Safety Practices in High-Risk Industries

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Dangerous jobs challenge safety experts in extraordinary ways. Here's how professionals in some of the nation's most dangerous jobs keep the focus on safety in their daily routines.

Safety experts stress that accidents are not random occurrences. They happen for a reason, usually resulting from interactions among people, machines and their environments. Accidents are unplanned, unwanted, and nearly always preventable. They're also the leading cause of death for Americans under 45 years old, says the National Safety Council. Unfortunately, accidents are often the only signal that something is wrong and that an industry's standards must change.

According to the U.S. Bureau of Labor Statistics (BLS), all industries are not equal when it comes to worker risk. Meatpacking, auto building, shipbuilding and foundry work, for example, lead U.S. industry in deaths, injuries and illnesses. Workers in these and certain other industries (see chart) are exposed to serious on-the-job hazards virtually every day. In these environments, such exposure is often the nature of the beast: It can't be ignored, avoided or legislated away.

But it can be managed, which is what modern safety professionals in high-risk industries are trying to do. It's the toughest of all safety jobs because mistakes can be devastating. The Bhopal, India, pesticide-plant explosion in December 1984 generally considered the worst industrial accident ever is the most horrendous example, though not the only one. In Bhopal, 10,000 people were killed and another 300,000 were injured, most of whom lived in the shantytown next to the facility. The poor safety tactics of plant owner Union Carbide were revealed as the cause. According to studies of the event, a series of safety-mechanism failures allowed the release of a lethal cloud of methyl isocyanate (MIC) gas outside the plant after water was introduced possibly by a disgruntled employee into a tank of liquid MIC in the plant. Many of the safety features that could have prevented the disaster, including temperature and pressure indicators, temperature alarms, pressure controllers and safety valves, were inoperative. In several areas of the plant, there was no water spray protection and deficiencies in safety-valve and lockout procedures were recognizable. High turnover and accident rates, both in and outside the plant due to the escape of toxic gas, and cost-cutting by management compounded these problems.

If any one of the above safety mechanisms had been enabled, there may have been an indication or warning of what was about to occur. The runaway chemical reaction was set in motion when water entered the MIC tank resulted in a rapid rise in pressure and temperature. Corroded storage tanks supplied the iron catalyst that accelerated the release of the toxic gases. Incredibly, no alarms sounded. Emergency sirens had been switched off.

After Bhopal, chemical-factory management procedures were placed under intense scrutiny. "The chemical industry is so hazardous," says Ron Miller, director of training and consultant services at the National Safety Council, Itasca, IL, "that by sheer necessity it had to develop management systems that valued safety." The

industry now recognizes, he says, that safety and maintenance cannot lose priority in favor of cost cutting. When changes to a safety plan are made, the implications of those changes must be considered.

In response to the 10,000 people who lost their lives in Bhopal, the Emergency Planning and Community Right to Know Act of 1986 was passed. Companies must now provide public information about their potentially toxic chemicals, and states must establish Emergency Planning Districts and committees to prepare for an emergency. The Toxic Release Inventory has been expanded and the number of industrial facilities required to publicly report their levels of toxic chemical emissions has increased 30%.

Today you will not find chemical industries on the list of the 10 most dangerous jobs, in part, due to the lessons learned after Bhopal. On the other hand, some industries that were considered dangerous a century ago, are still considered so. Steel- and automaking, as well as meatpacking are jobs that, in many ways, are as tough and dangerous now as they were 75 years ago. In his 2001 book Fast Food Nation, author Eric Schlosser offers a sobering example of how rough a job on the floor of a meatpacking plant can be today.

Kenny Dobbins was hired by Monfort Beef Co. [Greeley, CO] in 1979, when he was 24. Over the next 16 years he blew out a disc and had back surgery, spent a month in the hospital after inhaling too much chlorine, damaged the rotator cuff in his left shoulder, broke a leg, shattered an ankle that had to be mended with four steel pins, and got more bruises and cuts, muscle pulls and strains than he could remember. In 1995 a plant nurse diagnosed a heart attack as a muscle pull and sent him home, where he nearly died. While awaiting compensation for his injuries, he was fired.

According to the BLS, meatpacking is today the most dangerous job in the U.S. Schlosser reports that about 40,000 meatpacking workers are injured on the job every year, which is considered a low estimate because many injuries go unreported. The industry's rate of serious injuries is five times the national average, while the rate of cumulative trauma injuries is 33 times the national average.

What makes jobs in meatpacking riskier? "The people who manage them," says Jim Forstman, president of DuPont Safety Resources, a Newark, DE-based consulting and training arm of the chemical maker. "If they don't have the knowledge to understand the job, they may implement procedural changes that could negatively impact the safety of the employees actually doing the job."

In addition, companies going through leadership changes, financial strains, and other organizational changes become particularly vulnerable to accidents. They can also occur when an industry is burdened by time pressures and product demands. In the meatpacking industry, for example, many plants work around the clock to meet the country's voracious demand for beef products. Schlosser reports that the typical line speed in an American slaughterhouse 25 years ago was about 175 cattle per hour. Today, some line speeds approach 400 cattle per hour. And while some of the work is automated, workers still must use hand-knives to prepare animal carcasses. This subjects them to both repetitive-motion (ergonomic) injury and to injuries from knife blades. While the industry's safety procedures are guided by both the Occupational Health and Safety Administration and the U.S. Department of Agriculture, cutbacks in government inspection programs mean there are more packers in operation than USDA or OSHA staff members can realistically visit.

From OSHA's perspective, an effective safety and health program for the

meatpacking industry must concentrate on ergonomic hazards to prevent cumulative trauma disorders, machine guarding to avoid direct contact with dangerous equipment, and training on the proper use of knives to prevent cuts. And some meatpackers say they're doing just that. According to Mark Klein, director of communications at Excel, a Kansas-based meatpacking unit of Minnesota-based food producer Cargill, Inc., proper management of these hazards has contributed to the decline of accidents at Excel by 20% between 1995 and 1999, and in the last few years, by 40%. Formalized efforts to better the conditions at the plants go back to 1987, he says, when Excel management voluntarily introduced ergonomic programs via formal contractual agreements with the union. Klein says the company uses a centralized safety program and ergonomic structure that includes a coordinator and full-time ergonomic monitors, selected among the union members who work on the line in the plant. The monitors work with an ergonomic committee that identifies ergonomic issues and ensures that workers voices on the issues are heard. "Work improvements come from the employee," says Klein. "We do not discourage workers from reporting accidents or bad conditions. We encourage them."

One Excel safety program, for example, empowers line workers to stop production if they see an unsafe practice. In addition, new hires are taught about ergonomic work methods, which include the care of steel knives, how to sharpen them, and how to trim the meat using the least amount of force. The training stresses that when a knife becomes dull, it causes more tension on tendons.

Hazards are altogether different in an industry like shipbuilding and repair. Most of the work is done outside. It's not repetitive like meatpacking. And it involves working with enormous pieces of metal. Fran Cohen, industrial hygienist at the Coast Guard Yard, a federal shipbuilding and repair facility in Baltimore, MD, says working with metal moving it, cutting it, grinding it, welding it, scraping it and painting it is the primary risk for shipyard workers. Employees are often required to work at heights or in confined spaces, she says, using cutting, welding and abrasive equipment.

The potential for cuts, burns, bruises and falls is high. As a result, "No one works alone," says Cohen. "If one worker is cutting, the other is standing behind him watching out." New workers getting used to the rigors of shipboard work often lead the injury list, says Cohen. Older workers get back and knee injuries because most jobs require a high level of physical activity.

The Coast Guard Yard's superior safety record no deaths since 1963; no serious accidents in more than three years is a result of its pro-active approach to safety. "We manage the system instead of fighting fires," says Cohen. "If we see a special need, we write a new procedure and provide the necessary training. We do this in addition to our monthly safety meetings."

In a cyclical business like shipbuilding, accident rates fluctuate, depending on work load, budgets, and, sometimes, worker experience. Such fluctuations can also lead to a Catch-22, says Cohen. "Our best results are no results," she says. "So if we have no injuries, that means we are doing a good job. But if no one is getting hurt, then why do you need us?" For this reason, safety has sometimes been one of the first places to get cut, she says, high-risk industry or not. Nonetheless, the Yard has been able to support and strengthen its focus on safety. "Years ago, four or five deaths in a year or two would be considered the cost of doing business," says Cohen. "Today, that is completely unacceptable. It is a fantasy to expect zero

accidents, but that is what we are shooting for."

E very workday, temperatures in the special aluminum caster facility at Wise Alloys, Muscle Shoals, AL, reach 1,300 degrees F. Workers at the plant, which makes cans from cast-aluminum sheets, face safety issues that include dealing with heat, heat transfer and direct contact with molten aluminum.

The process for making the cans is a delicate one. It includes casting an ingot and cooling it with the right amount of water. Too much water can cause an explosion. Hence, safety training has become integral to the success and longevity of the company. Wise Alloys provides a six-week, new-hire training process that outlines industry best practices and safety procedures.

According to Jim Herderhorst, safety and training manager, the entire program is custom-designed and created by the company. In addition to classroom instruction, new molten-aluminum operators spend hands-on training time at the caster to apply acquired knowledge in a controlled environment.

Wise's system is designed to protect workers before they get injured. Like the chemical industry, however, safety management has changed as a result of accidents. In 1966, eight employees were killed as a result of an explosion in a casting facility. According to Herderhorst, an inexperienced worker, in an attempt to stop a mold from bleeding molten aluminum, tried to plug it off. In the process, he allowed molten metal to seep into the water coolant, triggering the explosion. At the time, workers did not wear flame-retardant clothing.

Following this incident, procedures for plugging a mold were rewritten, protective clothing was required, and new equipment specs developed. Now, Wise requires operating personnel to wear an FR9 faceshield when servicing the aluminum, gloves, steel-toed shoes, and spats. They also wear a flame-retardant garment (FR9-B) while in the casting facility made of vinex. Should the aluminum splash on to the garment, the vinex reacts with the aluminum, seals itself and runs off. If the molten aluminum were to hit a cotton shirt, it would ignite immediately. "Safety, quality and production are the three components of our manufacturing process," says Herderhorst. "All are equally important. We do all three all day or the company suffers."

"T ragedies are tragic but tragedies are also expensive," says James Walsh, the California-based author of the book OSHA in the Real World. Consider Union Carbide, which was forever changed by the incident in Bhopal. Faced with more than $3 billion in lawsuits after the disaster, the company was forced to sell most of its assets. Today it employs less than 25% of its pre-Bhopal workforce (13,000 employees worldwide, down from 55,180), and operates as a subsidiary of one-time competitor, Dow Chemical.

Smart companies, says DuPont's Forstman, make the connection between safety and profitability and "follow what is important." Good safety practices mean lower injury rates, he says, which mean lower insurance and workmen's compensation costs. In addition, good safety practices enhance a company's public image, employee morale, product quality, security, productivity and sustainable improvement.

Walsh says the focus on safety has accelerated at all levels of industry, due in part to OSHA's voluntary compliance programs. "If you inspect yourself and participate in a voluntary OSHA program, the agency will not surprise-inspect you," he says. This simplified approach to safety has reduced both expensive and sometimes arbitrary penalties as well as an overall antagonistic feeling toward OSHA that

existed since its formation in 1970. He cautions, though, that self-scrutiny cannot be taken lightly or perceived as a safety shortcut. "You can't have cynicism in the safety program," he says. "Everyone has safety issues in the workplace. The question is to find how to address them and comply most economically."
The National Safety Council's Miller suggests that companies approach safety like quality control. Management puts in controls to achieve zero defects. Likewise, management should establish controls to achieve zero accidents. "Managing the process and measuring the right things is critical," he says. "A company can't measure just numbers, but has to also measure the process of improvement. If we continue to measure our failures, there will be no improvement." Most importantly, he says, safety is also a value, like honesty. And no one argues about how much honesty is acceptable.

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