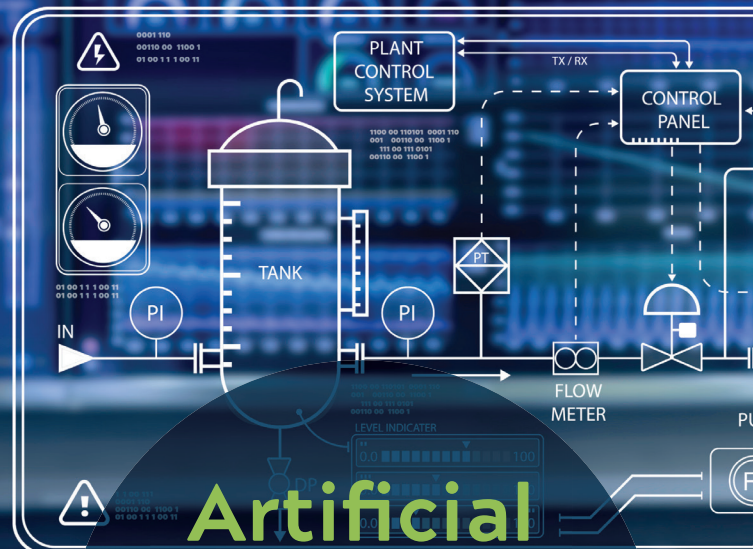
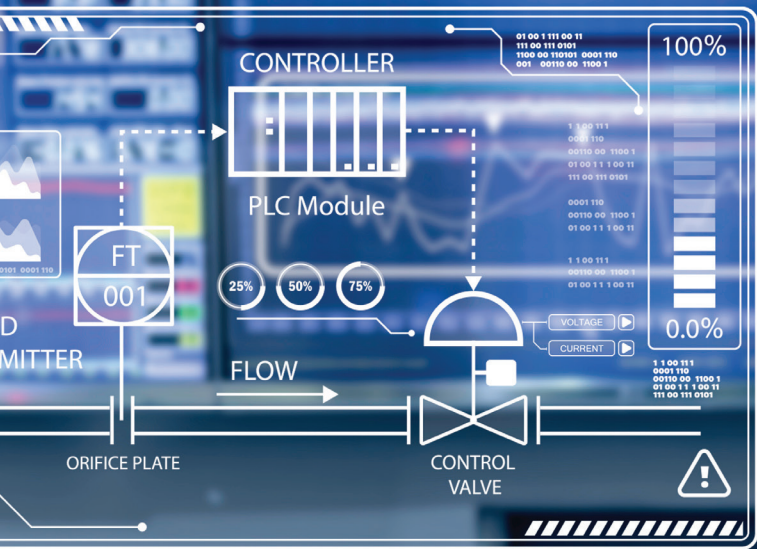


EFFICIENT PLANT

OPTIMIZING MANUFACTURING SYSTEMS



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Industrial vibration improves material flow and reduces the chance of injury. Photos courtesy Martin Engineering

feature | solution focus

Jerad Heitzler
Martin Engineering

Awareness, training, and equipment design are key to minimizing incidents.

Focus on Conveyor Safety

ACCORDING TO INDUSTRY expert R. Todd Swinderman, there are five root causes of conveyor injuries: a “production-first” culture, “low-bid” purchasing, overly complex designs, too many rules, and understaffed/undertrained personnel. He pointed out, “A survey of the literature shows that companies who truly focus on safety are more productive, operate cleaner and safer facilities than their competitors, and have a higher share price.”

“Reduced workplace injuries and fatalities is a positive trend, but there are still predictable and preventable injuries happening,” said Dan Marshall, Product Engineer at Martin Engineering, Neponset, IL. “The goal of our Production Done Safely philosophy is to help bulk handlers achieve the greatest amount of production at the lowest cost of operation with the least number of injuries possible. We accomplish that through awareness, extensive training, and safety-conscious equipment design.”

TRAINING EVERYONE

A common fatality involves a worker cleaning spillage around an operating conveyor

system. An example of this happened recently in New Jersey where a temporary non-union worker, cleaning around a moving conveyor, got too close to the moving belt and a piece of loose clothing met the belt, dragging him into a pinch point. He was strangled with the fabric before aid could be administered or the system shut down.

It was not revealed in the report how much training the individual had received, but a trained worker would have been aware of the hazards around a moving belt with regards to such items as loose-fitting clothing or long hair. Also, the presence of a buddy or supervisor is unknown, but using work teams might have allowed a faster response to shut off the system or free the worker before asphyxiation occurred.

UNSAFE HOPPER ENTRY

A worker with slightly more than a year of experience at a sand and gravel mine noticed a clog in the drop chute of a cone crusher. After entering the vessel to remove the obstruction, while he was inside, material that had built up on the sides fell inward,

encasing him up to his chest. Fire crews were able to extract him, but the injuries from the pressure and force of the material were too significant and he later died.

What was not revealed in the report was whether the worker was certified for confined-space entry. Knowledge of chute entry rules specifies safety procedures for these types of actions, including clearing all loose material, which would have likely prevented the worker from entering the hopper.

There are safe and economical accessories designed to mitigate obstructions in chutes, hoppers, bins, and silos. To prevent injuries and equipment damage associated with methods such as striking the sides of the vessel with mallets, stabbing at obstructions from below, or dangerous chute entry, equipment manufacturers offer vibration and air-cannon technologies.

CULTURE INVESTMENT

The importance of protecting workers should be the top priority for any employer. Investing in equipment and training that protects workers from injury and illness is essentially investing in the community

The OSHA “Safety Pays” online tool uses company-specific economic information to assess the potential economic impact of occupational injuries on that firm’s profitability.

<p>OSHA \$afety Pays Tool</p> <p>To calculate an accident’s impact on profitability, the company’s profit margin is used to determine the sales required to pay for the total cost.</p> <p>The results can be staggering.</p> <p>Presented by </p>	<p>Average Direct Costs \$56,557</p>	<p>The \$Safety Pays tool estimates the cost of a single crushing injury.</p> <hr/> <p>Assume that the company in this example has annual sales of \$10,000,000 with a 3 percent pre-tax profit margin.</p> <p>Input your company’s annual profits and the OSHA Safety Pays tool assesses the total cost of the injury.</p> <p>OSHA draws direct costs from claim cost estimates provided by the <i>National Council on Compensation Insurance</i>.</p> <p>Indirect costs are provided by the <i>Stanford University Department of Civil Engineering</i>.</p>
	<p>Average Indirect Costs \$62,212</p>	
	<p>Estimated Total Cost \$118,769</p>	
<p>Additional Sales Necessary:</p>		
	<p>To Cover Indirect Costs \$777,658</p>	
	<p>To Cover Total Costs \$1,484,612</p>	

and the company culture. In its 2002 white paper, the American Society of Safety Engineers [ASSE, now the American Society of Safety Professionals, Park Ridge, IL (assp.org)], concluded a direct, positive correlation between investment in Safety, Health, and Environment (SH&E) and its subsequent return on investment (ROI).

Direct costs are explicitly associated with the accident or illness. In general, these include fines, medical bills, insurance premiums, indemnity payments, and temporary disability payments.

Indirect costs include a variety of other expenses resulting from an incident and include:

- ▶ Purchase/installation of safety components
- ▶ Overtime to fill in for the missing worker
- ▶ Cost of hiring, training, and equipping new employees
- ▶ Legal fees and litigation costs
- ▶ Increased insurance premiums.

THE PRICE OF RECOVERY

“Tallying the direct and indirect costs, the impact of an accident on a company’s bottom line can be devastating,” said Marshall. “Safety rules aren’t maliciously created to complicate operations or limit profit. When taken into account, they actually improve a company’s bottom line.”

OSHA created the online tool, “Safety Pays,” which uses company-specific economic information to assess the potential economic impact of occupation-

al injuries on that firm’s profitability. The program estimates direct costs and indirect costs and weighs those costs against financial details supplied by the company.

“The problem with the ROI model is it requires someone to get hurt to provide a benchmark for calculating return, and that’s not a reasonable point of entry,” Marshall explained. “Using OSHA’s \$afety Pays tool to provide a cost model to calculate the Return On Prevention (ROP) is a far more practical approach.”

The ROP model expresses the direction and strength of occupational safety and health programs in helping to achieve company goals.

The death or injury of a worker in a conveyor accident is always tragic. Investigations usually reveal the incident could have been partially or entirely prevented with practical and cost-effective safety improvements. The ROP on durable, well-designed conveyor accessories and professional training not only makes good financial sense, but also produces a culture of safety that ripples throughout the company’s balance sheet. **EP**

Jerad Heitzler is Program Manager and Lead Instructor for Martin Engineering’s (Neponset, IL, martin-eng.com) FOUNDATIONS Training Workshops, focusing on how to make the handling of bulk materials cleaner, safer, and more productive. Under his leadership, the program has expanded worldwide.

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SCAN FOR MORE

Scan the code to learn more about conveyor safety.
<https://www.martin-eng.com>

