

## X. REGULATIONS AT WORK: FIVE RULES THAT SAVE WORKERS' LIVES AND PROTECT THEIR HEALTH

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This chapter looks at five worker-safety regulations that were tremendously successful in reducing employee injuries, illnesses and fatalities without imposing undue costs.<sup>3</sup>

- A rule requiring the cotton industry to reduce dust in textile factories lowered the prevalence of brown lung among industry employees by 97 percent;
- A rule requiring employers to place locks and warning labels on powered equipment is credited with preventing 50,000 injuries and 120 fatalities per year;
- A rule on excavations at construction sites has reduced the fatality rate from cave-ins by 40 percent;
- A grain-handling facilities standard has reduced the number of fatalities caused by dust-related explosions by 95 percent;
- And a 1969 mine safety law led to a rapid 50 percent decrease in the coal mine fatality rate.

While some of these regulations were controversial at first, they now enjoy nearly universal approval of the industries they cover.

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### **Cotton Dust Standard Curbs Lung Disease**

Working with cotton fiber used to produce large quantities of dust, which textile workers inhaled continuously over the course of their careers. As early as 1705, doctors knew that inhaling cotton dust caused breathing problems in mill workers.<sup>4</sup> Scientists now understand that cotton dust contains toxin-producing bacteria and that long-term exposure often results in chronic wheezing and other breathing difficulties.<sup>5</sup> The resulting disease—referred to as byssinosis, or brown lung disease—impairs lung function and debilitates affected workers, often forcing them to retire early. Complications arising from the condition can sometimes be fatal.

Byssinosis was a major problem among textile workers in the United States until the Occupational Safety and Health Administration, or OSHA, took action to reduce cotton dust exposure. During the early 1970s, more than 50,000 textile workers suffered from the disease at any given time.<sup>6</sup> Depending on the type of factory they worked in, between 7 and 26 percent of workers were afflicted.<sup>7</sup> In 1978, OSHA issued its first cotton dust regulation, limiting the concentration of the dust allowed in textile factory air.

The rule to combat ambient cotton dust proved remarkably effective in improving worker health. A 1978 Department of Labor report to Congress estimated that there were 51,290 cases of byssinosis in the industry at any given time and estimated that prevalence would decline to 29,245 after the rule was implemented. But the rule was far more effective than predicted. A study conducted in 1983 found that there were only 1,710 cases of byssinosis, a 97 percent decline from just a few years earlier.<sup>8</sup>

The textile industry had long opposed cotton dust regulation. As government attention to byssinosis grew during the 1960s and 1970s, industry groups denied the existence of the disease altogether. During the cotton dust rulemaking process, a spokesman for the American Textile Manufacturers Institute insisted that cotton dust-related health problems affected only 1 percent of textile workers, stating “The problem is grossly exaggerated.” He also claimed that “there has not been a known death from byssinosis,”<sup>9</sup> although studies conducted as early as 1910 conclusively demonstrated that the disease was fatal for some workers.<sup>10</sup> In 1981, shortly after the standard took effect, the American Textile Manufacturers Institute unsuccessfully sued OSHA, claiming that the costs of the regulation did not outweigh the benefits.<sup>11</sup>

Complying with the cotton dust regulation ended up costing much less than expected, and offered the added benefit of increasing productivity. OSHA consultants had estimated capital costs to comply with the rule would be \$550 million, with annual costs of \$171 million (in 1977 dollars).<sup>12</sup> Industry said it would cost more. But a 1983 study found that actual capital costs were \$245 million and annual costs were \$83 million, both less than half the predicted levels.<sup>13</sup>

Additionally, the regulation spurred textile factories to adopt machinery that was both healthier for workers and more efficient for industry. New machines that produced less dust were, on average, seven times faster than the older machines.<sup>14</sup> Resulting productivity increases further offset the cost of complying with the cotton dust regulation.

“Tougher government regulations on workers’ health have unexpectedly given the U.S. industry a leg up,” *The Economist* wrote in 1980. “Tighter dust control rules for cotton plants caused firms to throw out tons of old, inefficient machinery and replace it with the latest available from the world’s leading textile machinery firms in Switzerland and West Germany.”<sup>15</sup>

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### **Lockout/Tagout Standard Prevents Equipment-Related Accidents**

For workers at factories, construction sites, utility plants and shipyards, flipping the wrong switch or pulling the wrong lever can result in injury or worse. A worker repairing a machine that removes bones from chickens, for example, may have her finger cut off if a co-worker inadvertently plugs the machine back in.

This type of safety problem fits into a category called “hazardous energy,” which includes potential dangers arising from the unexpected movement of machinery, as well as the unexpected release of electricity, flammable gas, or water pressure. About three million employees work at sites where hazardous energy is present.<sup>16</sup>

OSHA sought to address injuries and fatalities resulting from hazardous energy when the agency issued the Lockout/Tagout standard in 1989.

The term “lockout” refers to the practice of placing locks on switches, circuit breakers, and valves in order to disable equipment that is undergoing maintenance or would be otherwise hazardous if turned on. “Tagout” refers to the use of brightly-colored tags that warn workers against using or turning on potentially hazardous equipment. The standard requires employers to develop a system of hazardous energy control that incorporates locks and tags. Employers must also document their hazardous energy control practices and provide safety training for workers.

Although business groups did not outright oppose the standard during the rulemaking process, they attempted to weaken it. The American Petroleum Institute lobbied for industry exemptions, as well as provisions that would favor the use of tagout over more effective lockout procedures.<sup>17</sup> After the rule went into effect, the National Association of Manufacturers, or NAM, sued OSHA, unsuccessfully arguing the agency lacked the legal authority to issue safety (as opposed to health) regulations altogether.<sup>18</sup>

The Lockout/Tagout standard has been remarkably successful at improving workplace safety. An analysis of two union databases conducted in 2000 showed that hazardous energy-related fatalities declined, depending on the industry, by between 30 percent and 55 percent in the years following the enactment of the Lockout/Tagout rule.<sup>19</sup> An additional study conducted in Maine sawmills found that workplace injuries were three times less likely to occur for employees of mills that implemented Lockout/Tagout programs.<sup>20</sup> OSHA currently estimates that the regulation prevents 50,000 injuries and 120 fatalities per year.<sup>21</sup>

In the years after the Lockout/Tagout standard was published, industry groups came to support the regulation. Even NAM, which had sued OSHA shortly after the standard was finalized, lauded the regulation in comments submitted to the agency in 2000, although without admitting a change in its legal stance. “NAM believes that the principal requirements of the [lockout/tagout] regulation help promote the development of appropriate safety procedures for service and maintenance operations,” the trade association wrote.<sup>22</sup>

### **Excavation Standard Prevents Trenches from Becoming Graves**

Underground construction projects such as sewer pipe installation jobs require workers to enter subterranean trenches. If employers do not take protective measures, a trench may collapse on workers, trapping them in mud and cutting off their access to air. Trench cave-ins are often deadly. Before government action, an average of 90 fatalities related to trench cave-ins occurred each year.<sup>23</sup>

In 1989, OSHA issued its excavation standard, requiring construction sites to use protective methods in order to stop trenches from caving in. The simplest method of protection involves digging trenches with sloped walls, which prevents falling earth from enveloping the workers. Other methods involve creating temporary walls on the trench to prevent a cave-in or placing steel plates inside the trench to create a protected space for workers should a cave-in occur.

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An analysis conducted a decade after the rule was enacted found that the average annual number of deaths from cave-ins had fallen from 90 to 70.

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Since the excavation standard took effect, fatalities related to trench cave-ins have dropped significantly. An analysis conducted a decade after the rule was enacted found that the average annual number of deaths from cave-ins had fallen from 90 to 70. Adjusting for a 20 percent increase in construction activity during the time period, this represents a 40 percent decrease in the fatality rate.<sup>24</sup>

Trenching protection is now standard practice on construction sites that involve excavation. In comments solicited by OSHA more than a decade after the regulation was enacted, industry groups expressed general support for the regulation.<sup>25</sup>

### **Grain Handling Facilities Standard Prevents Explosions, Suffocations**

Silos, grain elevators, and mills dot much of rural America's landscape. These facilities, which store and process wheat, barley, corn, and other grains, may pose danger to workers in several ways. Highly flammable grain dust can set off explosions when naturally occurring combustible gases are present. Additionally, workers can literally drown when they enter deep bins filled with tons of grain. Before government action, an average of 7 grain workers died each year in explosions and 10 died from suffocation in bins.<sup>26</sup>

After a series of catastrophic grain explosions in the late 1970s left 59 workers dead in just one month, the hazards of grain facilities drew the attention of federal regulators. OSHA began developing its Grain Handling Facilities Standard, which it finalized in 1987. The regulation limited the amount of dust allowed on surfaces within grain facilities and required testing of silos for combustible gases. It also prohibited employees from entering storage bins without a proper harness and a spotter present.

“There has been an unprecedented decline in explosions, injuries and fatalities at grain handling facilities.”

—*National Grain and Feed Association, which initially opposed the grain handling standard (1998)*

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Industry groups and the Reagan administration’s Office of Management and Budget voiced opposition to the Grain Handling Facilities Standard during the rulemaking process. A spokesman for the National Grain and Feed Association derided the proposed limits to grain dust levels, saying, “Research shows no one level of dust is more hazardous than another.”<sup>27</sup> An official from the Office of Management and Budget referred to OSHA’s assessment of grain facility hazards as “substantially overstated.”<sup>28</sup>

In the end, the OSHA standard made grain handling facilities much safer places to work. The National Grain and Feed Association (NGFA), which initially opposed the standard, now finds it to be remarkably effective at improving workplace safety, citing a 95 percent drop in explosion-related fatalities for certain facilities.<sup>29</sup>

In comments submitted to OSHA in 1998, NGFA stated that in the years following the standard, “there has been an unprecedented decline in explosions, injuries and fatalities at grain handling facilities.”<sup>30</sup> OSHA’s analysis shows that the standard prevented an average of five suffocation deaths per year.<sup>31</sup> Data presented by industry showed that the standard annually prevents eight injuries and four deaths resulting from explosions in grain elevators.<sup>32</sup>

### **Mine Safety Rules Save Lives**

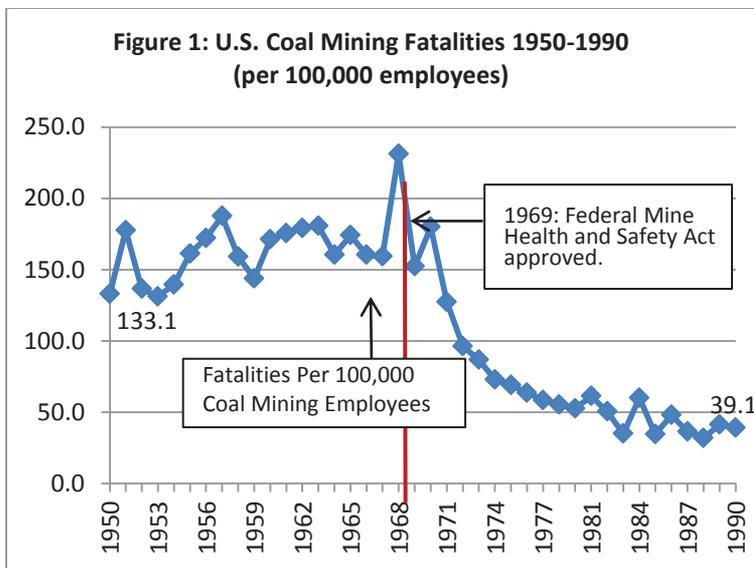
Coal mines are among the most dangerous workplaces in the United States. Workers, facing the ever-present risks of mine explosion and collapse, must perform their jobs in confined spaces near heavy machinery. Since 1900, more than 100,000 mine workers have been killed on the job.<sup>33</sup>

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The year that the Federal Mine Health and Safety Act passed, 152 fatalities occurred for every 100,000 underground coal miners. Fatalities decreased by 50 percent within four years.

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Mining has become dramatically safer, however. The first major decrease in fatality rates began in the late 1940s, as mines began relying less on explosives and more on machinery.<sup>34</sup> But after the early 1950s, progress on mine safety stagnated; the fatality rate remained largely unchanged between 1950 and 1969.<sup>35</sup> The 1969 passage of the Federal Mine Health and Safety Act spurred a dramatic decrease in coal mining fatality rates. [See Figure 1]



Source: Mine Safety and Health Administration

Regulation of the mining industry increased gradually throughout the 20th century. The federal government first addressed mine safety in 1910, when Congress created the U.S. Bureau of Mines (USBM). USBM was primarily engaged in conducting research and investigating catastrophic mine accidents. The agency had no regulatory authority throughout most of its existence. Even after Congress granted it authority to inspect

certain mines in 1952, USBM lacked the power to compel mining operations to make needed changes.

In 1969, Congress passed the Federal Mine Health and Safety Act, the first comprehensive mine safety law. It created mandatory inspection requirements, enforceable health and safety standards, and civil and criminal penalties for willful violations. The law laid the framework for even stronger protections under the Mine Safety and Health Act of 1977, which established the Mine Safety and Health Administration, or MSHA.

In 1969, the year that the Federal Mine Health and Safety Act passed, 152 fatalities occurred for every 100,000 underground coal miners. After the act's passage, fatality rates decreased by 50 percent in just four years.<sup>36</sup>

### **Conclusion**

Amid the current barrage of anti-regulatory rhetoric, it is crucial to remember the important role that government safeguards have in saving lives and protecting public health. These five worker safety regulations were tremendously successful in reducing employee injuries, illnesses and fatalities. For the most part, industry groups initially opposed each regulation while downplaying the hazard in question. Often, they later came to embrace the regulations, even writing supportive comments to government agencies.