

AMERICAN TRENDS IN MINING SAFETY AND HEALTH

Joseph A Main

Department of Occupational Health and Safety
United Mine Workers of America

There are many ways to assess trends in health and safety. One of the most common is a comparative analysis of the number of workers killed on the job. This data is usually the most verifiable. Using that as a benchmark, statistics show that coal mining has historically been among the most dangerous occupations in the United States (US). Although it is still one of the most hazardous, many changes have occurred that have brought about improvements. In recent years the coal mining industry has set tonnage records, and at the same time, reduced mining deaths. For example, in 1997 the coal industry set a production record of 1.09 billion tons. That year there were 30 mining deaths, the lowest number since mining deaths were recorded, dating from the late 1800's. In 1998, the industry again set a new production record of 1.12 billion tons. That year 29 miners were killed on the job, the least number of coal mining deaths on record. That was the fifth straight year that production records were broken with the lowest number of mining deaths on record. The reductions of mining deaths in U. S. coal mines did not just occur. It is also important to note that even with these reductions in mining deaths, there is still much work to be done to achieve health and safety in the US mines.

Despite the improvements in mining health and safety, studies show that the industry is still a dangerous one. A report issued last year by the US Department of Health and Human Services, Centre for Disease Control cited the results of a study on fatal occupational injuries occurring between 1980 and 1994 of all workplaces in the US. The study concluded that mining (which includes coal, metal and nonmetal) led the nation with the highest death rates. The mining fatality rate per 100,000 workers was 30.5. That was followed by agriculture, forestry and fishing with 20.5 and construction with 15.5. The study cited mining as the highest risk industry in twenty-six of the fifty US states. It is apparent that many improvements are needed in the US mining industry.

Although these statistics portray a very hazardous industry, the health and safety record, as noted, has improved. A review of the past five decades provides a more defined view

of the decline in coal mining deaths. During the 1950's, the number of coal mining deaths averaged 483 each year. The 1960's averaged 266 mining deaths. The 1970's averaged 154 deaths annually. The 1980's averaged 94 deaths, and the first nine years of the 1990's averaged 42 deaths. Improved production methods contributed to the decline in mining deaths. Two key elements however, that significantly impacted changes in the nation's mines, were miners demands for health and safety standards, and federal legislation that established strict mining standards and tough penalties and sanctions for mine operators that violated them.

Coal miners in the US spent scores of years urging the federal government to enact health and safety laws that would protect them from injury, illness and death at the workplace. That fight was led by the coal miners' union, the United Mine Workers of America. Demands for safer conditions were on the agenda of the unions beginning with its creation in 1890. The first federal mine safety law was enacted in 1891, but like most mine safety laws the Congress would create over the next eight decades, it was ineffective in curbing mining deaths. Single mine disasters were claiming miners lives in the hundreds, such as the 1907 Monongah mine disaster in West Virginia. Over 360 miners were killed when the mine exploded making this the deadliest mine disaster in US history. That same year over 2,500 miners were killed in US coal mines. As miners were being killed in the hundreds and thousands each year, miners pressed for adequate laws to protect them. In 1910, the Congress created the US Bureau of Mines (Bureau). Its purpose was to collect information and conduct research on mine safety.

The death toll continued to climb and reports of mine disasters became commonplace in the nation's coal fields. The Union continued to demand action. Although they were successful in obtaining health and safety laws in most of the coal states, they were not enough to put an end to the high numbers of deaths. In 1941, Congress increased the role of the Bureau giving it authority to enter the mines, but again they lacked power to act. As mine disasters continued and miners and their Union demanded more action, Congress acted again in 1947 to establish a federal health and safety code. The

Bureau, however, had no enforcement authority. With continuing mining disasters and increased union demands, Congress passed legislation in 1952 increasing the powers of federal inspectors. The new law again left the federal inspectors powerless. They could only issue recommendations to mine operators.

In the late 1960's that all changed. As mine disasters continued to make headlines with the tragedies reported to American families through the television media, public support of the miners and the Union's demands for federal action to make the mines safe grew. One mine disaster in November 1968 particularly captured the attention of the nation. A methane / coal dust explosion at the Farmington #9 mine in northern West Virginia claimed the lives of 78 miners. Rescue and recovery efforts to reach the trapped miners became the daily news in the US. The outrage over the conditions of the mines had reached its peak. In 1969, Congress finally moved decisively enacting laws with teeth. That legislation was known as the 1969 Federal Coal Mine Health and Safety Act (1969 Mine Act). Following passage of that landmark legislation, significant reductions in coal mining deaths occurred. In 1977, the US Congress amended the 1969 Mine Act to increase enforcement, penalties and sanctions against mine operators who fail to comply with the mine health and safety laws. Congress also increased miners and their representatives rights and participation under the law and set minimum training standards for miners. That law, the Federal Mine Safety and Health Act (Mine Act), led to more lives being saved.

The Mine Act is recognised as one of the most successful worker protection laws enacted by the US congress. Although the numbers of miners and mines have significantly reduced over the past two decades, the fatality incidence rates at coal mines identify the decline of mining deaths. In the decade of the 1960's, (prior to the implementation of the 1969 Mine Act) the fatality incidence rate per 200,000 man hours averaged .22. The fatal incidence rate during the decade of the 1990's, through 1998 was .05. That represents a 77% improvement since the 1969 Mine Act was passed. The reduction in the fatal incidence rates has stagnated over the years however. One reason is the increased use of contractors, which will be addressed later.

The Mine Act established stringent mine ventilation, methane, coal dust, electrical and roof control standards to curb mining disasters. The number of mine disasters (accidents claiming five or more lives) resulting from mine explosions, fires, inundations and roof falls

significantly declined. In the 25 years prior to the 1969 Mine Act, coal mine disasters claimed 367 lives. During the 25 year period following implementation of the Mine Act, there was a 54% reduction in deaths from mine disasters. During the 1990's, there has been one coal mine disaster in the US claiming eight lives.

As noted, while mining deaths have been reduced, production has soared under the Mine Act. Mines have become both safer and more productive. The following highlights some key components of the Mine Act. Four complete inspections of each underground mine and two complete inspections of each surface mine by federal mine inspectors are required annually. The law and accompanying health and safety standards establish stringent rules governing all aspects of mining regarding health and safety. It requires mine operators to conduct pre-shift inspections of all work areas miners are to work in before they begin each shift. On-shift inspections, along with electrical, ventilation and escape way inspections are required. The Mine Act sets specific standards for designing coal mines from the roof control requirements to ventilation of mining sections, longwalls, conveyor belt entries, and other areas of the mine. It sets requirements on bleeder systems, escape ways, use of electrical equipment, rock dusting, respirable mine dusts, maintenance, inspection of mining equipment and a variety of others. While each mine is required to have a government approved mining plan covering ventilation, roof control, ground control, respirable coal dust and other matters, those plans must conform to specific law and regulations.

Each violation of the health and safety standards found by the federal inspection authorities carries a penalty. Each violation is assessed a penalty of up to \$55,000. Closure orders are issued for conditions that are considered imminent dangers, along with violations that have not been corrected in the time allotted by inspectors. Companies and individuals can also be criminally prosecuted under the Mine Act, and they are. Since 1990, over 350 companies and individuals have been convicted of violations of the Mine Act in criminal cases.

It is unquestionable that miners, through their labour organisation, have forced much of the mining health and safety improvements contained in the Federal legislation. Miners participation in the implementation of that Mine Act is also equally important. The Mine Act provides miners' representatives the right to participate on any inspection of the mine

conducted by federal inspectors, paid by the mine operator. Those are generally union health and safety representatives. At many large mines federal inspectors are usually at the mines every day. Miners and their representatives also have the right to participate in many procedures under the law including mining plan reviews, modifications of the standards and promulgation of health and safety regulations. They also have the right to challenge actions pertaining to those and other matters. Miners and their representatives can request inspections of the mine of which the federal inspection agency is obligated to conduct.

As pointed out, the number of mine disasters has decreased in the US. There are still mine fires and explosions, but due to stringent standards, they have far less impact on human life. Investigations of those commonly find that mining systems in use did not comply with the law and failed to meet sound mining principles. In many cases, the mine operators attempted to take shortcuts which stripped away part of the safety net. This was the case at the 1989 Pyro mine explosion killing ten miners; 1992 South Mountain #3 explosion where eight miners were killed; 1993 AA&W Elmo #5 mine explosion where one miner was killed; and the 1994 Day Branch mine explosion where two miners were killed. These mines all had a common link. The mine ventilation system was altered in a way that failed to conform to the mining law. We have found that many mine disasters, explosions, and fires have occurred where the mining systems were adversely altered or not designed properly.

These were also mines that did not have labour organisation representation and protection to speak out about unsafe conditions in the mines. This is also a major problem at some US mines leading to increased threats to miners lives. The level of health and safety can be substantially reduced at mines not represented by a labour organisation. Miners at represented mines have much more clout to require the mine operator to comply with health and safety laws. They have much more freedom to speak out when unsafe conditions and practices occur. Recent investigations at US mines have identified this.

Miners exposure to occupational health hazards continues to be a problem in US coal mines. Over the years miners exposure to occupational health hazards has not received the attention that safety hazards have. Although there are a variety of health hazards in the nation's mines, the black lung disease, also known as coal workers pneumoconiosis, is the most common. An independent investigation last year carried out by the Louisville Courier-Journal, a Kentucky

newspaper, confirmed that many mine operators were reporting false respirable coal dust samples to the federal government. Following interviews with over 250 miners, supervisors and managers in the Appalachian coal fields, the newspaper reported the existence of the widespread cheating going on to hide the coal dust levels. It found that miners, particularly at the smaller non union mines, were being placed in unhealthy coal mine dust that leads to the black lung disease. The investigative article findings were consistent with government enforcement actions. Since 1990, over 160 companies and individuals have been convicted, under the criminal provisions of the Mine Act, of submitting false respirable coal mine dust samples to the federal government. Most of the mines affected were the smaller mines where a labour organisation did not represent miners. There are currently many actions underway to reform the respirable mine dust programs in the US.

It is difficult to determine occupational disease trends in the US. Following suspicions that mine operators were failing to report occupational illnesses, the federal government gave the industry the opportunity to report, penalty free, occupational illnesses at US mines they had failed to report during the previous five years. When the grace period ended last year, over 3,000 previously undisclosed illnesses were reported. Most came from the coal industry. There is still belief that many more occupational illnesses have not been reported by mine operators.

Miners exposure to a variety of chemicals and harmful agents that will make them ill is a major concern. Miners exposure to the unhealthy exhaust coming from diesel equipment is at the top of that list. There has been a steady increase in the use of diesel equipment in underground coal mines. In the early 1970's there were about 100 diesel units underground. Today, there are about 3,000. Recent studies have disclosed the harmful effects of the diesel exhaust which among other things can cause lung cancer at high rates. New regulations are being developed to respond to these serious health risks. When one attempts to determine the trend of total injuries in the U S, a dilemma exists similar to illnesses. The all injury incidence rates in the U S coal mining industry have been somewhat erratic. For example, one of the lowest incidence rates for all injuries recorded since 1980 occurred in 1984. That year 125 miners were killed in mining accidents, more than any year since 1981. That incidence rate was lower than 1997, when 30 miners were killed in mining

accidents. Since 1980, the injury rate has fallen dramatically, risen back to about the same level and dramatically declined again. Reliability of the reporting has often been questioned. Over the years government audits of single mining companies reporting has revealed hundreds of unreported injuries / illnesses. The recent disclosures of unreported illnesses during the penalty free "grace period" has added to the unreliability of the data.

As noted, the use of contractors at mines has had an impact on mining health and safety, and one which should not be used as a model. In 1983 the federal government began providing independent contractor injury, illness and employment data separate from the mine operators' data. The data has disclosed that a trend in the US mining industry has been replacing miners jobs with contractors. From the reported data, contractors accounted for only 4% of the total coal mining industry employment in 1983. While the number of coal miners steadily declined throughout the 1980's and 1990's, the number of contractors steadily increased. By 1998 the contractors share of total man hours reported was four times that of 1983. The contractors also had higher death rates. In 13 of the 16 years between 1983 and 1998 contractor fatal incidence rates were higher than those of mine operator rates, with some years two to three times higher.

The use of contractors is not just limited to the coal industry. The total mining industry (coal, metal & non metal) has increased the use of contractors. As noted from the following table on fatal incidence rates, by substituting miners with contractors, the mining industry has substantially increased the death rates.

1994	.023	.048
1995	.026	.068
1996	.025	.036
1997	.022	.071
1998	.021	.051

Source: US Department of Labor – Mine Safety and Health Administration

* Incidence rates are number of deaths per 200,000 man hours annually

Haulage, machinery, roof and rib falls continue to be the leading type of coal fatal accidents in the US. This has been the case for years. In 1998, of the 29 fatal accidents, 14 were roof and rib falls, 8 involved haulage and 3 were machinery. Of the 30 fatal accidents in 1987, 12 were haulage, 9 were roof and rib falls and 3 were machinery. In 1996, of the 39 fatal accidents, 11 fatal accidents were haulage, 10 were roof and rib falls and 7 were machinery.

US MINING FATAL INCIDENCE RATES*
1983 - 1998
(All mining-coal, metal & non-metal)

Year	All mining	All contractors
1983	.034	.094
1984	.050	.124
1985	.030	.105
1986	.037	.056
1987	.034	.097
1988	.023	.104
1989	.029	.066
1990	.030	.073
1991	.029	.066
1992	.024	.082
1993	.026	.074