn makes it safe for humans. Motion control technology is now making sure that machine temperature, revolutions and all parts of the machine are safe and safely monitored. This goes a long way in preventing accidents.”

**An Approach To Training** From a training perspective, Reliability Center, Inc. (RCI) is no stranger to this area—in fact, says RCI President, Mark A. Latino, establishing a more comprehensive safety program is really no different than other improvement initiatives: “The process is comprised of being focused on the improvement goal, prioritizing the action items that must take place for the facility to attain the goal and to be proactive by acting on the prioritized items before they can become an undesirable event.”

Latino recommends manufacturers take a combination approach. “I would recommend Opportunity Analysis (OA) training, Root Cause Analysis (RCA) training, and Human Error Reduction Techniques (HERT) training.” Specifics of these training opportunities include:

**Opportunity Analysis (OA)** is a focusing and prioritizing tool similar to a Failure Modes and Effects Analysis (FMEA). The OA is different from traditional FMEA because it is looking at a historical snapshot. OA uncovers the kinds of incidents that have occurred over a year’s time and the impact of those events to the organization. The events are prioritized and sorted from largest to least impact.

Knowing the proper way to conduct an OA will provide knowledge to the facility about bodily injury types that happen most often, environmental mishap types and impacts, kinds of unsafe conditions that exist in the facility, etc.

**Root Cause Analysis (RCA)** is a rigorous problem-solving tool designed to get down into the system issues where the true root causes of incidents are located. Often safety incident investigations are focused more on compliance than solution. This is understandable because a facility must be in compliance with the law. Using a solid RCA approach can eliminate the incident’s mechanism so it will not be possible for recurrence, which often goes beyond compliance.

Training employees in RCA will give them the ability to create a factual problem definition. The problem definition is comprised of the Event and the Modes that contributed to causing the Event. By starting with facts, the analysis will end with root causes that are also facts. The result is the recommendations written to solve the root causes will be effective corrections for eliminating the incident mechanism.

Using the RCA tool to solve the incidents with the highest impact from the OA will provide a safer work environment for employees, which will reduce the incident rate.

Organizations that are effective in using the RCA tool know the human element is always involved in the chain of events that led to an incident. The point of human intervention is a juncture all investigators pay close attention to because human

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errors of omission and commission are prevalent in all investigations. Human error in the RCA process is termed as "human root causes."

**Human Error Reduction Techniques (HERT)** is designed to teach employees about the top-ten human error traps. When individuals unknowingly get caught in a human error trap the result is usually an accident or injury. HERT training identifies key junctures where people become vulnerable to a higher probability of making a decision error.

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### Links:

[1] <http://www.osha.gov/recordkeeping/index.html>

[2] <http://www.osha.gov>