

## A REVIEW OF INDEPENDENT CONTRACTOR FATALITY DATA FROM 1983 THROUGH 1990

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### ABSTRACT

Fatality data for independent contractors working at coal and metal/nonmetal mines from 1983 through 1990 are reviewed. Fatality data for operators are also presented for comparison.

During these years, there were 132 independent contractor employee fatalities. These accounted for an average of more than 13% of all fatalities in the mining industry. In 1988, independent contractors represented just 9.9% of the mining work force, however, they were responsible for nearly 23% of the mining industry fatalities. Moreover, their fatality incidence rates from 1983 through 1990 were consistently higher than those for operators at all locations of both coal and metal/nonmetal mines.

Some trends observed in looking at a representative sample of the independent contractor fatality data during the eight-year period were: (1) more than half of the workers who were fatally injured had five or fewer years of mining experience; (2) 83% of them had experience of five or fewer years in their particular job classification with the independent contractor employer; (3) 82% of

the fatalities occurred at surface locations; (4) two job classifications - truck driver and equipment operator - accounted for 37% of the fatalities; and (5) 71% of the fatalities occurred in just four accident classifications - powered haulage, slips/falls, machinery and electrical.

### INTRODUCTION

Components of the mining work force have changed considerably in recent years. The number of independent contractor personnel working in a variety of everyday production and support services has increased and, at the same time, the number of operator personnel has decreased. From 1983 through 1990, independent contractor employees in coal and metal/nonmetal mining, both surface and underground, nearly doubled, but the number of operator employees decreased by approximately nine percent. Table 1 shows how the mining work force changed with respect to industry and location during the eight-year period.

The largest growth of independent contractors from 1983 through 1990 occurred in the metal/nonmetal mining industry. Metal/nonmetal mills (+224%) and surface

Table 1 - Number of independent contractor and operator employees  
by industry and location from 1983 through 1990

**COAL**

| Year | Operator    | Independent Contractor | Operator | Independent Contractor | Operator   | Independent Contractor |
|------|-------------|------------------------|----------|------------------------|------------|------------------------|
|      | Underground |                        | Surface  |                        | Prep Plant |                        |
| 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**

| Year | Operator    | Independent Contractor | Operator | Independent Contractor | Operator | Independent Contractor |
|------|-------------|------------------------|----------|------------------------|----------|------------------------|
|      | Underground |                        | Surface  |                        | Mill     |                        |
| 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                  |

mines (+136%) showed the greatest increases. Underground coal mining ranked a close third (+129%) on the list during these years. Table 2 shows the percent of change and the relative rankings for each industry/location segment of the mining industry.

In spite of this growth, the percentage of independent contractor employees still remained relatively small as compared with the total number of workers in the mining industry. In 1983, independent contractors represented approximately 6% of the mining work force; in 1990, the number grew to approximately 13% of the work force.

Table 2 - Percent change in the number of independent contractor employees from 1983 through 1990

| Rank | Industry/Location | Percent Change |
|------|-------------------|----------------|
| #1   | MNM/Mills         | +224%          |
| #2   | MNM/Surface       | +136%          |
| #3   | Coal/Underground  | +129%          |
| #4   | Coal/Surface      | + 85%          |
| #5   | Coal/Prep plant   | + 45%          |
| #6   | MNM/Underground   | - 15%          |

Note: (+) denotes an increase, (-) denotes a decrease

Who are independent contractors? The Mine Safety and Health Administration (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" (1).<sup>1</sup> Mine operators employ them to perform a variety of production and support services. Some common independent contractor occupations include: security guards, supervisors, truck drivers, technicians, production workers, chemists, drillers and blasters, construction workers, equipment operators, iron workers, and mechanics.

Other employees, perhaps in the same job classifications above, who work for contract mines and 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 on the parent company payroll, in effect, have permanent jobs with that company, at least for the life of the contract. Injuries to these workers are reported to MSHA by the parent company and are classified as operator

injuries. MSHA injury data for employees working at contract mines is incorporated with injury data for operators. Companies that are hired by the contract mine operator to perform specific tasks, however, are classified as independent contractor companies.

Traditionally, both independent contractor and operator injury data are reported in a combined format that represents the general mining work force. The purpose of this paper is to report mining industry fatality data for independent contractors. Some operators' fatality data, however, are also presented so the reader can discern how independent contractors compare with that segment of the industry. Fatality information on certain independent contractor demographic and accident characteristics is reviewed for trends and patterns which the data describes. Information is presented using tables and graphs that depict fatality data over an eight-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 MSHA's Safety and Health Technology Center Accident and Injury Data Base; and (3) official MSHA accident investigation reports.

#### FATALITY DATA FOR INDEPENDENT CONTRACTOR AND OPERATOR EMPLOYEES

Independent contractor employees averaged approximately 8.7% of the mining work force during the years 1983 through 1990 (Table 3). However, their *all mining* fatalities averaged a disproportionately higher 13.1% of the industry during this time (Table 4). The term *all mining* refers to both coal and metal/nonmetal mining at surface, underground, prep plant, and mill locations.

However, during the last four years, 1987 through 1990, the averages were 10.7% and 16.7%. In one year alone, 1988, 9.9% of the mining work force accounted for nearly 23% of all mining industry fatalities. Overall, independent contractors were responsible for a disproportionate share of mining industry fatalities over the eight-year period.

<sup>1</sup>Italic numbers in parentheses refer to references at the end of this report.

Table 3 - Independent contractor's percent of  
*all mining* industry work force

| Year | All Mining Work Force | Independent Contractors | Independent Contractors, % Of Total |
|------|-----------------------|-------------------------|-------------------------------------|
| 1983 | 372,623               | 22,665                  | 6.1                                 |
| 1984 | 386,787               | 24,259                  | 6.3                                 |
| 1985 | 375,202               | 26,947                  | 7.2                                 |
| 1986 | 357,023               | 26,768                  | 7.5                                 |
| 1987 | 348,239               | 28,763                  | 8.3                                 |
| 1988 | 353,165               | 35,119                  | 9.9                                 |
| 1989 | 359,028               | 42,475                  | 11.8                                |
| 1990 | 363,184               | 45,985                  | 12.7                                |

Table 4 - *All mining* industry fatalities  
from 1983 through 1990

|      | Operators | Contractors | Total | Contractors, % of Total |
|------|-----------|-------------|-------|-------------------------|
| 1983 | 120       | 12          | 132   | 9.1%                    |
| 1984 | 188       | 18          | 206   | 8.7%                    |
| 1985 | 107       | 17          | 124   | 13.7%                   |
| 1986 | 127       | 9           | 136   | 6.6%                    |
| 1987 | 113       | 17          | 130   | 13.1%                   |
| 1988 | 78        | 23          | 101   | 22.8%                   |
| 1989 | 99        | 17          | 116   | 14.7%                   |
| 1990 | 103       | 19          | 122   | 15.6%                   |

*All mining* fatality incidence rates for independent contractor and operator employees are shown in Figure 1. With two exceptions, the relative order of the fatality incidence rates for each industry/segment remained consistent from 1983 through 1990. In other words, the fatality incidence rates of "metal/nonmetal, operator" employees remained lowest for these years; "coal, operator" employees had the next highest rates. These were exceeded, in order, by "coal, independent contractor" and "metal/nonmetal, independent contractor" employees. This last industry/segment group of workers experienced the highest annual *all*

*mining* fatality incidence rates in every year except 1988. The two exceptions noted above were (1) in 1986 when "coal, operators" and "metal/nonmetal, operators" reversed their positions and (2) in 1988 when "coal, independent contractors" and "metal/nonmetal, independent contractors" changed their order.

The fatality incidence rates for independent contractor employees were higher than those of operator employees for every year except 1986 where "coal operators" exceeded "coal, independent contractors." In 1990, the rate for independent contractor employees in

metal/nonmetal mining was nearly five times higher than for operator employees.

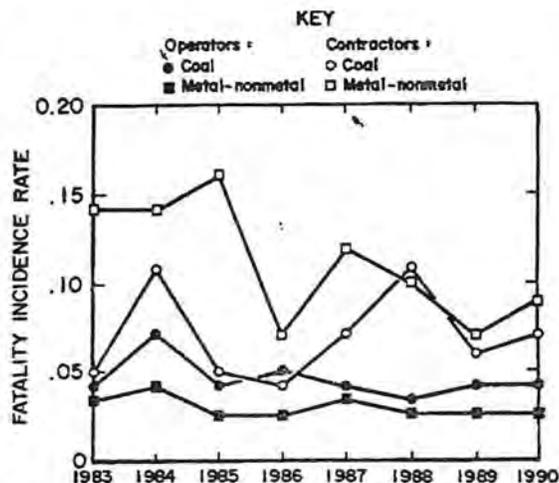


Figure 1.--Fatality incidence rates for independent contractors and operators

#### FATALITY DATA FOR INDEPENDENT CONTRACTOR EMPLOYEES

Several arbitrarily chosen demographic and accident characteristics of independent contractor fatalities from 1983 through 1990 are reviewed in this section. The objective was to look for trends that characterize this segment of the mining work force. Data was acquired from a sample of 100 (out of 132) MSHA independent contractor fatality investigation reports. Because a form of nonprobability sampling was used to select data, it is difficult to generalize from the results of its analysis (2). The sample results are also not generalized because the number of independent contractor employee exposure hours to specific risks is not available. Despite these limitations, the sample selected for review can be used for observing and reporting trends which developed during the eight-year period.

The *demographic characteristics* considered for review include the continuous variables of age, mining experience, job classification with independent contractor employer, and experience in job classification with independent contractor employer. The *accident characteristics* include accident location and accident classification.

#### DEMOGRAPHIC CHARACTERISTICS

Age - The age distribution of the independent contractor employee fatalities in the sample are shown in Figure 2. More than one-half (56.1%) of the fatalities occurred to workers under 35 years of age, and the majority of them were between the ages of 20 and 35. The mean age of the sample is 35.5 years.

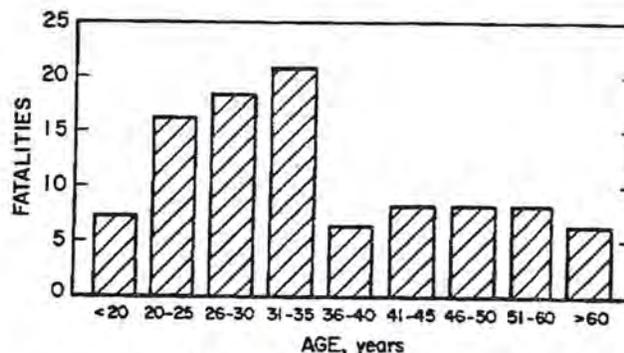


Figure 2.--Ages of independent contractor fatalities, 1983-90

Mining experience - The range of mining experience for independent contractor employees who were fatally injured from 1983 through 1990 was less than one hour to more than 50 years. Figure 3 shows the distribution of mining experience for these employees. More than half (59.7%) of the fatalities in the sample had 5 or fewer years of mining experience. A further breakdown of this "5 or fewer years" subgroup, shown in Figure 4, indicates that over three-fourths (76.1%) of these fatalities had two or fewer years of mining experience. Further, in this "2 or fewer

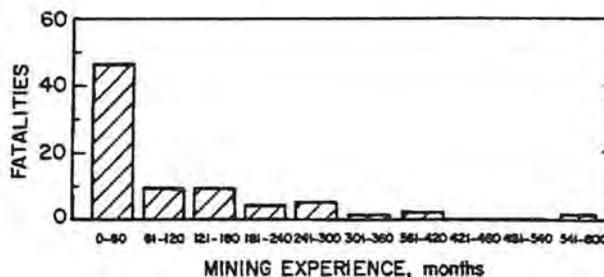
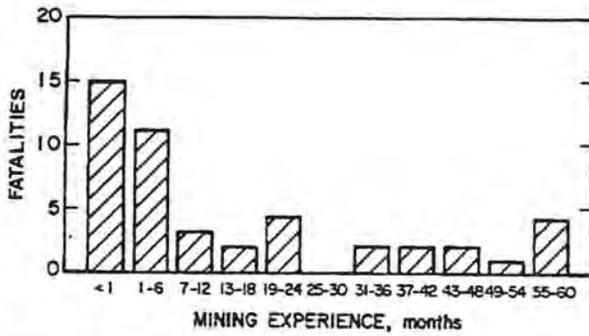


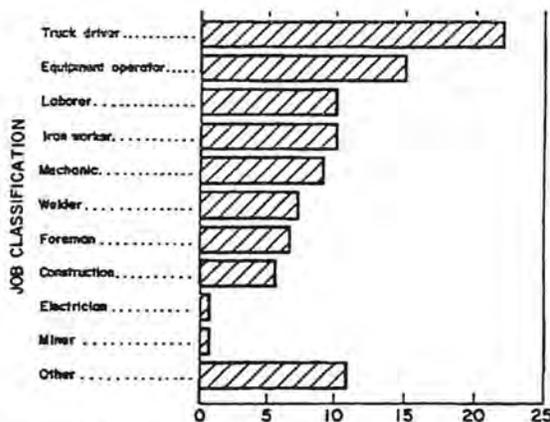
Figure 3.--Total mining experience of independent contractor fatalities, 1983-90



**Figure 4.--Independent contractor fatalities with "5 or fewer years" total mining experience, 1983-90**

years" mining experience subgroup, 27 of 36 fatalities occurred to independent contractor employees with 6 or fewer months of mining experience.

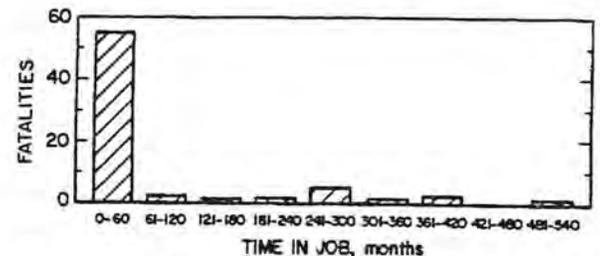
Job classification with independent contractor employer - Figure 5 shows the specific independent contractor employee job classifications (occupation titles) at the time of the fatality. The job classification in which the largest number of fatalities occurred was truck driver (22). The second highest number of fatalities occurred to equipment operators (15). Equipment operators include: drill operator, bulldozer operator, crane operator, front-end loader operator, hoist operator, power shovel operator and equipment operators not elsewhere classified. Combined, truck drivers and equipment operators accounted for 37% of the independent contractor employee fatalities in



**Figure 5.--Job classifications of independent contractor fatalities, 1983-90**

the sample during the eight-year period. The "other" job classification category in figure 5 includes such occupations titles as diver, blaster helper, oiler/greaseman, carpenter, superintendent, and owner.

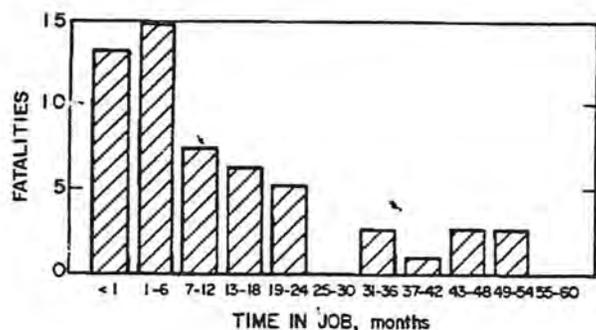
Experience in job classification with independent contractor employer - This demographic characteristic relates to the amount of employment time (experience) the individual had in his/her specific job classification with the independent contractor. Figure 6 shows the distribution of experience in job classification for 1983 through 1990. More than three-fourths (83%) of the fatalities were to persons with experience in their job classifications with that particular employer of 5 or fewer years. A further breakdown of this "5 or fewer years" subgroup, shown in Figure 7, indicates that approximately 85% of these fatalities had experience in their job classification with that independent contractor employer of 2 or fewer years. Further, in this "2 or fewer years" subgroup, 28 of 46 fatalities occurred to independent contractor employees with 6 or fewer months of experience in their job classification with that independent contractor employer.



**Figure 6.--Experience in job classification with independent contractor prior to fatality 1983-90**

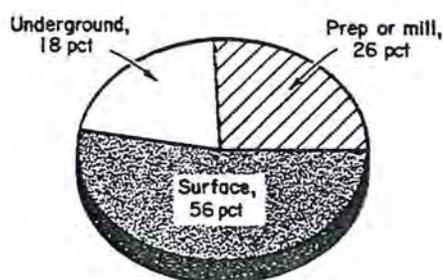
### ACCIDENT CHARACTERISTICS

Accident Location - In the sample of 100 fatalities, the location in which the largest number of independent contractor fatalities occurred was surface mines, 56%. Preparation plants and mills accounted for another 26% of the fatalities, and 18% of them occurred at underground locations. A total of 82% of these



**Figure 7.--Fatalities with "5 or fewer years" experience in job classification with independent contractor, 1983-90**

fatalities, therefore, occurred at surface operations, that is, at surface mines, prep plants, and mills. [Fatalities at surface areas of underground mines were included in underground data] Figure 8 shows the percentage of independent contractor employee fatalities by location from 1983 through 1990.



**Figure 8.--Locations of independent contractor fatalities, 1983-90**

Table 5 lists the independent contractor employee fatalities in the sample of 100 with regard to location and industry. Even though the number of independent contractor employees working at coal and at metal/nonmetal surface mines was nearly the same (determined from Table 2), over half of the surface fatalities, 32 of 56, occurred at metal/nonmetal mines.

Preparation plants and mills, the locations of the second highest number of independent

**Table 5 - Number of independent contractor employee fatalities by location and industry from 1983 through 1990**

|                      | Underground | Surface | Prep/Mill |
|----------------------|-------------|---------|-----------|
| 1983<br>COAL<br>M/NM | 3<br>2      | 2       | 3         |
| 1984<br>COAL<br>M/NM | 3           | 4<br>5  | 1<br>3    |
| 1985<br>COAL<br>M/NM | 1           | 4<br>4  | 2         |
| 1986<br>COAL<br>M/NM |             | 2       | 1<br>3    |
| 1987<br>COAL<br>M/NM | 1<br>2      | 1<br>4  | 1         |
| 1988<br>COAL<br>M/NM | 1           | 7<br>6  | 1<br>2    |
| 1989<br>COAL<br>M/NM | 1           | 3<br>5  | 2<br>2    |
| 1990<br>COAL<br>M/NM | 3<br>1      | 3<br>6  | 1<br>4    |
| TOTALS               | 18          | 56      | 26        |

contractor employee fatalities, accounted for 26 fatalities and 20 of these occurred at mills. At underground mines, although there were approximately twice the number of independent contractor employees working in coal than in metal/nonmetal (from Table 2), the number of fatalities was approximately the same for both groups.

**Accident classification** - Four accident classifications (types) accounted for 71% of the independent contractor employee fatalities in the sample. They included (1) powered haulage, (2) slips/falls, (3) machinery and (4) electrical. Figure 9 shows the number of fatalities in each accident classification group.

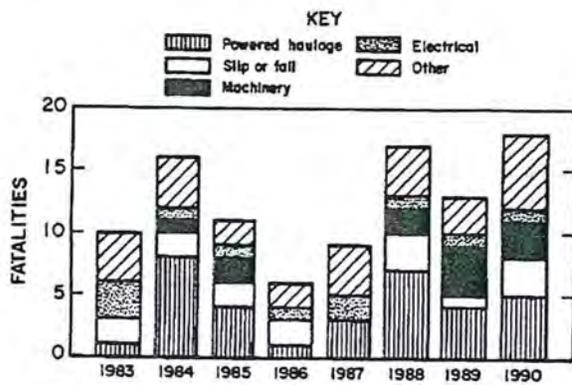


Figure 9.--Accident classifications of independent contractor fatalities, 1983-90

Table 6 lists the *all mining* accident classifications in the sample by location. In addition to the four accident classifications which accounted for the majority of independent contractor fatalities, the fifth most common accident category was "sliding materials".

#### SUMMARY

For a variety of reasons, independent contractors have become a major component of the mining work force. From 1983 through 1990, the combined number of workers - operators and independent contractors -

Table 6 - Independent contractor employee fatalities by accident type and location for *all mining* from 1983 through 1990

|                    | Coal     |         |      | Metal/Nonmetal |         |      |
|--------------------|----------|---------|------|----------------|---------|------|
|                    | Undergrd | Surface | Prep | Undergrd       | Surface | Mill |
| Power Haulage      | 2        | 14      | 2    | 1              | 12      | 2    |
| Machinery          | 1        | 3       | 1    | 1              | 3       | 3    |
| Slip/Fall          | 1        | 2       | 1    | 1              | 2       | 8    |
| Electrical         | 3        | 1       |      | 1              | 4       | 2    |
| Sliding Material   |          | 1       | 2    | 1              | 4       | 1    |
| Fall of face       |          | 2       |      | 2              | 1       |      |
| Roof Fall          | 1        |         |      |                |         |      |
| Hoisting           | 1        |         |      | 1              |         |      |
| Material Handling  |          | 1       |      |                | 1       | 1    |
| Exploding Vessel   |          |         |      |                | 1       |      |
| Ignition/Explosion |          |         |      |                | 2       |      |
| Hand Tools         |          |         |      |                |         | 1    |
| Other              | 1        |         |      |                | 2       | 2    |
| TOTALS             | 10       | 24      | 6    | 8              | 32      | 20   |

remained relatively constant, but the number of independent contractor employees more than doubled. Along with this increase in workers came increased fatalities and fatality incidence rates that were much higher for independent contractors than for operators. A total of 132 fatalities occurred to independent contractor employees from 1983 through 1990. During these years, 8.7% of the mining work force were responsible for more than 13% of all mining industry fatalities.

In looking at a representative sample of these fatalities, several important trends were observed. More than half of the workers who were fatally injured had five or fewer years of mining experience, and three-fourths of this subgroup had two or fewer years of mining experience. More than one-third of the fatalities occurred to workers in two job classifications: truck driver and equipment operator. A large majority of the sample, 83%, had experience in their particular job classification with the independent contractor employer of five or fewer years. And, in this subgroup, half of them had such experience of six or fewer months. Most of the fatalities (82%) occurred at surface operations - surface mines, prep plants, and mills. And finally, four types of accidents accounted for 71% of the independent contractor fatalities in the sample:

powered haulage, slips/falls, machinery, and electrical.

The safety of independent contractors is a major concern to mine operators and regulatory enforcement personnel throughout the mining industry. The fatality data reported in this paper indicate some of the areas where problems occurred during an eight-year period.

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