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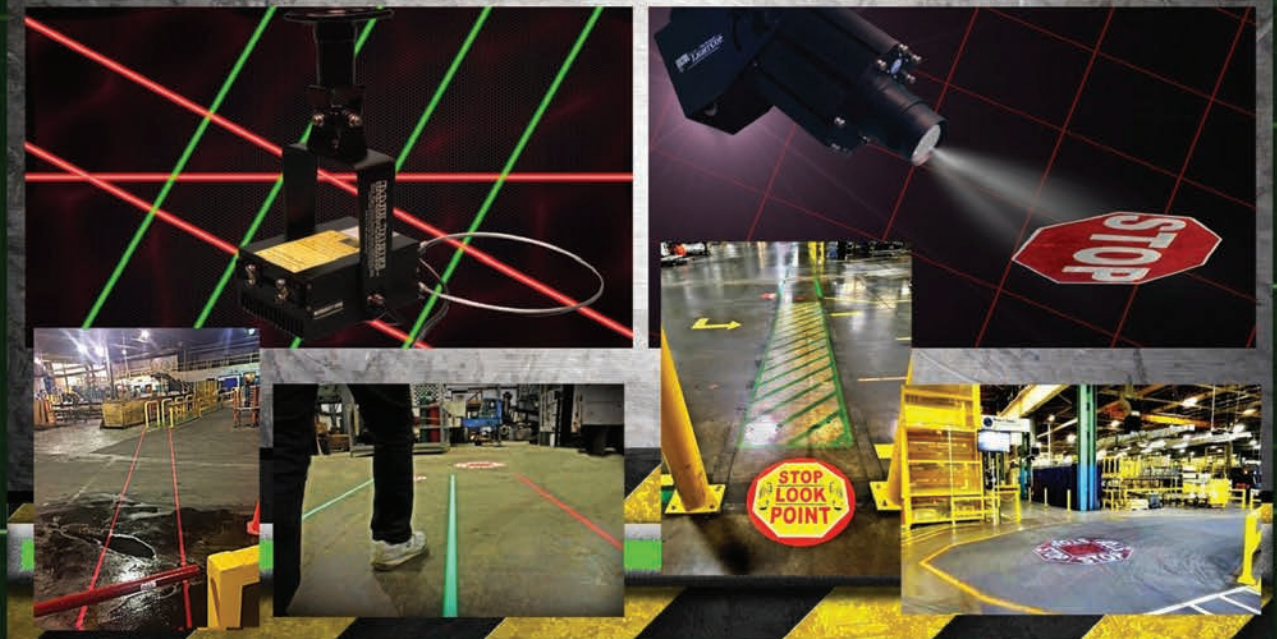


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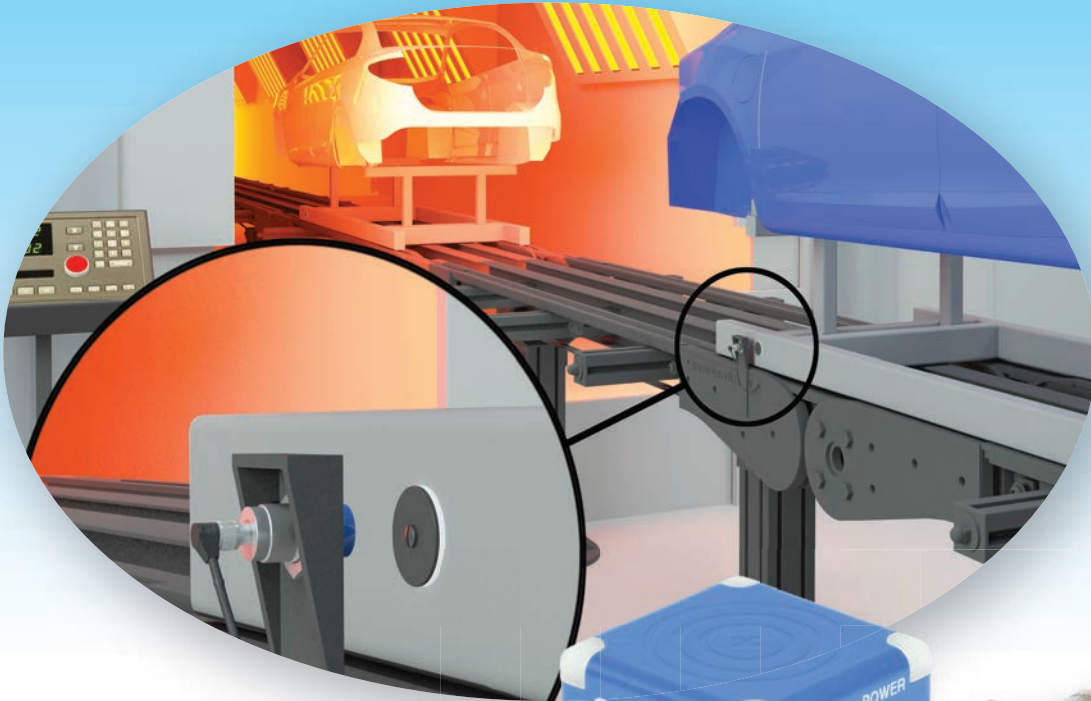


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Material Handling/Logistics

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MATERIAL HANDLING SOLUTIONS



As we head into the final quarter of a year that has been characterized – in part – by worker shortages, it may be helpful to examine “quiet quitting.” The notion that a certain subset of employees, especially younger ones, will do the jobs they are paid to do but *not* go above and beyond has captured the public imagination. People are greeting it with both alarm and approval. Are younger workers simply lazy? Do they want to collect a paycheck without exerting much effort? Or, is the work/life balance they seek better

than the wait-until-retirement-to-relax model that many Americans have to follow. Is quiet quitting actually a movement, or just a trendy phrase that the media has latched onto and amplified, with relish. If it is real, will it be a lasting approach to work in the U.S. or a temporary one that has emerged as yet another consequence of the pandemic?

And speaking of the pandemic, I read recently that part of the current worker shortage is due to long Covid. People who survived it but still suffer from fatigue and other symptoms are unable to re-enter the workplace. That accounts, according to some estimates, to two to four percent of the workforce.

What of those who *are* able to work? Are older workers who still embrace that much ballyhooed American work ethic to be considered dinosaurs, headed for extinction? If younger generations of employees choose to not work as hard, will that have far-reaching ramifications for productivity – and the U.S. economy? Work ethic is culturally specific. Americans have always been somewhere between the Japanese and the Europeans, or at least, some Europeans. Many people in Italy, France and other countries take the entire month of August as vacation time. That is possible, in part, because a minimum of four weeks of paid vacation is mandatory in the European Union. Many Americans have to work for a company for 20 years to even reach 20 vacation days a year. And then, being Americans, we don't use it all.

At the other end of the spectrum is the Japanese work ethic, which includes dedicating oneself to one's labors above all else, to prove that you are a hard worker. Sudden death due to overwork is so common that there is a term for it: *karoshi*. Many suicides and illnesses in Japan are due to work-related stress.

Do long vacations harm companies in Europe? Does excessive overtime make businesses in Japan more profitable? Will quiet quitting in the U.S. stress company owners and managers who are already struggling to maintain adequate workforces? I'm not an economist. I cannot answer these questions. Even the experts seem stumped as to what can be expected in terms of the long-term effects of quiet quitting. The actual scope of the movement remains unknown. Will the phrase vanish from the public lexicon in a few weeks, to be replaced by some newer, trendier topic? Or does quiet quitting have the kind of staying power that will transform the way Americans work?

We will have to wait and see. For my part, I will close this by referring to something that is *not* trendy, because it has been associated with the U.S. economy for a long time: resilience. *Workplace Material Handling & Safety* strives to help companies adapt and adjust to the changing times by bringing you up-to-date information each month. The information we provide is intended to bolster resilience and help you strengthen your operations. As always, your suggestions for how we can do that even better are welcome. Feel free to email me at maureenp@rdgmedia.com.



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Industry 4.0 and Material Handling Equipment

Forward-thinking companies are adopting sophisticated tools to keep their systems running without breakdown or interruption.

Contributed by: **MHI's Conveyors and Sortation Industry Group**

Everyone is familiar with the original industrial revolution, which took place in the early 19th century. It represented a sea change in how the western world manufactured products, becoming a society largely reliant on modern machinery for agriculture, mining and other industries. The second industrial revolution came not far on its predecessor's heels, ushering in electricity, railroads and better machines.

The third iteration of the industrial revolution is much more recent, having launched late in the 20th century and representing a much more digitally focused revolution. Computers entered the picture and traditional industrialization slowed down.

Today most observers would say we have entered the fourth industrial revolution. Its hallmarks include automation, data exchange, the internet of things (IoT), cloud computing, AI and other advanced technologies. Its impact is widespread, and the material handling world is right

at the center of all the fourth revolution is delivering. Welcome to industry 4.0.

MATERIAL HANDLING'S NEXT EVOLUTION

In the context of the material handling world, industry 4.0 represents a giant leap forward. Machines, devices, sensors and more are linked together, providing a complete picture of operational efficiency that allows end users to better predict and understand bottlenecks and inefficiencies.

This resultant energy efficiency equates to more eco-friendly material handling, says Dan Barrera, product manager at Bosch Rexroth. "When you're minimizing the amount of energy you're using, you're also delivering an eco-friendlier process," he explains. "The more efficient you are with your equipment, the less impact you have on the environment."

While this isn't necessarily the main driver behind companies' adoption of more modern and efficient equipment



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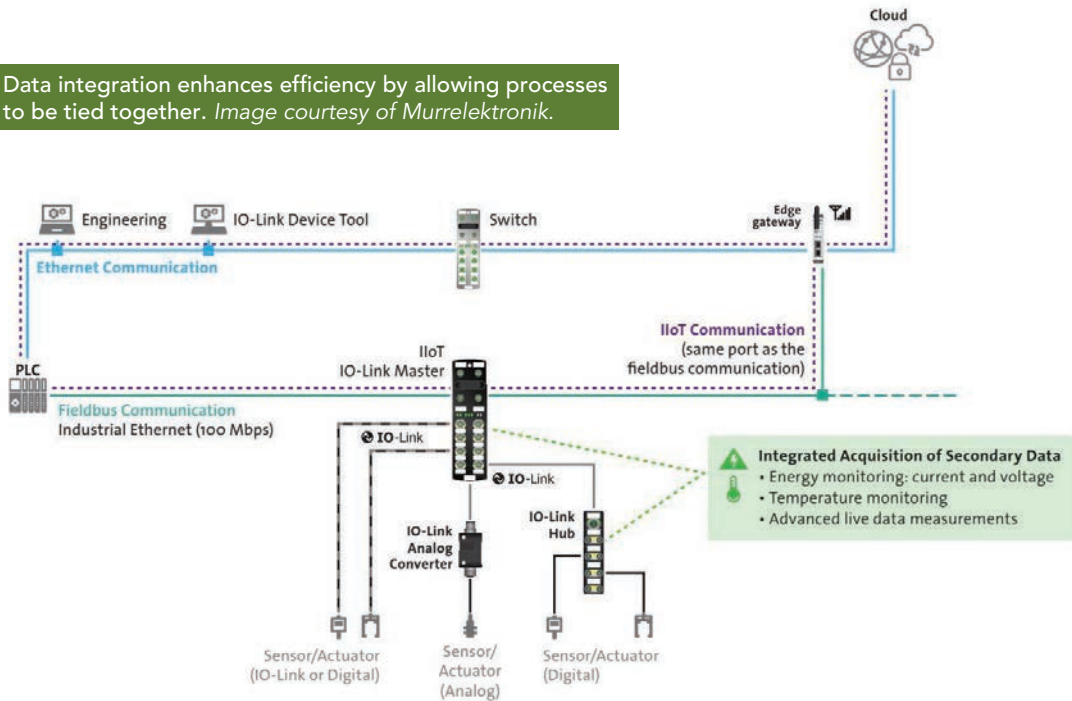
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Data integration enhances efficiency by allowing processes to be tied together. Image courtesy of Murrelektronik.



like conveyors and sortation devices, it's an important outcome that helps meet sustainability goals.

For most companies, the main driver in industry 4.0 is keeping production moving, says Barrera. "When productivity stops, you're losing money," he says. "So simple tools or functions that can help prevent that matter."

Those tools today look like conditioning monitoring and predictive maintenance. Both play vital roles in keeping conveyors, sortation systems and other material handling equipment ticking along at optimal speeds.

"Ideally, you're going to have data integration that allows processes to be tied together, working more efficiently," says Matt Clark, logistics account manager at Murrelektronik, Inc. "This looks like an intermediary device that talks to the controls and all the devices in a facility."

With edge devices, sensors, drives and controls—along with an intermediary device like that mentioned by Clark—you can constantly monitor whether your equipment is running as it should. This represents the first step in business transformation.

"To get there, you do have to invest upfront time and work into the system," explains Barrera. "You must teach your software that system A—say a conveyor—and system B—maybe a sortation system—should run a certain way. Then they can collect the data, crunch the numbers and give you an accurate picture of how they are running."

Clark says that the benefits at this stage include faster upscaling. "You don't have to reprogram each piece in your system," he says. "You can bring your system online

much faster, use less complex wiring devices, and receive data to automate decision making."

From here, you can move your systems into predictive maintenance mode. "Now the computer knows how your equipment should run and can monitor it to tell you when

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SORTATION TECHNOLOGY



While some companies are replacing conveyors and sortation equipment with robotics, there are still plenty of applications where conveyors are appropriate. Image courtesy of Murrelektronik.

maintenance is required,” says Barrera. “AI tells you where to look before something breaks down.”

For instance, if the bearings in your conveyor system are starting to show wear and tear, the software can inform you that they may cause trouble in the next few months. AI will point out the specific component, location or area where the problem might occur.

Currently, adopting predictive maintenance tools remains a near-future option for most companies. Conditioning monitoring, however, is beginning to reach a more common point of implementation. “You see a lot of adoption within big-box retailers and other companies with larger distribution centers,” says Barrera. “These companies want the analytics to make sure that production runs as it should, fixing problems before they happen and running as efficient as they can. These all translate into saving thousands of dollars.”

While in some cases, companies are moving to replace conveyors and sortation equipment with robotics like automated guided vehicles (AGVs) and autonomous mobile robots (AMRs). However, there are still plenty of applications where conveyors are appropriate, especially when coupled with advanced 4.0 tools. If you have high-capacity requirements, high daily sort times and low space requirements, conveyors and sortation—enhanced with modern 4.0 tools—remain a strong option. **WMHS**

MHI's Conveyors and Sortation Industry Group's mission is to promote the market growth, awareness and effective use of traditional and emerging conveyor/sortation technologies in manufacturing, warehousing, distribution within the supply chain. For more information, visit www.mhi.org/conv.

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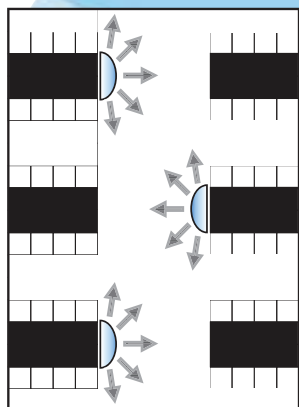
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What You Should Know About ASRS Safety

This modern-day equipment brings with it modern-day safety protections.

Contributed by: **MHI's AS/RS Industry Group**

There is no question that automated storage and retrieval systems (ASRS) have been one of the most considerable enhancements to the material handling world over the past decade. They can improve the speed of your operations, increasing throughput while improving consistency in your operations. They also remove some of the human pieces of the puzzle, which is critical during an unprecedented labor shortage.

ASRS is also a safe technology, in many ways enhancing the human safety element of material handling. That said, it is still sophisticated material handling equipment that requires vigilance by the operators.

Before adding an ASRS to your operation, it's essential to understand all the critical safety elements, both positive and negative.

THE SAFETY PROS OF ASRS

One of the best features of an ASRS on the human safety side of the equation is that it is very ergonomically friendly,

says David Phillips, marketing manager at Hanel Storage Systems. "OSHA talks a lot about the 'golden zone' of movement when it comes to the workplace," he says. "In general, that is movement that takes place within the shoulder to waist region."

When applied to warehousing, this means operating mid-level with regard to material handling. Some examples include avoiding bending down to pick up products off the bottom shelves, and/or staying away from lifting loads overhead to put or pick them off shelves. These movements require too much bending, lifting and reaching in ways that can make employees susceptible to injury, especially when practiced repeatedly.

An ASRS will take over for humans, keeping them safe from repetitive use and acute injuries. "When an employee gets hurt from repeating these movements over and over again, they often need to miss work," says Phillips. "That can get costly for the employer."



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The advantage of an ASRS in these situations, says Dustin Walker, executive account manager at SencorpWhite Systems, is that you bring products to the employees, not

the other way around. "Any time you can accomplish that, you'll have a huge benefit," Walker explains. "The employee needs to do less bending and reaching, less walking around the warehouse floor, and can be far more productive."



Like all moving equipment, an ASRS has factors that can make it potentially dangerous. Training can help personnel avoid hazards. Image courtesy of SencorpWhite.

When your facility includes ladders and mezzanines, an ASRS can make a big difference in this regard. "We always instruct to lift with legs, not the back, but it's easy for employees to forget about that," says Phillips. "So, they might pick up heavy items from the lower shelves and try to carry or lift them up to higher levels. This is especially dangerous if you're carrying items up to a mezzanine."

Again, ASRS can take over here, relieving workers of potentially injury-inducing movement. Current and potential employees appreciate the ease of operation with ASRS involvement, aiding in recruitment and retention.

Several safety features on an ASRS are incorporated into the design. "There are multiple redundant safety features," says Walker. "People and equipment shouldn't be moving in the same space, so these features prevent that."



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On older ASRS units, this usually looked like photo eyes, much like what you find on your garage door opener at home. “If someone or something crosses over the light beam, the ASRS will stop working,” Walker explains. “This also protected products from damage as well.”

On more recent versions of ASRS, the safety feature is usually a light curtain. This sits at the access point to an ASRS, and whatever it is bringing the product to the employee—whether an extractor, a robot, or a rotating carousel—is behind the curtain. If a body part crosses it, the machine shuts down, preventing the moving human/machine interaction.

Safety around an ASRS also involves training. “Whenever we install an ASRS, we hold a training session with the staff on the day of commissioning,” says Walker. “And there is always an emergency stop button within reach, so we make sure staff understands where that is and how to use it.”

HAZARDS TO WATCH FOR

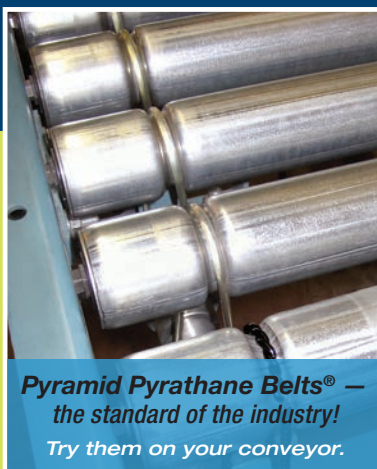
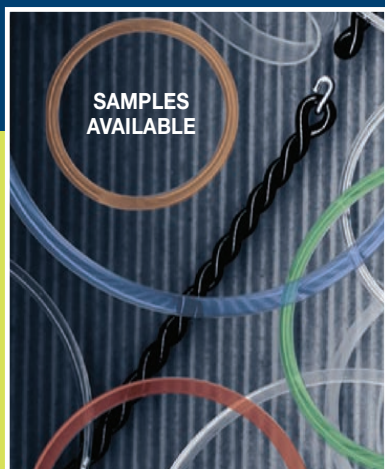
All moving equipment, like an ASRS, has factors that can make it potentially dangerous despite safety features. By training personnel on what to avoid, however, these are easily avoided.

The product’s packaging is the most significant potential hazard when operating an ASRS. Situations to avoid include instability—if packages are not stacked uniformly and cause instability of the loads within the ASRS, they can unbalance the load and cause an unsafe toppling. Pallets are also significant—improper loading can cause falling pallets, which can be dangerous to workers and the equipment. Breakages and/or loose nails also can wreak havoc in an ASRS, setting up for potentially hazardous working conditions.

In order to avoid any of these potentially dangerous scenarios, well-trained and attentive employees are your best defense with an ASRS. “In the end, an ASRS is going to be a far safer solution than manual handling,” says Phillips. “The equipment is going to guide employees in safe use and save a company money in the long run.” **WMHS**

MHI’s AS/RS Industry Group is comprised of leading suppliers of automated storage/retrieval systems. They supply systems worldwide and in virtually every major manufacturing and distribution sector. For information about ROI, case studies and the Automation Blog, visit www.mhi.org/as-rs.

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Carts and Casters: Performance, Safety and Ergonomics

Contributed by: **The Institute of Caster and Wheel Manufacturers (ICWM)**

A cart began as a two-wheeled vehicle, pulled by horses. Now, in every industry, as far as the eye can see, there are carts of all different types, for many different purposes.

From shopping carts at your favorite store, to carts carrying lifesaving equipment at a hospital, aerospace and automotive material handling carts, to the many types of carts used in the agriculture industry, and everywhere in between.

Casters consist of a “rig” (the housing for the wheel – typically a swivel or rigid rig), a wheel, a bearing in the wheel and at times accessories such as swivel locks, and a variety of types of brakes. There is no limit to the number of combinations of rigs, wheels and accessories available, which allows companies to complement and improve any type of cart.



Carts used by the grocery industry, among others, are becoming increasingly sophisticated in order to adapt to changing needs.

Casters are the single most important part of a cart when it comes to performance, safety and ergonomics. The wheel and bearing selection are critical when designing a cart. Defining the use of a cart is also critical when selecting casters. Will it be hand operated, towed, carrying heavy loads, or going over obstacles? These are just some of the key things to consider. Other important considerations would be determining if the casters need to have a brake,

so it doesn't move when not in use, or will the environment (weather, temperature, washdowns) be impacting the casters during their operation.

INDUSTRY-SPECIFIC CARTS

Each industry has its own particular needs and requirement for its carts. One example is in the grocery and retail industries. Alvar Diaz, ICWM Marketing Chair and VP Sales & Marketing, P&H Casters states, “with retailers shifting towards buy online with store pick up, the need for carts to deliver goods to vehicles becomes more sophisticated. Carts are now utilizing Central Braking Systems so that one pedal locks all wheels versus individually locking each wheel. This gives users more control when unloading goods.”

When walking into any health facility it becomes immediately clear that few industries use as many carts and casters as the medical industry. From the ER to the hospital room, and all of the laundry, food, monitoring and bio medical devices between them, everything is mobile, thanks to carts and casters.

Natacha Smith of TENTE states, “Medical carts are required to meet many different customer requirements and norms, such as rough handling tests. Examples of rough handling tests are driving down a step, going over a large threshold, or running into an obstacle. Casters typically take a lot of the abuse when these tests are performed, and the casters must be functional at the completion of these tests. These tests have been created to simulate real-life conditions, such as moving the cart, often containing high-end medical equipment, in and out of an elevator. Typically, medical carts require low pedal force, strong wheel brake and low noise. Caster selection has a huge impact on all of these requirements.”

In manufacturing and assembly plants, the use of a cart has changed drastically in the last 20 years. Up until the late 90s, heavy carts were towed, requiring high-capacity softer wheels, and lighter carts were hand pushed, using harder wheels to aid in ease of start motion. Scott Fisher, from the Colson Group, states, “the growth of lean manufacturing now requires carts to handle loads of 2,000-3,000 pounds, not only to stand up to the rigors of constant towing, but also requiring casters that allow for ergonomic ease of use when uncoupled for hand push operations.”

Caster types and wheel materials have also changed over the last few decades, allowing for a greater ability to specify the best caster for any requirement. Typically, there are good, better and best options for caster requirements, depending on the budget and performance needed for each cart project. Polyurethane and thermoplastic rubber are the most widely used materials. Manufacturers have the ability to tweak these materials to better meet the project requirements. Adding dissipative compounds can give a polyurethane anti-static feature for carts in electrostatic environments, as an example. Increasing or decreasing the shore hardness of these materials can also easily be done to better meet the requirements.

Ergonomics has become a key touchpoint when discussing carts and casters. Casters are the single most important factor in ergonomic improvement for any cart. The first three easy steps in improving ergonomics, or “decreasing the start force required” for a cart, are:

1. Increase the diameter of the wheel
2. Increase the hardness of the wheel if possible
3. Improve the bearing in the wheel.

Then, depending on the specification, there are different wheel materials that offer more resilience, aiding in ergonomics, different swivel sections that aid in decreasing the start force and even the shape of the wheel can make

a cart easier to start in motion. A caster specialist can help develop the right caster for your cart, whether it’s a new cart program, or you’re looking to replace casters on a legacy cart to more cost effectively improve ergonomics, increase capacity or simply make the cart last longer. **WMHS**

The Institute of Caster and Wheel Manufacturers (ICWM), an industry group of MHI, members are the industry’s leading suppliers of casters, wheels and industrial trailer trucks, platform trucks and towline trucks. They supply caster and wheel solutions worldwide and in virtually every major manufacturing and distribution sector. The association was formed in 1933.

With a simple vision statement of “Connecting the right casters and wheels to the right application,” ICWM has organized everything from a Casters 101 PDF, to a helpful application library, to an interactive document featuring ANSI ICWM: 2018 Vocabulary, Performance and Testing Requirements for Casters and Wheels.

Access the ANSI Standard and casters and Casters 101 guide here: <https://online.fliphtml5.com/bwarp/icqp/#p=1>

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Making Digital Connections to Improve Inventory Control

By: **Michael Kaufmann**, Contributor

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The global supply chain is evolving, with new challenges arising for inventory control operations. Many supply chain managers point to the seismic shift from B2B2C to B2C during the pandemic as the source of this change. Driven by this drastic change, the sheer number of parcels has increased a shocking 27 % since 2020. The good news for those tasked with inventory control is that technology has moved forward to meet the moment and prepare for the future.

Inventory managers are not alone. All supply chain executives have been taking a step back to holistically examine operations. They are looking to implement technology and processes that enable resilience to address not only the current landscape, but to be future proofed for the next set of challenges. It is inevitable that supply chains will increase in complexity as consumer expectations for speedy, accurate delivery continue to escalate. The challenges for inventory control specifically, will grow as well.

To alleviate supply chain pressures, and better manage inventory processes, the industry is moving toward solving these challenges through a digitally connected supply chain. While it may seem intuitive to connect each link, the unfortunate truth is that the supply chain has been built silo by silo over time. While it is obviously impossible to physically connect the points along the supply chain, it is possible to digitally connect them. A digitally connected supply chain will meet current and future challenges.

DIGITAL IDENTIFICATION AT SOURCE TO MANAGE INVENTORY

Call it the power of “one.” When a digital ID is given to each item at source, it has a ripple effect all the way across the supply chain to the end customer and impacts inventory management throughout. A digital ID is created at the manufacturing facility utilizing intelligent labels such

as RFID. An intelligent label houses the unique ID for the product that carries data and acts as a trigger for automation as that product moves through the supply chain.

Digital IDs on every product directly addresses the increasing volume and complexity of supply chain partners by allowing all operators to have full transparency on what is coming inbound and going outbound. The verification process is triggered by the digital ID at every touchpoint.

It is not a secret that a manual spot-check of inbound and outbound parcels is neither efficient nor accurate. On the flip side, by mass reading parcels, a pallet or truckload, a connected digital ID solution automatically spots the numerical difference and communicates the gap to the supplier. By digitally connecting products throughout the supply chain, retailers need not pay for items not received from suppliers.

The benefits in inventory control are clear for both the warehouse responsible for receiving orders and then sending them out, as well as the shippers who need to account for what comes into the trucks and what goes on the road. Further on, a retail store has accurate expectations for product count and arrival, enabling them to plan for operations from stocking to replenishment to promotions.

RFID AND DIGITAL IDS

The advantage of RFID is immediately evident in inventory control. People running around with clipboards and the errors that manual processes generate should be relegated to history. RFID accomplishes inventory control without a line of sight, much less a pencil and paper. Not only do intelligent labels allow operators to manage inventory faster and more accurately, data contained in the label flows through the entire ecosystem.

The objective of a digitally connected supply chain is to reduce the huge number of errors that happen across a multi-touchpoint supply chain and costs brands and retailers millions of dollars each year. Because inventory counts have been traditionally error prone with legacy manual processes, the cost benefits of RFID digital connections are significant.

Digital IDs created at source enable another essential attribute that aligns with inventory control: brand authentication. Although digital IDs can be assigned downstream, greater accuracy is achieved the further upstream the digital ID is created. Maintaining the chain of custody deters counterfeiting, tampering and entry of products into the gray market. There is also the issue of overproduction – a digital ID reveals where the unsold merchandise goes and how it gets there.

DIGITAL CONNECTIONS AND LABOR SHORTAGES

Current labor shortages in supply chain operations will continue. In response, there needs to be a technology edit, not a labor edit. A labor edit will not be the way of the future, not only because the future labor supply is an unknown, but it is not efficient. Adopting a connected environment and automating processes is the clear path ahead.

In the past, supply chain executives relied on labor intensive legacy technology for inventory control. Removing the burdens of legacy technology leads to automation that focuses on collecting information about a product and utilizing that data to automate supply chain processes.

With RFID labels, no line of sight is required so products can be scanned passively by deploying automated reading technology, such as a tunnel placed along a conveyor belt or an overhead reader placed above a dock door. Whatever type of label is utilized, the result is the same: a true inventory count of every item as it travels to each subsequent touchpoint on the supply chain.

Inventory control operations can benefit from digital connections forged across the supply chain. It's time to say goodbye to pens, paper and clipboards and manage inventory with all the tools that today's technology offers. **WMHS**

Michael Kaufmann is Global Market Development Director – Logistics, Avery Dennison Identification Solutions. Avery Dennison Corporation is a global materials science company specializing in the design and manufacture of a wide variety of labeling and functional materials, including radio frequency identification (RFID) solutions serving retail apparel and other markets (www.averydennison.com).



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Proper Bin Labeling Will Increase Productivity

By: **Maureen Paraventi**

Simple though they may be, heavy duty bins play an important role in warehouses and distribution centers. They are durable, waterproof, easy to clean and resistant to chemicals, all of which make them key players in storing, picking and inventory management. However, their usefulness may be limited if they are difficult to locate when they are needed. If employees cannot find what they are looking for, time is wasted, errors are made and orders aren't shipped on time. Labeling bins properly can enhance productivity and should be considered an essential part of supply chain efficiency. It enhances warehouse management by combining the simple (i.e., plastic bins) with the complex (IT technologies). Failure to pay attention to labeling best practices means that pickers will be hindered

in their ability to do their jobs effectively – and customer loyalty will be strained by delayed deliveries.

First, make sure you are using the types of bins appropriate for the items that must be stored or the fulfillment process being used. Stackable and nestable bins are good space-savers, because they can be nested when empty. They can sit on shelves or hang on rails, panels or carts. Shelf bins are placed on – you guessed it – shelving. Straight-wall containers hold a great deal of material, and can be stacked and palletized. Want bin contents to be visible or hidden? There are clear bins or bins with detached lids and lids that are permanently attached. Do you need to store more than one type of product? Choose a bin that can hold dividers. Bins with open hopper fronts make picking fast and easy.



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Having the right kinds of bins for the products, hardware, fasteners, parts, microchips, bulk items or whatever else is being stored is only part of the equation. Labeling those bins will ensure that the items are accessible. It is also important to have the right types of labels. For instance, the ever-increasing need to maximize space means that shelving is going skyward. If there are stock locations in your warehouse that are hard to reach, long-range labels may be the solution. They can be scanned from up to 45 feet away. There are also removable labels, which give you the flexibility to make changes as bin contents change. Retro-reflective labels with microscopic glass beads take barcode scanning to the next level and make it faster and more accurate.

LABELING BASICS

- It may seem common sense, but it's worth noting: make sure the bin is clean, because labels won't stick to bins that are covered in dust.
- Use high-quality labels that are made of durable materials and use strong adhesives. A label is no good if it has fallen off a bin and is sitting on the floor.
- Don't just order one label per bin if you want to be able to capture data from various angles. Whether you are ordering labels or printing them on site, have enough duplicates for as many sides of the bin as you need labeled.
- Use labels that are durable enough to withstand the environment in which they'll be used and still be readable. Laminated labels are a good choice for bins that are exposed to extreme conditions.
- Label designs should be simple, large enough to hold the necessary information and easy to read. Crowding symbols and codes into a too-small label will not facilitate scanning.
- Labels should include both a barcode image, which enables employees using barcode scanners to locate inventory quickly. Handheld scanners are useful especially spacious buildings, because of their portability.
- Labels should also feature letters and numbers that can be read by people. Color coding can provide a quick way to identify contents, as long as it is used consistently throughout a facility. Consistency should also apply to where labels are located on bins. Having labels all in the same place, such as the upper right corner of a bin, will help employees locate them faster.
- License Plate Number (LPN) labels with unique reference numbers are a good choice when a lot of information is required on labels, such as order status, shipping destination and hazard alerts related to the bin's contents. A high-quality scanner must be used to read it, but the label data will be captured quickly, no matter how extensive it is.

Whether the bins in your facility are used on shelving racks or pallet racks, for storage or shipping – or both – labeling them correctly will help increase and maintain productivity. **WMHS**

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Three Questions to Ask Your Propane Supplier

How working with a propane supplier can ensure success with propane forklifts.

By: **Jeremy Wishart**, Contributor

For more than half a century, propane forklifts have been used in manufacturing facilities and warehousing operations across the world. The equipment has been a mainstay in the industry for its low fuel and operating costs, 100 % reliable power, and its versatility for indoor and outdoor use.

propane isn't a one-size-fits-all solution. There are many convenient refueling options for propane forklifts, but perhaps the most widely utilized are cylinder exchange programs and on-site refueling.

With a cylinder exchange program, propane cylinders are typically stored in a cage in a well-ventilated space, either inside or outside a company's facilities. A propane supplier will exchange empty cylinders with full ones, providing an easy, grab-and-go system for employees.

For companies with very large operations, or those that prefer to handle refueling internally, a propane supplier will typically install propane fueling infrastructure on site. Propane fueling infrastructure is very similar to gasoline and diesel, with fuel stored in above-ground tanks, ranging from 1,000-30,000 gallons. A propane supplier can also recommend how many propane cylinders should be stored on site

and how often the supplier should come by to exchange the cylinders—ensuring a company never has to worry about not having fuel.

A major benefit of propane's refueling systems is that, once one propane cylinder is emptied, an employee can simply swap it out with a full cylinder and get right back to work. There's no refueling downtime. One propane cylinder typically lasts an entire eight-hour shift, giving companies uninterrupted operational capability.

Another advantage to propane refueling is that an investment in propane cylinders and storage cages can last decades. Beyond the initial equipment purchase and cost of fuel, companies are only responsible for buying and storing the cylinders—which can last up to 27 years of use—three times as long as the average forklift battery. Additionally, companies may be able to lease propane cylinders and storage cages from their propane supplier.

Finally, companies may also be able to lock in a fuel price with their local propane supplier, providing more financial peace of mind.



Propane forklifts are able to be used in indoor warehouses with proper ventilation, as well as in outdoor or cold-storage applications. (photo courtesy Propane Education & Research Council)

But, there's another reason propane forklifts remain a popular choice: the support of propane suppliers.

Propane suppliers are located across the U.S., so the fuel is available whether a company is located in a rural, suburban or urban community. In addition to helping companies get set up to run propane forklifts, propane suppliers act as a long-term partner. They can help make sure companies are maximizing their propane equipment, to receive the best return on investment. Companies that maintain strong relationships with their suppliers can see benefits for years from the partnership. Plus, many propane suppliers are privately-owned, family businesses with strong roots in the local community.

For material handling operations new to using propane forklifts, asking your propane supplier these three questions can help ensure success with the fuel.

QUESTION 1: WHAT ARE MY OPTIONS FOR PROPANE REFUELING?

Facility managers know that their operation is unique and unlike any other. Fortunately, refueling with

QUESTION 2: WHAT SAFETY MEASURES DOES MY COMPANY NEED TO TAKE TO ACCOMMODATE USING PROPANE FORKLIFTS?

Due to the nature of the equipment, forklifts introduce some workplace risks. Like any forklift, using best practices during operation greatly reduces the risk of workplace injury. But, outside of that, there are a couple of ways companies can work with their propane supplier to ensure safety when operating, storing and exchanging cylinders for propane-powered forklifts.

A propane supplier will work with a company to determine the best location for placing propane infrastructure; generally, the safest location for a propane cylinder storage rack or cage is located away from exits, stairways, entryways and high-traffic areas. The cylinders can be stored horizontally, with the pressure relief valves in the uppermost position. Operators should use proper lifting techniques when removing cylinders from storage and placing onto a forklift.

For operations where fueling needs are handled by the forklift operator or other internal staff, the propane supplier will provide training specific to the refueling process. The training will show operators the proper techniques for lifting cylinders and placing them on equipment safely, among other procedures. Additionally,



With a cylinder exchange program, a propane supplier will exchange empty cylinders with full ones, providing an easy, grab-and-go system for employees. (photo courtesy Propane Education & Research Council)

each time propane cylinders are exchanged, a propane supplier will inspect them and remove any with damage or excessive wear, ensuring continued safety for employees and equipment.

AN ESSENTIAL PART OF YOUR FIRE PROTECTION SYSTEM

Fire Barriers

Today's warehouse fire protection systems include more than just pipes and sprinklers. When the products being stored include highly flammable items such as plastics, aerosols, liquors or oils, fire codes may require fire barriers inside the racking structure.

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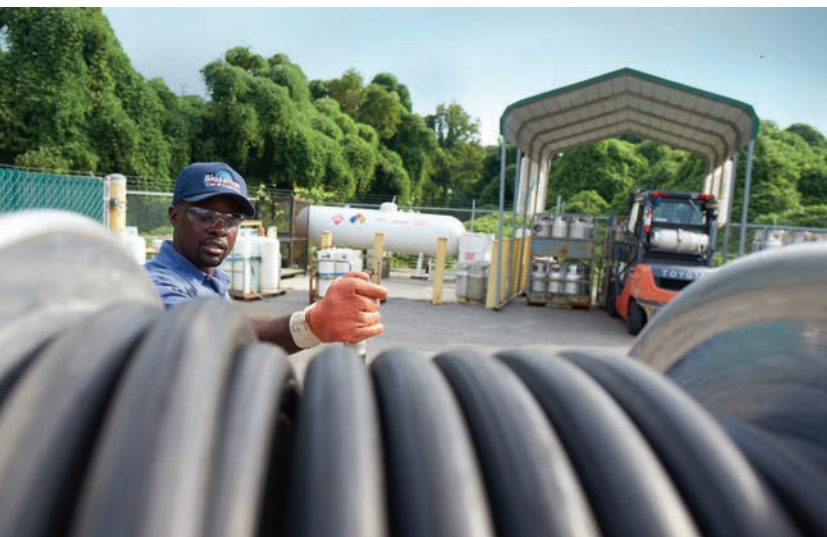
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Setting up a relationship with a propane supplier can ensure long-term benefits for companies; they can provide consistent refueling, regular training for employees and safe refueling equipment. (photo courtesy Propane Education & Research Council)

Propane forklifts are also able to be used in indoor warehouses with proper ventilation, as well as in outdoor or cold-storage applications. Propane produces far fewer carbon monoxide emissions than diesel-powered forklifts and are rated to withstand dust, debris and liquid from outdoor use. By working with a propane supplier,

companies can check that all ventilation meets federal safety requirements.

And that's it. Unlike electric forklifts, there are no additional electrical hazards or heavy batteries to worry about. Propane is also nontoxic, unlike diesel, which requires downtime to clean up and dispose of safely.

QUESTION 3: HOW CAN PROPANE HELP MY COMPANY'S LOW-EMISSIONS EFFORTS?

For companies that want to reduce their carbon footprint, propane is a great solution that offers benefits beyond simply reducing emissions. For example, propane is classified as an approved clean alternative fuel under the Clean Air Act of 1990, and its use in forklifts is eligible for alternative fuel rebates. By talking to a propane supplier, companies may be able to learn more about applying for these rebates or if additional

local incentives are available for propane use.

A propane supplier can also let companies in on new innovations and insights on propane and forklift technology, such as the results from a recent emissions study done by the Propane Education & Research Council

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in partnership with the Gas Technology Institute. The study, which was conducted from 2016-2019, revealed that propane forklifts had an edge over gasoline, diesel and electric equipment.

Another innovation for companies to watch is the increasing possibility of renewable propane: a byproduct of the renewable diesel and jet fuel production process which converts plant and vegetable oils, waste greases and animal fat into fuel. The fuel is carbon-neutral at the point of combustion, meaning no new carbon is added to the atmosphere when renewable propane is burned.

Setting up a relationship with a propane supplier can ensure long-term benefits for companies using propane forklifts, as they can provide consistent refueling, regular training for employees and eyes on safe refueling equipment. Additionally, propane suppliers can keep companies apprised of new opportunities and advances in the industry. **WMHS**

Jeremy Wishart is Director of Off-road Business Development for the Propane Education & Research Council. He can be reached at jeremy.wishart@propane.com. For more information about propane forklifts, visit Propane.com/Propane-Products/Forklifts.

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Time to Change: Millennials and Gen Z Are Distracted at Work

Eight “Heads-Down” Best Methods to Deliver New Programs.

By: **James Strohecker**, Contributor

More than one in three – 56 million – workers today in the U.S. is a millennial. They are currently the largest working generation.¹

Not surprisingly, Millennials (age 26-41) and Gen Zers (age 10-25) are more tuned to their devices and likely to be “heads-down” in and around a worksite, staring at their phones. OSHA requires employers to provide training to workers who face hazards on the job, but training Millennials and Gen Zers requires some special considerations.

THE WORKPLACE SAFETY CHALLENGE

Walking and texting led to more than 11,000 injuries last year. In one study, 60 % of walkers veered off course when they were texting. The Centers for Disease Control and Prevention reports that younger workers are more likely to be injured on the job than older adults. Meanwhile, more than 64 % of 13-34-year-olds say their smartphone is the one device they own that they can’t live without.

This fact can also be correlated to less job experience, lack of training and more demand for immediate workers in a busy warehouse / dangerous work environment.

WHAT THIS MEANS FOR SAFETY MANAGERS

Safety is Important to Millennials and Gen Zers: According to the American Psychological Association, Millennials reported that personal safety is a leading cause of stress in the workplace, and they are more concerned about personal safety than any other generation in the workplace.

Also, younger workers view workplaces that utilize modern technology as more efficient, environmentally friendly, flexible and collaborative. They are looking for evidence that companies are committed to safety. And they want clear evidence that their company has a culture of safety, and want to know what their employer is doing to keep them safe.

- Young workers want support, appreciation and to feel as though their efforts and contributions make a difference.
- This new, growing workforce wants feedback, reassurance and to feel as though their upper management notices them and is invested in their career.
- Both Gen Zers and Millennials are used to having immediate, easy widespread access to information whenever and wherever. They’re used to sharing their

thoughts and opinions, engagement and being part of the conversation.

- Safety professionals must create better training, work environments and regular workplace safety updates that are learned, shared and applied by Millennials.



Floor markings can effectively communicate warnings meant to keep workers safe. Image courtesy of Graphic Products.

CREATING “HEADS-DOWN” WORKFORCE SAFETY SOLUTIONS

How should safety managers address these changes and prevent high incident rates?

1. Upgrade your Safety Training - Make safety a team effort. Your employees will want to know what safety precautions are in place and how to respond in the event of an emergency. Be transparent about your safety culture and how you protect employees.
2. Make it digitally available - Make safety accessible anywhere. Spread your safety tips for warehouse employees through posters, email, texts and PA announcements. Use multiple platforms.
3. Motivations are different with the new workers. As a result, your compliance motivation must mean something. You can’t motivate people by offering them a reward or a punishment threat they don’t care about.
4. Train and encourage supervisory personnel to give encouragement, positive feedback and other “feel good” type reinforcements.
5. Give workers the opportunity to come in late or leave early as a reward for high performance. If performing part of their job remotely is an option, consider that.

¹ Millennials are largest generation in the U.S. labor force | Pew Research Center

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Millennial: born between 1980-1995	Gen Z: born between 1996-mid 2000s
80 million Millennials	90 million Gen Zers
Will represent 75 % of the global workforce by 2025.	Makes up 25 % of the population.
Are the first generation to grow up with the Internet and digital technology, quicker pace and online life.	Are the first generation to grow up with the Internet and digital technology, quicker pace and online life.
Check their phone 150 times per day.	Expect connectivity, global info, on-demand video.
Tend to be head-down at a worksite. Spend more time looking at their phones than any other generation.	Experienced with full sight, sound and motion over social and sharing apps. Can balance online and offline workplace communications.
Rarely go more than five hours without checking their phone.	Seventy-four percent prefer to communicate face-to-face with colleagues.
Sometimes take longer to learn and understand how to use internet tools and social media.	Have an intuitive understanding of how to use the internet and social media.
Pioneered many digital tools (texting, instant messaging that increase workplace efficiency.	More interested in tested, well-established channels that can create security and success.

6. Provide new responsibilities, new skill/job training or leadership opportunities – such as leading safety meetings and contributing ideas to management.
7. Consider creating baby step promotional titles, roles, peer groups or job responsibilities to encourage the feeling that young workers are being recognized and promoted for high performance.

8. If you want your safety tips to be heard by the new generations, communicate and educate in ways that resonate with them:
 - Discuss expectations.
 - Treat them with respect. Ask for their opinions.
 - Keep it short, concise, frequent and current.
 - Use multiple digital platforms.
 - Encourage their involvement: Let them teach.

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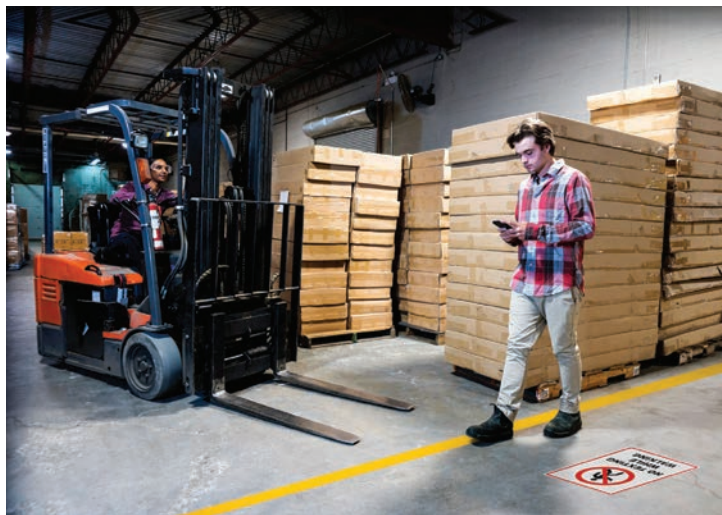
- Provide opportunities to collaborate.
- Offer guidance and growth opportunities.
- Rely on floor marking warnings to communicate effectively
- Apply simple, repetitive, infographic-type signage and visual communication.

SUMMARY

The warehouse and worksite culture are changing before our eyes. New workers are creating both increased expectations and new methods to reduce/eliminate incidents and increase worksite knowledge.

Safety management, risk avoidance and safety training must adjust and align closely with the new learning and teaching methods that have been embraced by the younger workforce. Companies with a firm understanding of the expectations of the new generations will be well-equipped to attract the next generation of talent and maximize their workplace capabilities.

Young workers want to know that safety is a workplace priority. When you create updated, modernized safety training programs and focused safety tips for your new younger workforce, your operation will yield immediate and long-term benefits. And at the same time, you can strengthen your entire workplace safety culture. **WMHS**



Walking and texting led to more than 11,000 injuries last year. Image courtesy of Graphic Products.

James Strohecker is the Director of Marketing Innovation at Graphic Products + DuraLabel (www.graphicproducts.com). Graphic Products is a leader in delivering innovative design software, industrial sign and label printers, all-purpose floor marking, multi-language signs and labels, and colored pipe markers for any facility's compliance and safety requirements. Learn how to create safety signs that meet OSHA requirements with the Best Practice Guide to OSHA Safety Signs. This helpful guide breaks down all the requirements, from text size to color and graphics.

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Supplying Flashlights and Proper Lighting is Critical for Worker Safety

By: **Jane Marsh**, Contributor



Worker safety is – or should be – a top priority in the warehousing and distribution center space. Thankfully, modern sites are safer than ever thanks to new technologies and safety tools, including personal protective equipment (PPE).

For example, gloves, earplugs, eye protection, foot guards and the classic hard hat are critical types of PPE workers must wear to reduce the risk of physical injury, especially those that could be life-threatening. However, some companies fail to supply their employees with one essential safety element: the appropriate amount of lighting.

In this article, I will discuss proper lighting in industrial workspaces and how it can impact employee safety. It can have a significant impact on morale and productivity.

LIGHTING AND WORKER SAFETY

Any worker that performs physically demanding tasks in an industrial setting recognizes the importance of safety. Likewise, companies and managers often spend a lot of time and effort equipping and training employees on various types of PPE and safety procedures.

It might be unintentional, but even the most seasoned safety managers could overlook the importance of proper lighting and providing workers with sufficient products. Still, work areas with poor lighting can lead to reduced visibility, threatening the safety of workers and those around them.

The lack of ample lighting makes it increasingly challenging for people to spot potential hazards, which could increase their risk of injuries. For example, employees handling hazardous chemicals or power tools in a low-light setting could use them incorrectly, misread labels or risk other workers' safety.

Other problems can occur as a result of improper lighting systems, such as:

- Glare
- Flickering lights
- Poorly distributed light
- Improper contrast

Poor lighting can impact the quality of work, especially in terms of tasks that require precision. It can also cause workers to suffer from eye discomfort, strain and headaches. Therefore, every industrial workplace should supply workers with task- and environment-appropriate lighting products to keep them safe and out of harm's way.

POTENTIAL LIGHTING PRODUCTS TO KEEP WORKERS SAFE

Companies can keep workers safe and save on equipment costs simultaneously with today's modern lighting technologies, such as LEDs. For example, LED lights can last anywhere from six to 12 years before needing to be replaced, so safety managers can avoid using up their limited PPE budgets on frequent replacements.

Another example is using new and improved flashlights, especially in confined spaces. Some flashlights rely on USB rechargeable batteries, while others are powered by solar energy, the most prominent renewable energy source on the market.

Most people associate solar power with panels installed on residential or commercial roofs. These are growing more popular, but other solar energy lighting solutions are increasingly used in the industrial sector.

Popular brands of commercial solar lighting products include:

- Wanco Inc.
- SEPSCO Solar
- Luxman Light
- Sol by Sunna Design
- Solar Illuminations

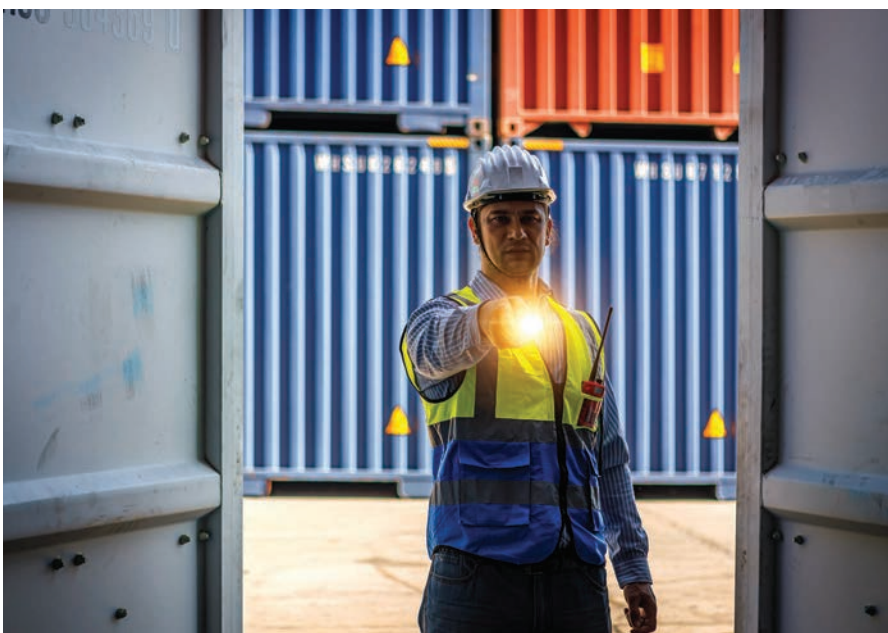
There's a strong business case to make regarding worker safety. According to OSHA, employers often notice higher productivity levels and increased profitability after implementing positive, effective safety measures.

However, more injuries could occur if companies fail to equip workers with proper safety equipment, including lighting products. Injuries can lead to increased absenteeism rates, which results in higher costs for the organization.

IMPROVE WORKER SAFETY WITH APPROPRIATE LIGHTING

The importance of proper lighting to ensure worker safety cannot be overstated. Companies should supply workers with the necessary equipment, so no one is injured due to poor lighting. Investments in this area can result in higher productivity because workers can see what they're doing and perform their jobs with confidence. This will lead to happier employees who don't have to worry so much about being hurt and work and much more confidence in their employers. **WMHS**

Jane Marsh covers topics in green technology and manufacturing. She also works as the Editor-in-Chief of environment.co. For information about renewable energy and energy usage, visit: <https://environment.co/renewable-energy-construction/>



Proper lighting can impact employee safety, morale and productivity. © JuYochi - stock.adobe.com

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Supplying Headlamps as Critical PPE in Hazardous Environments

By supplying intrinsically safe lighting products, industrial facilities can significantly enhance worker safety throughout the plant without worrying about dangerous settings.

Contributed by: **Princeton Tec**

Industrial plants have a duty to protect employees by providing a safe work environment and Personal Protective Equipment (PPE) required for the job. However, despite various PPE options, many companies fail to supply or specify important lighting tools – namely headlamps. Unfortunately, the lack of suitable headlamps can lead to serious, even deadly accidents, in hazardous locations.

As a tool, headlamps are essential when hands-free lighting is required in low-light areas for a wide range of tasks, such as operating and maintaining machinery or assessing its condition. Headlamps are also necessary for safe, efficient personnel movement throughout the plant, particularly in confined or restricted spaces. At sites with flammable gases, vapors, liquids, materials or dusts on the premises or in the air, having a headlamp that does not generate a spark is critical.

However, despite meeting OSHA's definition of PPE, "equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses," headlamps are often not included in corporate budgets for PPE. As a result, workers may be left to purchase their own headlamps from industry supply or hardware stores. Unfortunately, if they overemphasize price and choose products that lack necessary options, the units may be unsafe to use for some tasks, settings or conditions throughout the plant. This could open the company to potential liability.

To protect personnel in any work environment and to defend against such liability, a growing number of industrial safety officers are including or specifying headlamps in the company budget, as PPE.

"It is safer for industrial plants to provide suitable headlamps upfront rather than leaving it up to employees to make their own purchases. However, department approval of only intrinsically safe product would handle the issue. Preventing even one serious injury, fire or explosion would pay for any implementation," says Scott Colarusso, General Manager and Co-Owner, All Hands Fire Equipment & Training, a Neptune City, NJ supplier of fire safety equipment to various industries.



Supplying workers with intrinsically safe headlamps protects them from hazards and their employers from potential liability in the case of an accident. Image courtesy of Princeton Tec.

When companies supply intrinsically safe headlamps, which are specifically designed not to be a source of ignition in hazardous zones, this protects workers wherever they need to go in the plant from serious, even potentially lethal accidents. Essentially, everyone is covered, and the chance of mishap eliminated.

"Without safety certified headlamps appropriate for the application, industrial facilities are exposed to potential liability if an incident occurs. By supplying workers with headlamps that are rated for any hazardous environment [that could be encountered in the plant], companies can prevent the problem," says Colarusso.

MANDATING GREATER SAFETY

At industrial worksites, headlamps enhance personnel safety and efficiency since wherever they look the lighting goes with them, leaving their hands free. With multiple beam modes, these devices are designed to be easily operable even when workers wear heavy gloves. Typically, the units are waterproof and chemically resistant, ready for use in rugged surroundings, which may include getting thrown into a truck toolbox or dropped. Still, the devices must provide ample light for a sufficient "burn time" to last an entire work shift without a change of batteries.

Across a range of industries, however, typical headlamps can be a dangerous source of ignition if workers unwittingly enter a hazardous area or are exposed to flammable materials or conditions.

Safety considerations are particularly important considering OSHA's recently issued standard for construction work in confined spaces (Subpart AA of 29 CFR 1926). The new standard recognizes that such spaces can present physical and atmospheric hazards that can be avoided if recognized and addressed prior to entry. It is designed to eliminate potentially deadly hazards by requiring employers to determine what kinds of spaces their workers are in; what hazards could be there; and how those hazards should be made safe (including the use of headlamps, flashlights and other lighting equipment that carry the proper safety ratings).

Therefore, in production, processing or maintenance settings where the environment is inherently volatile, headlamps should carry the proper certification for various classes, divisions and groups of materials. When a headlamp is rated for all these options, it essentially means it is certified as safe for use in most hazardous environments.

As one example in the industry, the intrinsically safe Vizz II headlamp by Princeton Tec, meets the requirements (Classes I, II, III; Divisions 1,2; and Groups A-G).

"Whether for OSHA, Zone 0 or state standards, intrinsically safe products like the Vizz II headlamp help industrial safety officials ensure that all the bases are covered. So, there is nothing from the lighting that could spark a potential fire or explosion in a work environment," says John Navarro, a purchasing agent for Bayville, NJ-based CWR Wholesale Distribution, a supplier to various industries including automotive, consumer electronics, oil and gas, and marine.

Because headlamps can be dropped or bumped in industrial settings, it is also important that the equipment is designed to reliably withstand rough handling.

In response, some manufacturers like Princeton Tec now make headlamps with durable thermoplastic material designed to withstand drops and rough handling including being thrown into a truck bed. The units not only provide up to 10 hours of light without a battery change but also have superior resistance to common, potentially dangerous, industrial chemicals and solvents.

The latest models also offer anti-static properties and safety features, such as a mechanical locking mechanism that requires a tool to open the battery compartment. This prevents users from inadvertently opening the battery housing in a hazardous environment, which could not only result in electric shock, but also potentially ignition or explosion.



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According to Navarro, among CWR Wholesale Distribution's wide range of industrial customers, the motivation for budgeting and supplying intrinsically safe headlamps and lighting as PPE is to prevent potential liability.

"With an intrinsically safe headlamp, you are meeting the standard and enabling employees to work in the safest possible conditions with the most up-to-date equipment," says Navarro. "Now the technology is at a better price point than it was five years ago. So, it is affordable for corporate safety budgets."

Many of Navarro's industrial customers are willing to spend a little more for higher rated, compliant, intrinsically safe headlamps.

"Our industrial customers want to know their plant personnel can safely use their intrinsically safe headlamps anywhere. Safety committees do not want to worry about where personnel may use the units, if it is safe to use under hazardous conditions," concludes Navarro.

While industrial manufacturing, processing and maintenance carries some inherent risk, industrial plants seeking to improve safety can do so by providing workers with ultra-safe headlamps that ensure compliance.



Headlamps are essential when hands-free lighting is required in low-light areas. Image courtesy of Princeton Tec.

So, as the need for industrial safety only grows along with stricter regulation, facilities will increasingly make headlamps a mandatory part of any PPE budget or safety program to minimize operational risk and liability. **WMHS**

Princeton Tec is a producer of ETL and UL-approved lighting products and manufactures headlamps that meet strict global safety requirements. For more information, call 1-800-257-9080, email questions@princetonotec.com or visit princetonotec.com.

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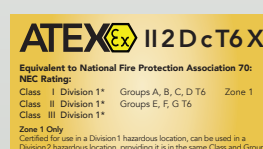
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Seven Considerations to Level Up Your Ladder Knowledge and Help Prevent Injuries

By: **Chad D. Lingerfelt**, Contributor

Time restraints and daily pressures can often lead to unsafe workplace practices. Investing in safety and following specific protocols is important for the company and everyone in the workplace – from employees in the manufacturing facilities, to distribution centers, to active jobsites.

According to the U.S. Bureau of Labor statistics, “there were 161 fatal work injuries from which ladders were the primary source in 2020¹.”

Because ladders are often a daily essential, it’s tempting for employees to not think twice about ladder use and the potential accidents that can happen. With the proper training and education, a serious accident can be prevented. The foundation of proper safety protocols begins with understanding how to correctly select the right ladder, only using the ladder as it was intended, and establishing a consistent and frequent inspection process before each use.

Before starting any new project, follow these seven steps to protect workers’ safety from any height.

1. CONSIDER THE APPLICATION & USE

One of the first steps in choosing the right equipment is understanding the type of ladder that will be needed for the job. From working on uneven ground, to working in tight spaces, to working around electricity, selecting the right ladder equipment will make the job easier and safer. From a stepladder, to an extension ladder, to a multi-position ladder, there are a variety of options. For example, the user may need a ladder with level-locking capabilities if working on uneven surfaces or stairs. And extension ladders can help with hard-to-reach spaces, but each comes with important guidelines that need to be followed. Ignoring the equipment limits and variances of specific ladder types can result in a fall or serious injury.

2. DETERMINE THE MAXIMUM REQUIRED HEIGHT

An important consideration while selecting the right type of ladder is understanding height, weight and maximum reach capabilities. Consider the height you’ll need to reach for the project at hand. For example, projects on the roof require ladders that extend three feet beyond the roofline. A LEANSAFE ladder can also be leaned against a wall or other surface if the project does not require roof access. Keep in mind that the highest standing level is four rungs down from the top of your extension ladder, and you must also take the overlap of the two sections into consideration

¹ <https://www.bls.gov/opub/ted/2022/fatal-injuries-from-ladders-down-in-2020-nonfatal-ladder-injuries-were-essentially-unchanged.htm>



Using the right type of ladder for a specific task will ensure the safety of the worker. Image courtesy of WernerCo.

when determining reach and ladder heights. Determining the appropriate ladder based on the maximum height of the project – not the maximum height of the ladder itself – will greatly improve safety.

3. UNDERSTAND LOAD CAPACITY – HOW MUCH WEIGHT WILL BE ON THE LADDER

Ladders are designed to safely hold a specific amount of weight. The “load capacity” is the maximum weight load recommended for safe use, which can range from 200 to 375 lbs. for residential use. For pro use the range is 300 to 375 lbs. Weight is one of the most important factors when selecting the grade of your ladder. Any materials that a worker is wearing, holding or carrying onto the ladder must be considered as well. For example, five gallons of paint weighs 60 lbs., so a person’s weight plus that 60 lbs. must be less than the ladder’s load capacity or duty rating.

4. CHOOSE THE BEST MATERIAL

Alongside load capacity, research the materials that will work best for the project. Ladders are typically made from fiberglass or aluminum, yet there are distinctive characteristics that can make one type more effective for the task at hand, depending on job requirements. If the user will be in contact with electrical wires or around certain chemicals, select a ladder made of fiberglass. This material is heat resistant, not conductive to electricity, and extremely sturdy. Aluminum is durable and it’s often the most common material choice, with its main advantage



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being its lighter weight, but job appropriateness should always guide selection. By following the manufacturer recommendations for weight and capacity, alongside project needs, either material can provide the right combination of strength, durability and safety.

5. STORE EQUIPMENT PROPERLY

Proper storage can be the determining factor between equipment longevity and serious safety concerns. To ensure a ladder maintains its integrity and durability for years to come, there are a few things that should be done:

- Keep the ladder clean and free of foreign materials
- Store ladders in weather-protected and well-ventilated areas
- Avoid moisture and excessive heat
- Pad storage racks with soft materials to reduce wear

6. INSPECT BEFORE CLIMBING

It’s important to inspect the ladder thoroughly before each use. Even if the user has taken all precautions by choosing the correct ladder safety can be compromised if the ladder isn’t inspected before climbing. A few important items to consider:

- **Missing Parts:** Inspect for damaged or missing parts before each use.
- **Steps:** Inspect each step of the ladder to search for cracks in the material, looseness between the step and the body of the ladder, missing pieces of hardware or any missing steps. Never use a ladder with missing or damaged parts.

- **Rails:** Inspect each rail of the ladder for cracks in the material, frayed rail shields or braces, which can be indicators of compromised stability.
- **Labels:** Labels should be legible and will often list important user information, such as the load capacity for the climber and their materials, directions for climbing safely, as well as any compliances with OSHA or ANSI.
- **Material Quality:** Ensure the ladder’s material is in good condition. Check for corrosion, rusting or any loose parts, which can pose a danger to the user if left unchecked.
- **Hardware:** Check to see that all bracing, shoes and rivets on the ladder are uniform and securely placed.
- **Repair:** Never repair a damaged ladder without permission from the manufacturer.
- **Exposure:** Replace the ladder completely if it is exposed to excessive heat or any corrosive agent. This can cause changes in the fiberglass strength and can sometimes be seen in the appearance of the fibers, color shift and loss of glossiness.

7. USE COMMON SENSE

When it comes down to it, using common sense in regard to climbing equipment is the key to avoiding small, yet costly, mistakes. Don’t take your ladder for granted. While it may seem like common sense, reviewing these best practices for the “right” and “wrong” way to use a ladder can prevent injuries.

With these seven important steps, a proactive approach to height safety and best practices can be taken. Because

falls are one of the most common causes of fatalities in the building and construction industry, maintaining strict standards for safety and protection can prevent a worst-case scenario. **WMHS**

The “RIGHT” Way	The “WRONG” Way
<ul style="list-style-type: none">• Wear non-slip shoes while using a ladder.• Follow safety instructions and warnings.• Ensure the ladder or step stool is on a firm, level surface, the ladder is fully open and the spreaders are locked.• Maintain a firm grip on the ladder, keeping the body center and waist between the rails.• Do not take shortcuts when climbing up or down. Face the ladder and set one foot before moving the other.• Ask someone to be a partner and hold the ladder at the bottom for added security.• Do not move materials quickly and put balance at risk.	<ul style="list-style-type: none">• Don’t stand above the second step from the top of a stepladder or the fourth rung from the top of an extension ladder.• Don’t climb a ladder if not physically and mentally up to the task.• Be careful of the placement of an extension ladder. Do not place the base too close or too far from the building or structure.• Don’t overreach or lean to one side.• Don’t move the ladder while standing or climbing on it. If the ladder needs to be repositioned, climb down before attempting to move it.• Don’t exceed the maximum weight capacity of a ladder.• DO NOT permit more than one person on an extension ladder.

Chad D. Lingerfelt is the national safety training manager at WernerCo. All Werner ladders and climbing equipment meet or exceed applicable OSHA and ANSI codes and stands for strength and structural integrity. Werner applies new regulations, codes and testing metrics to provide best-in-class training models for a variety of industries and companies of all sizes. To learn more about climbing safety and for each job type, visit www.wernerco.com. For any training related questions, please send an email to enduserspecialists@wernerco.com.

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Warehouse Safety:

Protecting People, Equipment and Productivity

By: **John P. Clark**, Contributor

A range of essential industrial safety products can safeguard distribution centers from collision-caused injuries, rack damage and reduced productivity.

Warehouse and distribution center efficiency and productivity has risen tremendously in recent decades. However, the gains can be jeopardized by safety breakdowns that lead to personal injury, equipment and product damage. In facilities of any size, this includes costly vehicle impact to pallet racking, which can undermine necessary storage and product throughput.

According to the Bureau of Labor Statistics, each year in the United States, nearly 100 workers are killed and another 20,000 are seriously injured in forklift-related incidents.

Efficiencies have been gained from better floor plans that allow for quicker throughput, from innovative racking solutions, and from robotics and other automation. At the same time, distribution facility employees are more productive than ever. Nevertheless, without the proper industrial safety products and approaches, collisions involving personnel with forklifts, tow tractors and other vehicles can be serious, potentially leading to grievous injury, loss of life and litigation. Vehicle impact with facility equipment, structures and controls can also have severe consequences.

Racking, work platforms like mezzanines and modular offices inside distribution warehouses also need to be protected with barriers to forklift traffic, such as guardrails.

Badly damaged racking [from a vehicle collision] loaded with inventory could potentially collapse without

warning if not immediately unloaded, inspected and repaired. A forklift could also go right through the wall of an in-plant modular office inside a distribution warehouse.

Distribution center productivity can also be compromised if important equipment like racking, conveyors, electrical boxes and control panels are not properly protected with barriers from vehicle traffic. In many cases, critical components must be replaced after damage at a substantial cost along with lengthy lead times. With recent parts shortages and logistical delays, replacement could take several months or more, resulting in extended equipment downtime and lower warehouse productivity.

Fortunately, a well-designed and properly installed array of safety products, including guardrail, gates and accessories can greatly reduce such incidents and protect the facility's people, equipment and productivity.

In today's tight labor market, a proactive approach to safety can also pay off in hiring and employee retention.

Labor is in high demand now and people want to work in a safe environment. So, a company that shows that it prioritizes keeping its warehouse employees safe with visible barriers like engineered guardrails [to prevent vehicle-pedestrian collisions and rack/equipment damage] has an edge in labor retention.

OPTIMIZING SAFETY

In warehouses and distribution centers, collisions between forklifts or other vehicles and employees or visitors are a prime concern, so providing adequate protection is essential.

At a minimum, walkways and work areas around racking should be clearly defined. Lines painted on the floor can be helpful in promoting such separation. However, when no physical protection is provided, forklifts and other vehicles can cross over to the pedestrian side for reasons such as operator inattention/distraction or insufficient training.

A more comprehensive solution is to establish visual and physical barriers in the form of guardrails. The guardrails, made with 11-gauge steel, keep pedestrians in defined walkways and



A well-designed and properly installed array of safety products, including guardrail, gates and accessories, can greatly reduce incidents and protect the facility's people, equipment and productivity.

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vehicles along predetermined routes with protective barriers maintaining separation.

For heavy duty protection, three-ribbed guardrail is designed to withstand impacts from forklifts and other vehicles commonly operated in warehouses and distribution centers. The guardrail can be installed with a single rail or a double rail that offers a 42-inch-high barrier.

A medium-duty guardrail is usually a sufficient and more economical means to separate and protect people in workstations and walkways from light shop traffic. They have two ribs and can be installed at a single or triple rail height.

The guardrails also facilitate efficient traffic flow. When pedestrians are kept out of traffic lanes by guardrails, forklift operators can maintain their expected pace unimpeded, so overall efficiency is improved.

When easy employee access is needed, durable safety gates can be utilized where required. For greater flexibility of



Racking inside distribution warehouses need to be protected with barriers to forklift traffic, such as guardrails.

use, utilizing safety gates with post openings designed to accommodate an easy change in the swing direction of the gate. For added safety, sturdy steel springs should automatically close the gate after an employee uses it.

Guardrails can also be installed to protect a wide range of important equipment. This includes rack aisle ends, mezzanines/platforms, conveyor systems, machinery, mechanicals, electrical panels, building features and offices situated amid material handling or manufacturing operations. With racking systems and mezzanines protected, inventory stored on the structural equipment is also safeguarded.

Finally, pallet racks can be protected from one of the most likely sources of damage – forklifts – with a highly visible and effective rack protector. The protector's sections are anchored to the floor, nestling the uprights and standard footplates of the racking. With a low-profile design, this safety equipment is often used at intersections and along high traffic routes to preserve the rack that is most likely to be damaged.

As warehouse and distribution centers become larger and more efficient, it becomes even more important for operation managers to sufficiently protect the safety of their employees and equipment along with the facility's productivity. Those who proactively implement the proper safeguards, including guardrail and accessories, will profit for years to come. **WMHS**

John P. Clark is the Director of Marketing for Steel King Industries, Inc. (www.steelking.com), a designer and manufacturer of warehouse storage racks, pallet racks and material handling/safety products since 1970.

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Shutdown Turnaround Safety: Know the Biggest Risks and How to Avoid Them

By: **Rick Pedley**, Contributor

Every so often, you'll need to shut down your facility or worksite for maintenance, whether scheduled or not. Performing maintenance, renovations, refitting or removing equipment from service is necessary in continuing a smooth and safe operation.

Like every job, there are risks associated with shutdown and turnaround processes. Employers can make some particularly dangerous mistakes and decisions where these processes are concerned, so aim to avoid these risks by planning ahead and, at the very least, communicating with your workers as soon as the process is scheduled. Managing startup, shutdown and turnaround processes may be overwhelming if viewed as a single process, so consider tackling them through a series of smaller steps. Keep the following common risks in mind along with ways to best avoid them.

FAILING TO PREPARE

Don't show up to work on the day of a shutdown or turnaround without knowing what's going to happen. You should know ahead of time what equipment needs repair or replacement, and the tools and equipment to perform these tasks should be staged in advance. Establish worker responsibilities for the process, from the senior management ensuring that the processes are conducted and documented correctly to the workers performing the job. Figure out the project's scope, the logistics of performing the work, plan for unknowns and unprecedented changes,

and anything else that needs to be done before work can start up again.

TOO MANY COOKS IN THE KITCHEN

Despite everyone being trained on what to do during a shutdown, the only people who should be working on the site at the time of the shutdown or turnaround should be essential to the process. Having more people around during these processes creates more risk, especially if you're at a particularly hazardous step. The more people you have around, the more people can likely get hurt as the result of an accident. Minimize the risk by keeping everyone informed of what's happening and when it's taking place, and ensuring that only the essential personnel are on-site for the process.

SKIPPING IMPORTANT PROCESSES AND REQUIREMENTS

Bypassing safety devices or controls while you're troubleshooting is asking for problems, no matter where you are in the process. Ensuring safety starts at the training and screening level, with new worker orientation and contractor review. Review OSHA and local requirements for your job and ensure that they're fully enforced. Keep the lines of communication open as you're working to keep everyone on the same page. Ensure that all other equipment is inspected, maintained and in proper working order and that machinery is properly grounded to minimize risks. Use your lockout and tagout equipment properly.

PRIORITIZING TIME OVER SAFETY

From a productivity point of view, downtime can be hard on a business. It takes time to ensure that all of the processes are properly shut down, but it's only through grounding equipment and verifying that excess energy is released that one can properly perform the work while keeping workers safe. Don't rush through starting back up, either—a full inspection involves ensuring that everything and everyone is clear before work can resume. Avoid rushing or cutting corners, no matter the pressure or demand, in order to prevent workplace accidents and injuries and keep your equipment working properly.



A full inspection should be conducted before starting back up.

NOT DOCUMENTING PROCESSES AND CHANGES

Senior management is responsible for ensuring that written safety reviews are followed at every stage of the process. You'll need to review analyses of process hazards where necessary and keep them current, especially if your processes or equipment change in ways that require thinking about different hazards. A management of change analysis is also essential for equipment, processes and procedures that are different from what you had before.

Frequently review and revise your processes when necessary. If you've learned something new in your latest shutdown, something unprecedented happened with the new equipment during a turnaround, or some other oversight or discovery happens, writing it down ensures that other workers involved in the process are informed. Update your written records and processes and keep them accessible to everyone that's going to be doing the work.

There may be risks on the jobsite, and not properly performing a shutdown turnaround can be one of them. These potential complications can be dangerous, especially without adequate preparation and communication. While some risks can't be completely avoided, others can be planned around. Minimize your shutdown or turnaround risks by following your plans carefully and completely. **WMHS**

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