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A Summary of Injury Data for Independent Contractor Employees in the Mining Industry From 1983 Through 1990

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

h	hour	h/yr	hour per year

A SUMMARY OF INJURY DATA FOR INDEPENDENT CONTRACTOR EMPLOYEES IN THE MINING INDUSTRY FROM 1983 THROUGH 1990

By L. L. Rethi[1] and E. A. Barrett[2]

ABSTRACT

The U.S. Bureau of Mines summarized injury data for independent contractor employees working at all locations of coal and metal-nonmetal mines from 1983 through 1990. During the eight years, the greatest contrast in degree of injury between independent contractor and operator employees was in *fatalities*.

From 1983 through 1990, there were 132 independent contractor employee fatalities in the mining industry. In 1988, though, independent contractor employees accounted for nearly one-fourth of all mining fatalities. The fatality incidence rates of independent contractors were consistently higher than those of operators during the eight years. For instance, in 1990, the contractors' rate was twice that of operator employees in coal mining and nearly five times that of operators in metal-nonmetal mining. Three other salient facts highlight the independent contractor employees' fatality injury data during these years. First, 82% of the independent contractor employee fatalities occurred at surface locations. Second, two job classifications—truck driver and equipment operator—represented 37% of the fatalities throughout the 8-year period. And finally, four accident classifications—powered haulage, slips and falls, machinery, and electrical—accounted for 71% of all independent contractor employee fatalities.

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INTRODUCTION

A major shift in the makeup of the mining work force has developed in recent years. The combined number of workers (independent contractors and operators) in the mining industry—coal and metal-nonmetal miners at underground, surface, and prep plant or mill locations—remained relatively constant from 1983 through 1990. However, there was a sizeable increase in the number of independent contractor employees during these years. Table 1 shows how the numbers adjusted annually. The combined number of workers in the mining work force changed each year by just a few percentage points, at most. But the number of independent contractor employees increased steadily and, in fact, more than doubled from 1983 through 1990.

Table 1.—Number of independent contractor and mining industry employees from 1983 through 1990

Year	Combined mining work force	Independent contractors
1983	372,623	22,665
1984	386,787	24,259
1985	375,202	26,947
1986	357,023	26,768
1987	348,239	28,763
1988	353,165	35,119
1989	359,028	42,475
1990	363,184	45,985

During these years, the percentage of independent contractor employees in the mining industry, however, still remained relatively small when compared with the total number of workers. In 1983, independent contractors represented approximately 6% of the mining work force, and in 1990, the number grew to approximately 13% of the work force.

In these eight years, the average number of hours that each independent contractor employee worked annually remained consistent with the increase in workers. That is, hours on the job kept pace with the rising number of independent contractor workers, such that they averaged approximately 1,000 h of work per person for all mining work activities each year.

Several reasons account for the trend of "more independent contractors" in the mining work force. The primary motive for hiring independent contractors is economic. Often, it is more cost effective to contract for services that are needed occasionally for a brief period of time during any phase of the mineral extraction and refinement process. Further, as market conditions change, mining companies supplement their permanent work force with independent contractors in order to complete a particular job. Concern over liability (insurance) is another reason for hiring independent contractors. For job tasks that require personnel to have specific training, possess special licenses, or be insured for a particular occupation, it becomes necessary to employ persons who are familiar with the legal requirements and responsibilities of their business. An example of this is an independent contractor who removes underground fuel tanks. This activity requires qualified personnel who, in addition to knowing the Title 30 requirements of the Mine Safety and Health Administration (MSHA), are cognizant of the specific environmental and safety obligations mandated by the Environmental Protection Agency and the Occupational Safety and Health Administration.

Who are independent contractors? MSHA defines an independent contractor as "any person, partnership, corporation, subsidiary of a corporation, firm, association or other organization that contracts to perform services or construction at a mine."[3] Mine operators employ independent contractors to perform a variety of production and support services. A sample of independent contractor occupations includes security guards, supervisors, truck drivers, technicians, production workers, chemists, drillers and blasters, construction workers, equipment operators, iron workers, and mechanics.

Who are *not* independent contractors? Employees in the above job classifications who work for contract mines *and* who are on the payroll of the parent company that owns or leases the mine are not independent contractors. Contract mines are operated by a contractor company that is hired by the mine owner. The workers, because they are paid by the parent company, in effect, have permanent jobs with that company, at least during the life of the contract. Injuries to these workers are reportable by the parent company, and therefore, the workers are classified as operator employees. MSHA injury data for employees working at contract mines are, and have always been, incorporated with injury data for operators. Companies that are contracted by the mine operator to perform specific tasks are classified as independent contractor employees.

Because the expanded use of independent contractors in mining is relatively recent, the nature and characteristics of their work will be briefly noted. Independent contractors may work on mine property for several hours or several months, depending on the scope of the job for which they have been hired. For example, the delivery of diesel fuel may take minutes to complete, but the installation of an access road to the mine property may take

[3]U.S. Code of Federal Regulations. Title 30—Mineral Resources; Chapter I—Mine Safety and Health Administration, Department of Labor; Subchapter G—Filing and Other Administrative Requirements; Part 45—Independent Contractors; July 1, 1992.

several months. At any given time, the number of independent contractors working on mine property can range from a single employee to several hundred employees representing many companies.

The size of an independent contractor company as well as the type of service(s) offered can vary considerably. Some companies consist of a single individual, such as a truck driver who owns and operates one truck, or several persons who own and operate a fleet of trucks. Other examples of the variety of independent contractor jobs are a three-person crew at an auger mine (auger carriage man, a helper, and a general laborer); a company of several hundred employees offering services, such as painting, welding, and general construction; and a shaft and slope construction company consisting of perhaps 15 employees.

The independent contractor company may service just one mining site for one operator or many sites for many operators. At times, they provide a single service and work only at one specific location. An example is a truck driver who is permanently employed at a preparation plant to haul reject material to a stockpile located on the mine's property. Other independent contractor companies, however, can provide services to various segments of a mining company. A welding contractor, for example, may provide its services to a half-dozen company mines and work at several locations on the mine property, such as the prep plant, surface, and underground operations.

The increased utilization of independent contractors for industrial operations is not limited to the mining industry alone. A recent report, prepared for the Department of Labor by the John Gray Institute of Beaumont, TX, confirms that independent contractor workers can account for up to 54% of all hours worked in the petrochemical industry.[4] The report further indicates that the industry is relying more and more on independent contractors who, on average, have less training and education than direct-hire workers. And, according to the report, independent contractors often do the riskiest jobs, and this increases the possibility of accidents.[5] Greater involvement of independent contractors in mining, too, means more exposure to hazards and thus more potential for, and involvement in, accidents and injuries. Indeed, the injury data presented in this summary indicate this.

The purpose of this report is to summarize and present quantitative information on independent contractor injuries. This work was done in support of the U.S. Bureau of Mines goal to enhance the safety of miners working throughout the industry. The report is somewhat unique because injury data are typically not presented for individual segments of the mining industry, i.e., independent contractors. Traditionally, both independent contractor and operator injury data are combined into a format that represents the general mining work force. The report is not an analysis or a review of the injury data; consequently, no interpretations or inferences are made. However, it does contain comparative data on mine operators so the reader can discern how independent contractors contrast with the rest of the mining industry. Information is presented using tables and graphs that depict injury data over an 8-year period, from 1983 through 1990. Three sources of data were used: (1) the *Annual Closeout Editions* of MSHA's *Mine Injuries and Worktime Quarterly*, (2) the HSAC Accident and Injury Data Base transformed to a working format using dBaseIII, and (3) official MSHA accident investigation reports.

ACKNOWLEDGMENTS

The authors wish to thank David L. Garry, mining industry research specialist, Kristi L. Burns, statistical assistant, and Susen A. Braughler, general clerk, for their contributions to this report. Mr. Garry, an experienced miner, was responsible for compiling data and providing the authors with valuable insight into the independent contractor segment of the mining industry. Ms. Burns was responsible for creating a data base and using this information to provide statistical data. Ms. Braughler was also responsible for compiling data and for preparing the figures and tables.

INDEPENDENT CONTRACTOR EMPLOYEE WORK FORCE

The movement of independent contractors into traditional mining occupations has resulted in considerable change in the constituency of the work force. This section reviews data on the size of the independent contractor work force and hours worked during the years 1983 through 1990. The MSHA reporting procedures that are used to determine both measures are also presented. The intent here is to inform the reader of the magnitude of the contractor work force compared with operators and how those numbers are obtained.

[4]John Gray Institute, Lamar University System (Beaumont, TX). Managing Workplace Safety and Health: The Case of Contract Labor in the U.S. Petrochemical Industry (Dep. Labor grant W9F00860). Dep. Labor, 1991, 227 pp.

[5]Work cited in footnote 4.

NUMBER OF INDEPENDENT CONTRACTOR EMPLOYEES, 1983-90

Table 2 shows the number of independent contractors and operators working in the mining industry from 1983 through 1990. The data are organized by location and industry so that relative sizes and annual changes of each component can be noted.

The number of independent contractor employees in both coal and metal-nonmetal mining more than doubled between 1983 and 1990. In coal mining the number changed from 11,312 in 1983 to 20,752 in 1990, an 83% increase; in metal-nonmetal mining it rose from 11,353 to 25,233, an increase of 122%. At the same time, there was an average decrease in the number of operator employees. In coal mining, operator employees decreased by 22% but in metal-nonmetal mining, there was a slight increase of 4%. Combined, though, operator employees experienced a net decrease of about 10% during the 8-year period.

Table 3 shows how this independent contractor employee change ranks, in percent, with regard to industry and location between 1983 and 1990. The greatest change occurred in "metal-nonmetal, mills" and the smallest change was in "metal-nonmetal, underground." The latter figure, however, may be an anomaly because just 1 year earlier, in 1989, the "metal-nonmetal, underground" figures showed an increase of 15% in independent contractor employees (refer to table 2). In fact, an increase was also reported for this group in each preceding year, from 1986 through 1989.

Tables 2 and 3 further show that the largest overall growth in independent contractor employees occurred in metal-nonmetal mining. This increase was most apparent at surface and mill locations. Figure 1 shows the number of independent contractor employees at all coal mining operations—underground, surface, and prep plant—from 1983 through 1990. Figure 2 shows the number of independent contractor employees at all metal-nonmetal mining operations—underground, surface, and mills—for the same period.

In every year between 1983 and 1990, the greatest concentration of independent contractor employees was at surface mines, both coal and metal-nonmetal. These were followed closely by "metal-nonmetal, mills," which had the third highest number of independent contractor employees. The smallest concentration was found at "metal-nonmetal, underground" mines and coal prep plants.

The increases noted above notwithstanding, independent contractor employees still represented a small portion of the overall work force in the mining industry during these eight years. Figures 3 and 4 show the relative size of the independent contractor work force as it compared with operators from 1986 through 1990. The latter five years are used because the total number of independent contractor employees was somewhat constant between 1983 and 1985, and the sizeable increase began to materialize in 1986.

Table 2.—Number of independent contractor and operator employees by industry and location from 1983 through 1990

Year	Underground		Surface		Prep plant or mill[1]	
	Operators	Contractors	Operators	Contractors	Operators	Contractors
			COAL			
1983	99,015	2,469	58,727	5,648	19,931	3,195
1984	102,703	2,674	61,478	7,195	20,512	3,035
1985	97,488	3,544	57,207	6,445	19,221	2,948
1986	91,052	3,104	54,094	6,509	18,185	2,656
1987	82,829	2,970	51,126	7,329	16,935	2,616
1988	78,797	3,172	48,144	8,191	16,332	2,543
1989	75,922	4,279	45,812	9,325	15,996	3,995
1990	76,777	5,664	45,127	10,441	16,121	4,647
			METAL-NONMETAL			
1983	19,472	2,665	80,190	5,875	72,623	2,813
1984	18,698	1,290	84,076	7,134	75,061	2,931
1985	16,707	1,470	86,352	7,733	71,280	4,807
1986	14,997	1,409	84,441	8,398	67,486	4,692
1987	14,617	1,602	85,742	9,288	68,227	4,958
1988	15,518	2,085	88,031	10,247	71,224	8,881
1989	16,359	3,076	89,108	13,115	73,356	8,685
1990	16,387	2,269	89,900	13,844	72,887	9,120

[1]Prep plant for coal production, mill for metal-nonmetal production.

Table 3.—Percent change in number of independent contractor employees from 1983 through 1990

Rank	Industry	Location	Change, %[1]
1	Metal-nonmetal	Mill	+224
2	do.	Surface	+136
3	Coal	Underground	+129
4	do.	Surface	+85
5	do.	Prep plant	+45
6	Metal-nonmetal	Underground	-15

[1]Plus sign denotes an increase, and minus sign denotes a decrease.

NUMBER OF INDEPENDENT CONTRACTOR EMPLOYEE HOURS, 1986-90

The number of independent contractor employee hours in both coal and metal-nonmetal mining for the years 1986 through 1990 is shown in figure 5. As noted in the previous section, the real increase in hours worked also became apparent in the latter five years of the period. Until then, the number of independent contractor employee hours worked annually remained relatively constant. For the 8-year period, this number consistently averaged around 1,000 h per independent contractor employee.

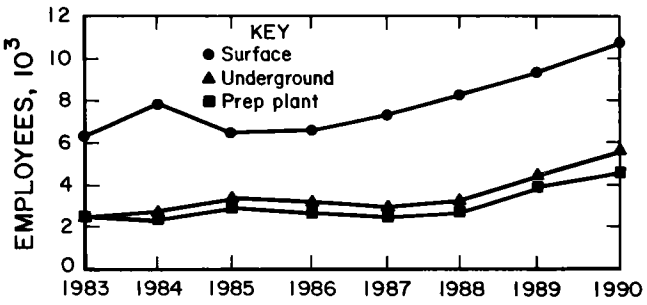

Figure 1.—Number of independent contractor employees at coal surface, underground, and prep plants from 1983 through 1990.

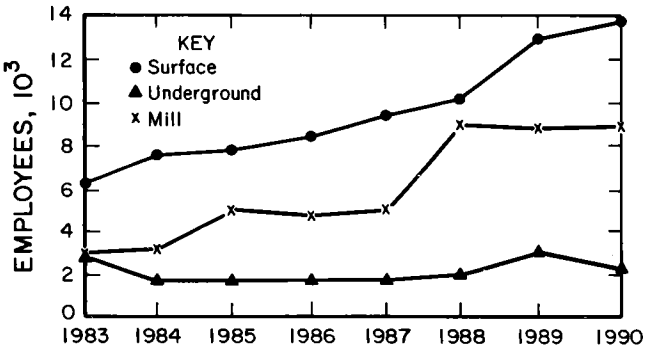

Figure 2.—Number of independent contractor employees at metal-nonmetal surface, underground, and mills from 1983 through 1990.

The average number of hours worked in the mining industry per year for independent contractor employees is determined by dividing the number of employee hours from figure 5 by the number of independent contractor employees noted earlier in table 2. In 1990, for example, the number of independent contractor hours in coal mining totaled approximately 21,000,000. The number of independent contractor employees in coal mining during that year was nearly 21,000. This computes to about 1,000 h/yr per independent contractor employee.

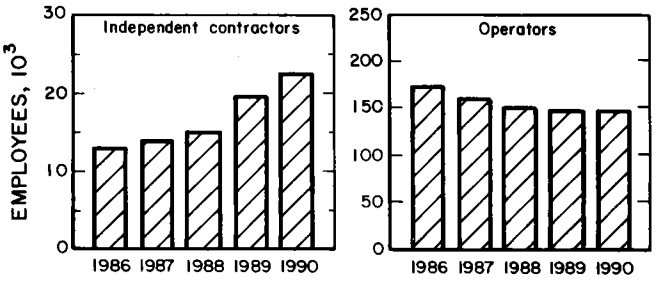

Figure 3.—Number of independent contractor and operator employees in all coal mining locations from 1986 through 1990.

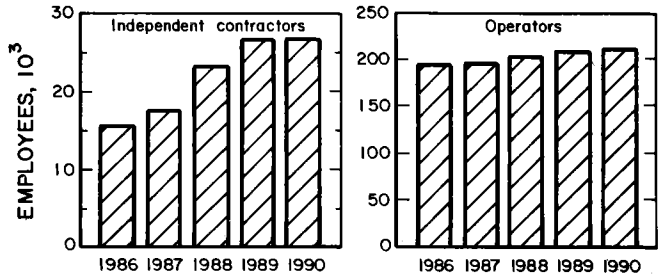

Figure 4.—Number of independent contractor and operator employees in all metal-nonmetal mining locations from 1986 through 1990.

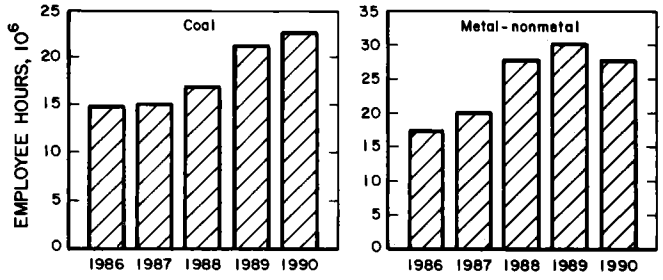

Figure 5.—Independent contractor employee hours in coal and metal-nonmetal mining at all locations from 1986 through 1990.

In contrast, the average number of employee hours annually worked by operators in both coal and metal-nonmetal mining during this period was approximately 2,000 h per employee.

MSHA REPORTING PROCEDURES

CFR Title 30, Part 50 mandates that mine operators report accidents and employment and production figures to MSHA.[6] Similarly, independent contractors must follow these same reporting requirements. Forms 7000-1 and 7000-2 are used for this purpose by both groups. Form 7000-1, the *Mine Accident, Injury, and Illness Report*, is filed by the independent contractor when reporting each accident, occupational injury, or illness that occurs at the mine where the company is working. Form 7000-2, the *Quarterly Mine Employment and Coal Production Report*, is filed to report the number of mining employees, employee hours, and production for which the independent contractor is responsible. The 7000-1 form is submitted to MSHA following each accident or illness occurrence; form 7000-2 is submitted to MSHA every 3 months.

Some independent contractors can report only the number of employees and employee hours for their particular work activity on mine property on form 7000-2. A company, for example, hired to paint a building on the mine property would have no knowledge of production, and consequently, could not report those figures.

The total number of independent contractor employees working on mine properties industry-wide for any given year is then tabulated by MSHA using the quarterly 7000-2 forms. This figure, calculated as a mean, reflects the number of working employees based upon the company's payroll schedule reported for each quarter. The quarters are then averaged for the year. The following example will illustrate this procedure.

EXAMPLE

Independent contractor company XYZ pays its employees every 2 weeks, and over a 12-week quarter the company has six pay periods. The bookkeeping records for these pay periods show the following number of employees:

Pay period:	Number of employees:
1	8
2	10
3	8
4	6
5	4
6	4
Total	40

The total number of employees, 40, is divided by the number of pay periods, 6, to produce an average of 6.66 or 7 employees for the quarter. When form 7000-2 is sent to MSHA at the end of the quarter, it is reported that the independent contractor company had seven mining employees working for the quarter. To calculate the number of employees for an entire year, the averages shown for the four quarterly reports are used. If company XYZ averaged 7, 9, 8, and 10 independent contractor employees for each quarter in the year, MSHA would report that the number working for the year is 8.5 or 9. But, in reality, the company may have had, perhaps, 20 different employees on the mine property that year.

It is possible that company XYZ could have different persons working during some pay periods in any given quarter. Because of specialization by workers, employee turnover, job pooling of the work force, etc., an undetermined number of different individuals may have worked. Regardless, the average number of employees reported to MSHA on the quarterly forms would still be 7, 9, 8, and 10.

GLOSSARY OF TERMS

The injury data terminology used in this report has different meanings or understandings, depending on the particular context in which the terms are used or the type of industry using them. For clarification, a condensed glossary of the terms, as commonly used in the mining industry, is presented in this section. The definitions are extracted from various MSHA inspection, policy, and regulation documents.

Nonfatal Days Lost (NFDL): These are nonfatal injury occurrences that result in days away from work or days of restricted work activity.

[6]U.S. Code of Federal Regulations. Title 30—Mineral Resources; Chapter I—Mine Safety and Health Administration, Department of Labor; Subchapter M—Accidents, Injuries, Illnesses, Employment, and Production in Mines; Part 50—Notification, Investigation, Reports, and Records of Accidents, Injuries, Illnesses, Employment, and Coal Production in Mines; July 1, 1992.

No Days Lost (NDL): These are nonfatal injury occurrences resulting only in loss of consciousness or medical treatment, other than first aid, with no days lost.

NFDL Incidence Rate: This represents the number of NFDL injuries that occurred for each 200,000 employee hours worked. The rate is calculated by dividing the number of injury occurrences by the number of employee hours worked and then multiplying by 200,000. The industry standard of 200,000 is based on 100 persons working 2,000 h annually.

Fatality Incidence Rate: This represents the number of fatalities that occurred for each 200,000 employee hours worked. The rate is calculated by dividing the number of fatal occurrences by the number of employee hours worked and then multiplying by 200,000.

Accident Classifications: The categories of accidents to which an incident is assigned. Five noted in this report include the following:

Electrical: Accidents in which the electric current is most directly responsible for the resulting accident.

Material Handling: Accidents that are most directly caused by handling material. This category applies to lifting, pulling, pushing, and shoveling material. The material may be in bags or boxes, or it may be loose sand, coal, rock, timber, etc.

Powered Haulage: Accidents caused by motion of the haulage unit or by moving a part of the haulage unit. Powered haulage includes motors and rail cars, conveyors, shuttle cars, haulage trucks, front-end loaders, load-haul-dumps, forklifts, etc.

Machinery: Accidents in which the motion of the machinery causes the accident. This category includes electric and air-powered tools, mining machinery, loaders, slushers, draglines, power shovels, etc.

Slips and Falls: Accidents that include stepping in a hole and falling while getting on or off equipment that was not moving. This classification also includes accidents that occur while walking on machines and haulage equipment and while servicing or doing repair work.

INJURY DATA (NDL, NFDL, F) FOR INDEPENDENT CONTRACTOR AND OPERATOR EMPLOYEES

Injury data for *all occurrences* of both independent contractor and mine operator employees are presented in this section. *All occurrences* is a collective term that includes the following degrees of injury: *no days lost* (NDL), *nonfatal days lost* (NFDL), and *fatal* (F). The definitions of NDL and NFDL types of injuries are noted in the glossary of terms. The following comparisons are made: (1) incidence rates for *all occurrences*; (2) incidence rates for *all occurrences* by location; and (3) NDL, NFDL, and F incidence rates. The data cover the years 1983 through 1990.

COMPARISON OF INCIDENCE RATES FOR ALL OCCURRENCES, 1983-90

Table 4 shows that *all occurrences* incidence rates for independent contractor employees in both coal and metal-nonmetal mining remained somewhat constant between 1983 and 1990. However, the *all occurrences* incidence rates for operators in both coal and metal-nonmetal mining generally increased during these years. From 1987 through 1990, though, the *all occurrences* incidence rates for operator employees in coal mining were two to over three times greater than for independent contractor employees. For metal-nonmetal mining, the situation was different. Here, the *all occurrences* incidence rates were just slightly higher for independent contractor employees than for operator employees from 1983 through 1988. In 1989 and 1990 this situation reversed itself, and metal-nonmetal operator employees had slightly higher *all occurrences* incidence rates.

Table 4.—Incidence rates for *all occurrences* from 1983 through 1990

Industry and employee	1983	1984	1985	1986	1987	1988	1989	1990
Coal:								
Operators	7.04	6.98	6.58	7.43	10.78	11.31	11.08	10.38
Contractors	4.73	4.18	4.65	4.36	5.57	4.54	4.93	3.90
Metal-nonmetal:								
Operators	4.43	4.52	4.47	4.89	6.30	7.55	8.02	6.89
Contractors	5.96	5.49	4.79	4.93	6.62	7.88	7.48	5.94

COMPARISON OF INCIDENCE RATES FOR ALL OCCURRENCES BY LOCATION, 1987-90

Independent contractor and operator employee incidence rates for *all occurrences* with respect to location are shown in table 5. The last four years, 1987 through 1990, are indicative of the rates that existed throughout the 8-year period from 1983 through 1990. The table shows that incidence rates for independent contractor employees working at coal preparation plants and mills are relatively high. Incidence rates for operator employees working in both coal and metal-nonmetal underground mines were consistently much higher than for any other operator locations during the four years.

Table 5.—*All occurrences* incidence rates for independent contractor and operator employees by location from 1987 through 1990

Year, industry, and employee	Underground	Surface	Prep plant or mill[1]
1987			
Coal:			
Operators	15.81	0.51	7.79
Contractors	7.40	3.80	10.35
Metal-nonmetal:			
Operators	10.53	6.25	7.60
Contractors	8.08	4.76	11.18
1988			
Coal:			
Operators	16.75	5.62	7.84
Contractors	7.44	3.39	7.54
Metal-nonmetal:			
Operators	12.09	7.26	9.35
Contractors	10.59	6.68	9.91
1989			
Coal:			
Operators	16.47	6.02	8.31
Contractors	6.38	4.04	7.84
Metal-nonmetal:			
Operators	12.38	8.28	9.46
Contractors	8.57	4.59	12.37
1990			
Coal:			
Operators	15.04	5.33	7.55
Contractors	6.60	2.67	5.58
Metal-nonmetal:			
Operators	10.65	7.34	7.85
Contractors	6.61	4.07	9.71

[1]Prep plant for coal production, mill for metal-nonmetal production.

COMPARISON OF NDL INCIDENCE RATES, 1983-90

Figure 6 shows the NDL incidence rates for independent contractor and operator employees during the years 1983 through 1990. With the exceptions of 1989 and 1990, independent contractor employees in metal-nonmetal mining experienced higher NDL incidence rates than operator employees. However, independent contractor employees in coal mining had consistently lower NDL incidence rates for the 8-year period.

COMPARISON OF NFDL INCIDENCE RATES, 1983-90

Figure 7 shows the NFDL incidence rates of independent contractor and operator employees from 1983 through 1990. In metal-nonmetal mining, both independent contractor and operator employees experienced similar NFDL incidence rates during these years. In coal mining, however, operator employees consistently had higher NFDL rates each year. Independent contractor employees in coal mining had higher NFDL incidence rates than employees in metal-nonmetal mining from 1983 to 1987, but from 1987 through 1990, the situation was reversed. In those years, independent contractor employees in metal-nonmetal mining had higher NFDL incidence rates.

COMPARISON OF F INCIDENCE RATES, 1983-90

Figure 8 shows the fatality incidence rates for independent contractor and operator employees for the years 1983

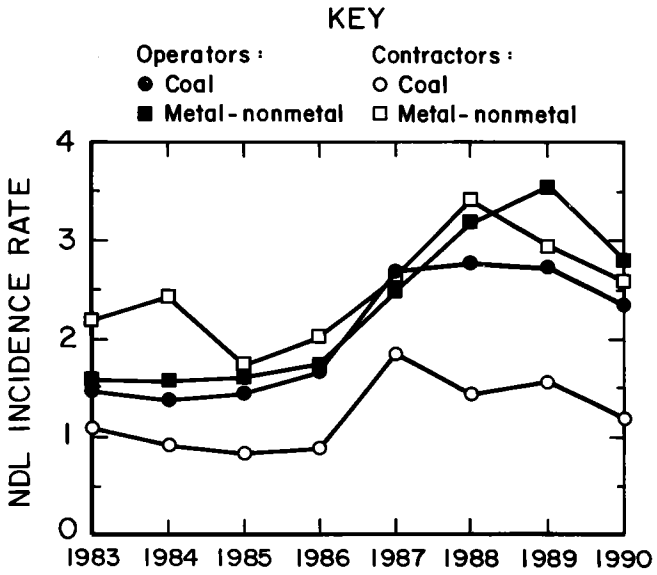

Figure 6.—No days lost (NDL) incidence rates for independent contractor and operator employees from 1983 through 1990.

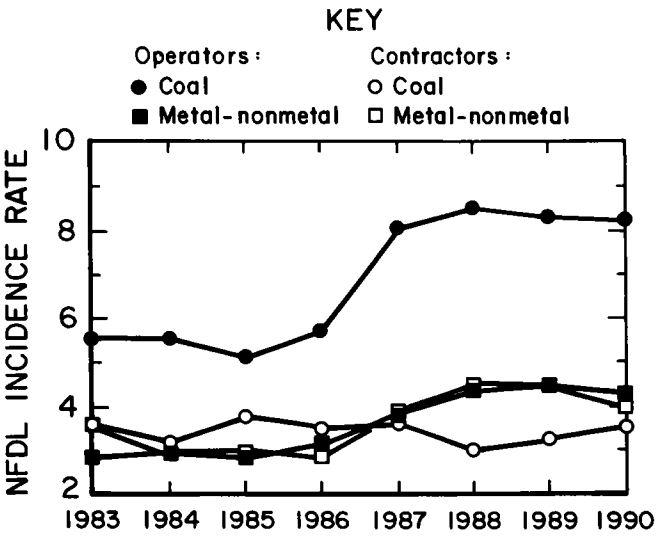

Figure 7.—Nonfatal days lost (NFDL) incidence rates for independent contractor and operator employees from 1983 through 1990.

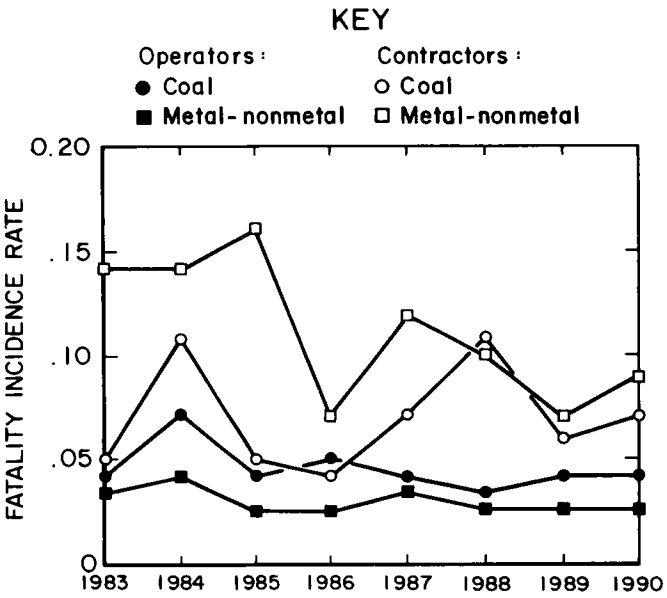

Figure 8.—Fatality incidence rates for independent contractor and operator employees from 1983 through 1990.

through 1990. With the exception of one year, 1986, independent contractor employees annually had higher fatality incidence rates than operator employees. In some years their rates exceeded those of operator employees by a factor of nearly 5. Fatality incidence rates are summarized in more detail later in this report.

INJURY DATA (NDL, NFDL, F) FOR INDEPENDENT CONTRACTOR EMPLOYEES

In this section, *all occurrences* injury data for independent contractor employees are presented. Three areas are noted: (1) incidence rates for *all occurrences* by industry and location; (2) accident classification of reported incidents; and (3) work activities of accident classifications. *All occurrences*, again, includes *no days lost* (NDL), *nonfatal days lost* (NFDL), and *fatal* (F) injuries.

INCIDENCE RATES FOR ALL OCCURRENCES BY INDUSTRY AND LOCATION, 1987-90

Figure 9 shows that independent contractor employees working in coal mining from 1987 through 1990 experienced their highest *all occurrences* incidence rates at preparation plants, followed in order by underground and surface locations. However, for one year, 1990, independent contractor employees in "coal, underground" locations had the highest incidence rate among the three locations. In metal-nonmetal mining, independent contractor employees experienced their highest *all occurrences* incidence rates at mills, followed by underground and surface locations. For both industries combined, the highest all *occurrences* incidence rates were experienced by independent contractor employees working in prep plant and mill locations. The rates for *all occurrences* from 1987 through 1990 are representative of rates that existed throughout the entire 8-year period.

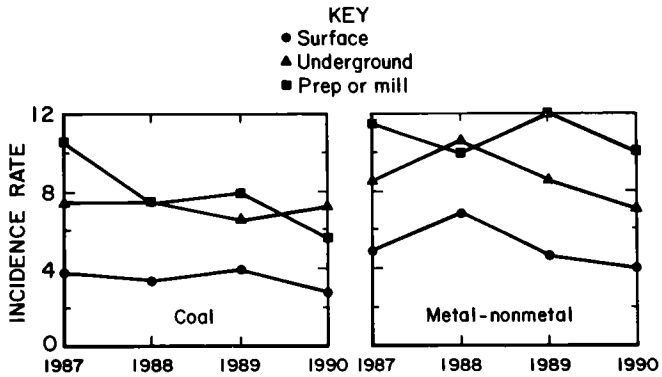

Figure 9.—*All occurrences* incidence rates for independent contractor employees by industry and location from 1987 through 1990.

ACCIDENT CLASSIFICATIONS OF REPORTED INCIDENTS, 1989-90

Table 6 shows the three accident classifications that constituted the majority of independent contractor employee incidents for 1989 and 1990. They were material handling, machinery, and slips and falls. The accident classifications for these two years adequately represent those classifications that occurred most often throughout the years 1983 through 1990. In 1989, 1,066 of the 1,457 lost time accidents reported by independent contractor employees were attributed to these three accident classifications. This amounts to 71% of all independent contractor employee injuries. In 1990, 1,058 of the 1,524 lost time accidents reported by independent contractors, or 69%, were attributed to these same three accident classifications. The accident totals include independent contractor employees in both coal and metal-nonmetal mining. In prep plants and mills, the incidents in these accident classifications exceeded underground and surface locations by approximately 10%.

WORK ACTIVITY OF ACCIDENT CLASSIFICATIONS, 1989-90

Six work activities in both coal and metal-nonmetal mining accounted for the majority of independent contractor employee injuries from 1983 through 1990. Table 7 represents current trends by looking at just the latter two years, 1989 and 1990. During these years, injuries in these six work activities represented approximately two-thirds of the total injuries reported for all locations (underground, surface, and prep plants and mills).

Table 6.—Independent contractor employees' occurrences by accident classification and location for 1989 and 1990

	Underground		Surface		Prep plant or mill[1]	
	1989	1990	1989	1990	1989	1990
COAL						
Accident classification:						
Material handling	41	58	54	45	47	44
Machinery	26	32	48	44	36	23
Slips and falls	23	41	45	44	31	39
Total	90	131	147	133	114	106
Total number of accidents, all classifications	130	205	216	199	150	138
Top 3 classifications % of total	69	64	68	67	76	77
METAL-NONMETAL						
Accident classification:						
Material handling	29	19	84	89	194	177
Machinery	25	19	60	74	114	114
Slips and falls	11	13	68	73	130	100
Total	65	51	212	236	438	401
Total number of accidents, all classifications	96	78	303	369	562	535
Top 3 classifications % of total	68	65	70	64	78	75

[1]Prep plant for coal production, mill for metal-nonmetal production.

Table 7.—Number of injuries for work activities in major accident classifications for independent contractor employees for 1989 and 1990

	Coal		Metal-nonmetal	
	1989	1990	1989	1990
Activity:				
Getting on-off equipment	38	48	50	43
Handling material or supplies	147	138	345	297
Using hand tools	60	46	136	101
Machine maintenance	38	41	70	85
Walking or running	42	44	85	57
Welding or cutting	23	28	79	49
Total	348	345	765	632
Total number of injuries, all activities	535	545	1,150	990
Top 6 activities % of total	65	63	66	64

FATALITY INJURY DATA FOR INDEPENDENT CONTRACTOR AND OPERATOR EMPLOYEES

Fatality injury data for both independent contractor and operator employees are presented in this section. The following areas are addressed: (1) number of fatalities for *all mining* and (2) comparison of fatality incidence rates for *all mining*. The term *all mining* refers to coal and metal-nonmetal mining at surface, underground, prep plant, and mill locations.

NUMBER OF FATALITIES FOR ALL MINING, 1983-90

Table 8 shows the number of fatalities attributed to the mining industry during the 8-year period. As previously noted, independent contractor employees averaged approximately 10% of the mining work force during the years 1983 through 1990. During the first four years of this period, 1983 through 1986, independent contractor employees averaged an equivalent number of mining industry fatalities, approximately 10%. However, during the last four years, 1987 through 1990, the number of independent contractor employee fatalities increased to an average of approximately 17% of the mining industry. In one year, 1988, independent contractor employees accounted for nearly one-fourth of all mining industry fatalities.

Table 8.—Mining industry fatalities from 1983 through 1990

Year	Operators	Contractors	Total	Contractors, % of total
1983	120	12	132	9
1984	188	18	206	9
1985	107	17	124	14
1986	127	9	136	7
1987	113	17	130	13
1988	78	23	101	23
1989	99	17	116	15
1990	103	19	122	16

COMPARISON OF FATALITY INCIDENCE RATES FOR ALL MINING, 1983-90

All mining fatality incidence rates for independent contractor and operator employees are shown in figure 10. With little exception, the rankings of the fatality incidence rates for each category of mining remained consistent from 1983 through 1990. That is, the fatality incidence rates of metal-nonmetal operator employees remained lower than those of any other category for these years; coal operator employees had the next highest rates. These were exceeded, in order, by coal and metal-nonmetal independent contractor employees. The latter experienced the highest annual *all mining* fatality incidence rates in every year but one.

The fatality incidence rates for independent contractor employees were much higher than those of operator employees from 1983 through 1990. Further, the rate was higher in metal-nonmetal mining than in coal mining. For example, in metal-nonmetal mining during 1990, the fatality incidence rate for independent contractor employees was nearly five times higher than the rate for operator employees. In 1989, the rate was nearly four times as high. But, in coal mining, the rates averaged about twice as high for each of these years.

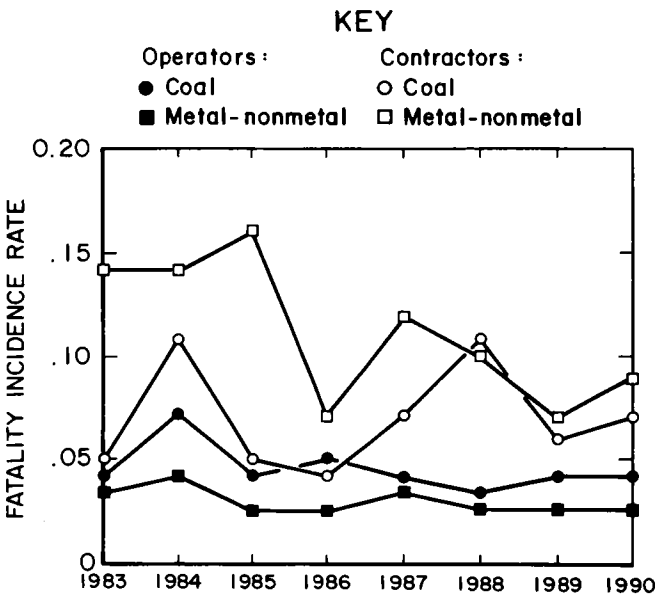

Figure 10.—*All mining* fatality incidence rates for independent contractor and operator employees from 1983 through 1990.

FATALITY INJURY DATA FOR INDEPENDENT CONTRACTOR EMPLOYEES

This section presents fatality injury data for independent contractor employees. The first three areas relate to demographic aspects of the population of fatally injured independent contractor employees from 1983 through 1990. The last five areas address the number of independent contractor employee fatalities by location, by location at work site, by accident classification, by accident classification category and location, and by number of hours worked into a shift prior to fatality. All of the data used in this section were obtained from individual MSHA investigation reports of independent contractor employee fatalities reported between 1983 and 1990. All of these reports are not available at this time. However, the information presented represents a sample size (100 reports) large enough to accurately project independent contractor fatality trends and demographic profiles.

The following data are useful for recognizing trends and patterns that may exist. However, one must be careful when attempting to generalize this information to the entire independent contractor population. Data are not now captured that indicate the total number of independent contractors working in any particular area (occupation, service area, experience, age, etc.). Likewise, the number of hours of exposure to a specific risk is not available, thus preventing normalization of data obtained from a sample.

DEMOGRAPHIC INFORMATION

Age, mining experience, and experience in job classification for fatally injured independent contractor employees are presented in the next three sections. The mean of this demographic information suggests that the profile of a typical fatally injured independent contractor employee was a 35.5-year-old person with 7.9 years mining experience, 8 years experience in his or her job classification, and 4.8 years in the job classification for a particular contracting company.

Age, 1983-90

Figure 11 shows the ages of fatally injured independent contractor employees for the years 1983 through 1990. The mean age of these employees is 35.5 years. Over half (56.1%) of the fatalities occurred, however, to independent contractor employees between the ages of 20 and 35.

Mining Experience, 1983-90

The range of independent contractor employees' total mining experience for those fatally injured during the years 1983 through 1990 was less than 1 h to more than 50 years. Figure 12 shows the total mining experience of these employees. Over half (59.7%) of these fatalities had mining experience of 5 years or less. Figure 13 shows a breakdown of the *5 years or less* group. About three-quarters (76.1%) of the fatalities in this group had mining experience of 2 years or less.

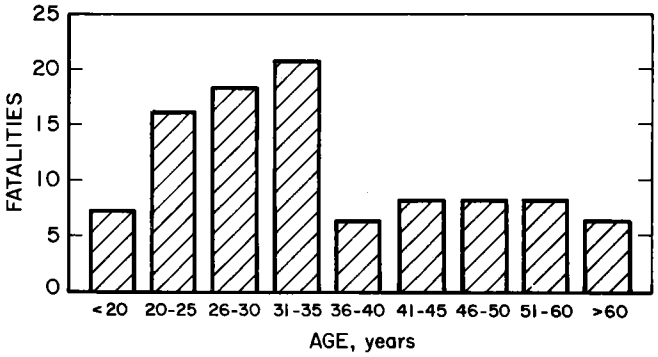

Figure 11.—Ages of fatally injured independent contractor employees during the years 1983 through 1990.

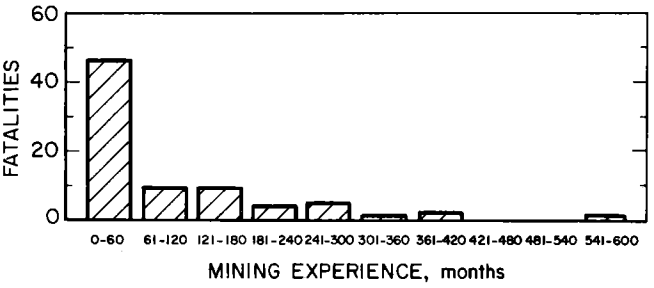

Figure 12.—Total mining experience of independent contractor employees prior to fatality from 1983 through 1990.

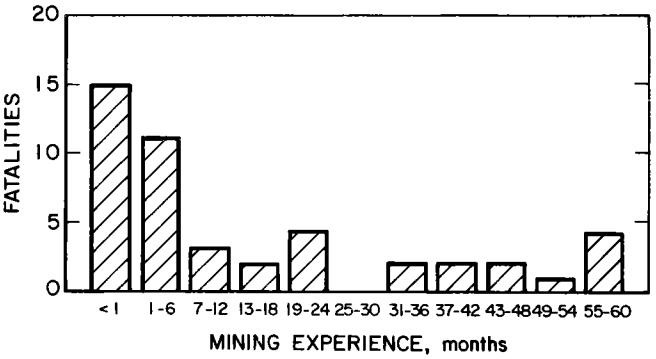

Figure 13.—Number of fatally injured independent contractor employees with *5 years or less* mining experience from 1983 through 1990.

Experience in Job Classification, 1983-90

Figure 14 shows the time in job classification with the independent contractor company prior to the fatality for the years 1983 through 1990. Over three-fourths (83%) of these fatalities were to persons with experience in their job classifications of 5 years or less. A further breakdown of this *5 years or less* group is shown in figure 15. Approximately 85% of the fatally injured independent contractor employees in this latter group had experience in their job classification with that contractor company of 2 years or less.

Figure 16 shows specific job classifications of independent contractor employees prior to the fatality for the years 1983 through 1990. The job classification in which the largest number of fatalities occurred was truck driver. The second highest number of fatalities occurred to equipment operators. The category of equipment operator includes drill operator, bulldozer operator, crane operator, frontend loader operator, hoist operator, power shovel operator, and equipment operators not elsewhere classified. Combined, these two job classifications represented 37% of all the independent contractor employee fatalities during the eight years. The "other" job classification category includes occupations such as divers, blaster helpers, oiler and greaseman, carpenter, superintendent, owner, and others not elsewhere classified.

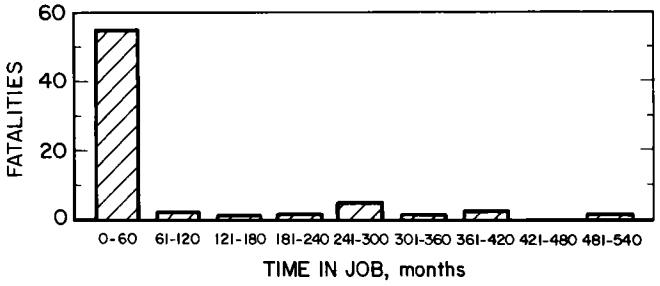

Figure 14.—Time in job classification for independent contractor employees prior to fatality from 1983 through 1990.

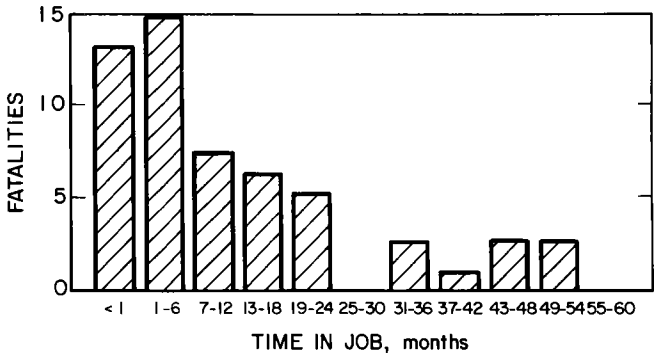

Figure 15.—Number of fatally injured independent contractor employees with *5 years or less* total time in job classification from 1983 through 1990.

NUMBER OF FATALITIES BY LOCATION, 1983-90

During the years 1983 through 1990, the majority of the sample independent contractor employee fatalities, approximately 56%, occurred at surface mines. Preparation plants and mills accounted for almost 26% of these fatalities, and underground locations represented over 18% of them. Nearly 82% of these fatalities occurred at surface operations, that is, at surface mines, prep plants, and mills. Fatalities at surface areas of underground mines are included in underground locations. Figure 17 shows the percentage of independent contractor employee fatalities by location.

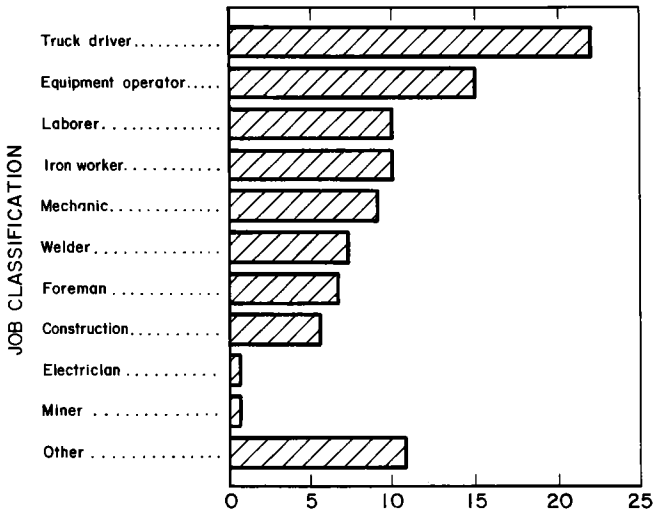

Figure 16.—Number of independent contractor employees within specific job classifications prior to fatality from 1983 through 1990.

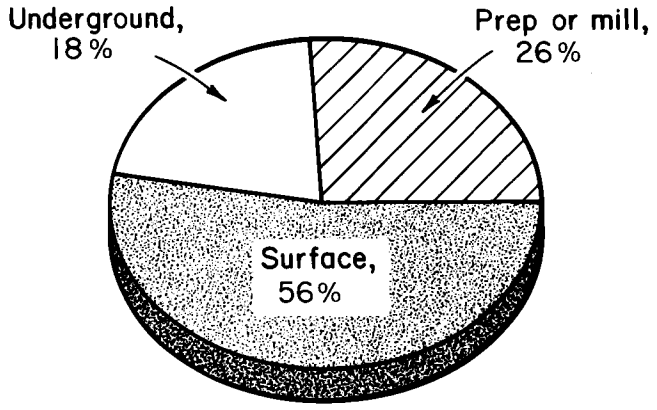

Figure 17.—Independent contractor employee fatalities by location from 1983 through 1990.

Table 9 shows the number of independent contractor employee fatalities with regard to location and industry. Surface mines experienced the highest number of fatalities during the years 1983 through 1990. The number of independent contractor employees working at coal and at metal-nonmetal surface mines was about the same (table 2). However, over half of surface fatalities, nearly 57%, occurred at metal-nonmetal mines.

Table 9.—Number of independent contractor employee fatalities by location and industry from 1983 through 1990

Year and industry	Underground	Surface	Prep plant or mill[1]
1983:			
Coal	3	0	0
Metal-nonmetal	2	2	3
1984:			
Coal	3	4	1
Metal-nonmetal	0	5	3
1985:			
Coal	0	4	0
Metal-nonmetal	1	4	2
1986:			
Coal	0	2	1
Metal-nonmetal	0	0	3
1987:			
Coal	1	1	0
Metal-nonmetal	2	4	1
1988:			
Coal	0	7	1
Metal-nonmetal	1	6	2
1989:			
Coal	0	3	2
Metal-nonmetal	1	5	2
1990:			
Coal	3	3	1
Metal-nonmetal	1	6	4
Total	18	56	26

[1]Prep plant for coal production, mill for metal-nonmetal production.

Preparation plants and mills had the second highest number of independent contractor employee fatalities. Of 26 fatalities at these locations, almost 77% of them occurred at mills. At underground mines, although there were approximately twice the number of independent contractor employees working in coal than in metal-nonmetal (table 2), the number of fatalities was approximately the same for both groups.

NUMBER OF FATALITIES BY LOCATION AT WORK SITE, 1983-90

Figure 18 shows the work sites of surface, underground, prep plant, and mill locations where independent contractor employee fatalities occurred during the years 1983 through 1990. The sites represent both coal and metal-nonmetal mining. The particular work sites where the majority of fatalities occurred were mill or prep and roadway. Examples of roadway fatalities were drivers of haulage trucks, diesel delivery trucks, water trucks, and mobile equipment. Examples of the "other" categories of work sites include areas where persons were struck by lightning, hit by flyrock, conducting logging (tree removal) activities, and surveying.

NUMBER OF FATALITIES BY ACCIDENT CLASSIFICATION, 1983-90

Four accident classifications represented 71% of the independent contractor employee fatalities from 1983 through 1990. These accident classifications were (1) powered haulage, (2) slips and falls, (3) machinery, and (4) electrical. Figure 19 shows the number of fatalities in each accident classification group. Examples of the "other" accident classification category are noted in the next section.

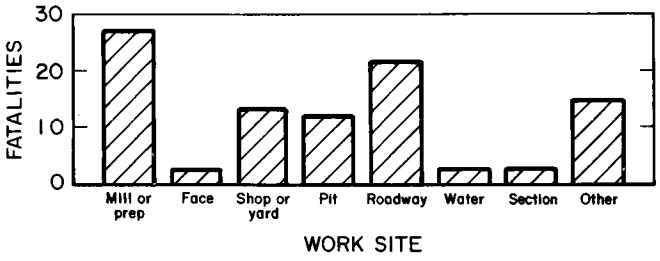

Figure 18.—Independent contractor employee fatalities by work site for all mining from 1983 through 1990.

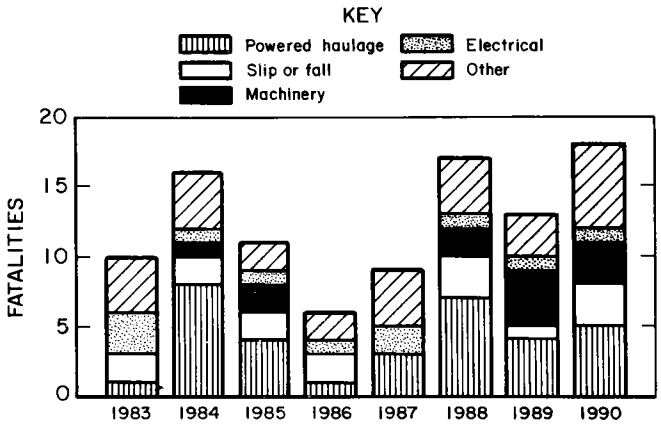

Figure 19.—Independent contractor employee fatalities by accident classification for all mining from 1983 through 1990.

NUMBER OF FATALITIES BY ACCIDENT CLASSIFICATION CATEGORY AND LOCATION, 1983-90

Table 10 lists all accident classification categories by location of independent contractor employee fatalities during the years 1983 through 1990. The four accident classifications that accounted for the majority of independent contractor employee fatalities (noted in the previous section) are also included in the list. In addition to these, the next most common accident classification categories was sliding materials.

NUMBER OF HOURS WORKED INTO A SHIFT PRIOR TO FATALITY, 1983-90

Figure 20 shows the number of hours independent contractor employees worked into a shift prior to the fatality from 1983 through 1990. The number of fatalities occurring at whole-hour intervals into a shift is somewhat evenly distributed throughout the shift, at least through the first 9 h. The largest number of fatalities to independent contractor employees occurred in the second hour of the shift.

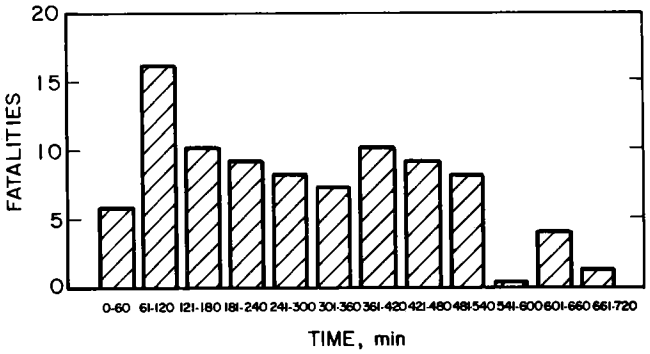

Figure 20.—Minutes worked into a shift prior to independent contractor employee fatality for all mining from 1983 through 1990.

Table 10.—Number of independent contractor employee fatalities by accident category and location for all mining from 1983 through 1990

Accident category	Coal			Metal-nonmetal		
	Underground	Surface	Prep plant	Underground	Surface	Mill
Power haulage	2	14	2	1	12	2
Machinery	1	3	1	1	3	3
Slips and falls	1	2	1	1	2	8
Electrical	3	1	0	1	4	2
Sliding material	0	1	2	1	4	1
Fall of face	0	2	0	2	1	0
Roof fall	1	0	0	0	0	0
Hoisting	1	0	0	1	0	0
Material handling	0	1	0	0	1	1
Exploding vessel	0	0	0	0	1	0
Ignitions and explosions	0	0	0	0	2	0
Hand tools	0	0	0	0	0	1
Other	1	0	0	0	2	2
Total	10	24	6	8	32	20

SUMMARY

Economic constraints have impelled mine operators to depend more and more on independent contractor personnel to augment their work force. According to mining industry employee data reported to MSHA, the number of independent contractor employees working at all locations in both coal and metal-nonmetal mines more than doubled between 1983 and 1990. This increase was most apparent at "metal-nonmetal, surface" locations.

Incidence rates, which normalize injury data based on 200,000 employee hours worked, are used to offer a generic picture of the status of injuries to independent contractor employees. The *all occurrences* (combined *no days lost, nonfatal days lost,* and *fatal* injuries) incidence rates for independent contractor employees indicate that prep plants and mills experienced the highest average rates from 1983 through 1990. These were followed in descending order by "coal, underground," "metal-nonmetal, underground" and, then, surface for both industries. Approximately 70% of the *all occurrences* injuries at all locations were attributed to the following accident classifications: material handling, machinery, and slips and falls.

A total of 132 fatalities occurred to independent contractor employees from 1983 through 1990. The fatality incidence rates for independent contractor employees during these years were much higher than for mine operator employees. In 1990, the rate for metal-nonmetal mining was nearly five times higher, and in coal the rate was twice as high. The majority of these fatalities, almost 56%, occurred to employees working at surface mines. The fatality injury data for independent contractor employees from 1983 through 1990 also show that over half (59.7%) of the fatalities involved employees with total mining experience of 5 years or less. And, over three-fourths (83.1%) of independent contractor employee fatalities occurred to those with 5 years or less experience in their job classifications with that contractor company. Finally, the fatality injury data show that the majority of the fatalities occurred to independent contractor employees in just four accident classifications: powered haulage, slips and falls, machinery, and electrical.

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