

PRELIMINARY REGULATORY ECONOMIC ANALYSIS

FOR

PROPOSED RULE ON MINE RESCUE TEAMS

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I. EXECUTIVE SUMMARY

INTRODUCTION

This Preliminary Regulatory Economic Analysis (PREA) examines the costs and benefits of MSHA's proposed rule to revise MSHA's existing standards for mine rescue teams for underground coal mines. The proposed rule would strengthen training requirements and address composition, availability, and certification requirements for coal mine rescue teams.

MINE SECTOR AFFECTED

The proposed rule would be applicable to all underground coal mines. Chapter II of this PREA provides a description of the underground coal mine sector. The proposed rule would cover all mine rescue teams, including State teams (State-sponsored teams), that provide coverage to underground coal mines.

POPULATION AT RISK

The proposed rule would apply to 653 underground coal mines and cover the 42,597 miners and 8,250 (non-office) contractors working at these mines.

BENEFITS SUMMARY

The proposed rule would implement Section 4 of the Mine Improvement and New Emergency Response (MINER) Act of 2006, signed by the President on June 15, 2006. In Chapter III of this PREA, MSHA has qualitatively determined that the proposed rule would enable coal mine rescue teams to respond more quickly in emergencies when a quick response by rescue teams is vital to the safety and health of miners. The purpose of this proposed rule is to enhance the availability and effectiveness of mine rescue teams in the event of an emergency or disaster-type situation at an underground coal mine.

Mine operators often rely on mine rescue teams to save miners during an underground emergency, such as an explosion, fire, roof fall, or water inundation. In such situations, the timely response of a properly-trained mine rescue team could mean the difference between life and death.

COMPLIANCE COST SUMMARY

MSHA estimates that the proposed rule would result in total yearly costs for the underground coal mining industry of approximately \$3.0 million. Disaggregated by mine size, yearly costs would be \$0.7 million (or approximately \$3,000 per mine) for mine operators with fewer than 20 employees; \$2.2 million (or about \$5,300 per mine) for mine operators with 20-500 employees; and \$0.1 million (or about \$7,000 per mine) for mine operators with more than 500 employees. In addition, the proposed rule would indirectly impose total costs on States that provide mine rescue services of approximately \$0.1 million.

REGULATORY FLEXIBILITY CERTIFICATION AND ANALYSIS

In accordance with § 605 of the Regulatory Flexibility Act (RFA), MSHA certifies that the proposed rule would not have a significant economic impact on a substantial number of small entities. Under the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the RFA, MSHA must include in the proposed rule a factual basis for this certification. The analysis that provides the factual basis for this certification is discussed in Chapter V of this document and in the preamble to the proposed rule published in the *Federal Register*. MSHA has consulted with the Small Business Administration's (SBA's) Office of Advocacy and believes that the analysis provides a reasonable basis for this certification.

II. INDUSTRY PROFILE

INTRODUCTION

This chapter provides information concerning the structure and economic characteristics of the underground coal mining industry, including the number of mines and employees by type and size of mine. The value of the coal output of the U.S. underground coal mining sector was estimated to be approximately \$13.1 billion in 2006.¹

STRUCTURE OF THE MINING INDUSTRY

MSHA divides the mining industry into two major sectors based on commodity: (1) coal mines and (2) metal and nonmetal (M/NM) mines. Each sector is further divided by type of operation (e.g., underground mines or surface mines). The Agency maintains data on the number of mines and on mining employment by mine type and size. MSHA also collects data on the number of independent contractor firms and their employees. Each independent contractor is issued one MSHA contractor identification number (contractor ID) but may work at any mine.

MSHA generally groups mines into three different categories based on total employment: 1-19 employees; 20-500 employees; and 501+ employees. For rulemaking purposes, the Agency has traditionally defined a small mine to be one employing 1-19 employees and a large mine to be one employing 20 or more employees. However, to comply with the requirements of the SBREFA amendments to the RFA, MSHA also uses SBA's definition for a small entity when determining a rule's economic impact. For the mining industry, SBA defines a small mine as one with 1-500 employees and a large mine as one with 501+ employees.

STRUCTURE OF THE COAL MINING INDUSTRY

The proposed rule is applicable to underground coal mines only. Table II-1 presents the total number of underground coal mines, by employment size, excluding contractors.

Agency data in Table II-1 indicate that there were 653 underground coal mines that reported employment during some portion of calendar year 2006. Underground coal mines employed 42,597 miners and 1,188 office employees in 2006. In addition, 8,250 (non-office) contractor employees worked at underground coal mines in 2006 (of which 4,096 worked underground).

¹ Coal production data are from U.S. Department of Labor (DOL), Mine Safety and Health Administration (MSHA), Office of Program Evaluation and Information Resources (PEIR), 2006 data, March 27, 2007 Teradata run. Estimated coal revenue in 2006 is based on 2005 coal prices. The average U.S. price of underground coal for 2005 is from the Department of Energy (DOE), Energy Information Administration (EIA), *Annual Coal Report 2005*, October 2006, Table 28, page 56.

Table II-1: Distribution of the Number of Underground Coal Mines (Excluding Contractors), by Employment Size, 2006

Size of Underground Coal Mines									All Underground Coal Mines		
1-19			20-500			501+			Mines	Miners	Office Empl.
Mines	Miners	Office Empl.	Mines	Miners	Office Empl.	Mines	Miners	Office Empl.			
220	2,255	73	420	32,852	969	13	7,490	146	653	42,597	1,188

Source: U.S. DOL, MSHA, PEIR, based on 2006 data, March 27, 2007.

Table II-2 presents data on the number of independent contractors that worked in underground coal mines in 2006.

Table II-2: Distribution of the Number of Underground Coal Contractors, by Employment Size, 2006

Size of Contractor at Underground Coal Mines									All Contractors at Underground Coal Mines		
1-19			20-500			501+			Independent Contractors	Non-Office Empl.	Office Empl.
Independent Contractors	Non-Office Empl.	Office Empl.	Independent Contractors	Non-Office Empl.	Office Empl.	Independent Contractors	Non-Office Empl.	Office Empl.			
197	1,386	56	84	6,864	206	0	0	0	281	8,250	262

Source: U.S. DOL, MSHA, PEIR, based on 2006 data, March 27, 2007.

ECONOMIC CHARACTERISTICS OF THE COAL MINING INDUSTRY

MSHA classifies the U.S. coal mining sector into three major commodity groups: bituminous, lignite, and anthracite.² Bituminous operations represent approximately 91 percent of coal mining operations, employ 94 percent of all coal miners, and account for 93 percent of total coal production. Lignite operations represent approximately 1 percent of coal mining operations, employ 4 percent of all coal miners, and account for 7 percent of total coal production. Anthracite operations represent approximately 7 percent of coal mining operations, employ 1 percent of all coal miners, and account for 0.1 percent of total coal production.³

The U.S. underground coal sector produced an estimated 0.359 billion tons of coal in 2006. The average price of coal from underground mines in 2005 was \$36.42 per ton.⁴

² This categorization is based on MSHA-collected data grouped by SIC code description. Some publications from the U.S. Department of Energy further divide the bituminous group into bituminous coal and sub-bituminous coal. Other publications from MSHA combine lignite coal with bituminous coal.

³ Based on 2006 data from U.S. DOL, MSHA, PEIR, March 27, 2007 Teradata run.

⁴ Coal prices are the average open market sales prices for 2005. U.S. DOE, EIA, *Annual Coal Report* 2005, October 2006, Table 28, p. 56.

Mines east of the Mississippi River accounted for approximately 44 percent of coal production in 2005. For the period 1949 through 2005, coal production east of the Mississippi River ranged from a low of 413 million tons in 1960 to a high of 630 million tons in 1990; 2005 production was estimated at 493 million tons. Coal production west of the Mississippi ranged from a low of 21 million tons in 1960 to an estimated record high of 640 million tons in 2005.⁵ Growth in western coal mines is due, in part, to environmental concerns that increase demand for low-sulfur coal, which is abundant in the West. In addition, surface mining, with its higher average productivity, is much more prevalent in the West.

Average domestic coal prices (nominal and real prices) for the period 1950-2005 are presented in Table II-3. The nominal price is the actual price received. The real price is the price adjusted for inflation by using constant dollars from a particular year, which in Table II-3 is the year 2000. During this period, the real price of coal generally declined. The only exceptions were a spike during the OPEC petroleum price increases in the 1970s and increases since 2000. The estimated real price of coal per ton was approximately 31 percent lower in 2005 than in 1950.⁶ The estimated real price of coal per Btu was approximately 15 percent lower in 2005 than in 1950, making coal the least expensive of the major fossil fuels in terms of dollars per btu (British thermal unit).⁷

⁵ U.S. DOE, EIA, *Annual Energy Review 2005*, July 2006, Table 7.2, p. 207.

⁶ *Ibid.*, Table 7.8, p. 219.

⁷ *Ibid.*, Table 3.1, p. 67. Per btu, coal energy was more expensive than natural gas energy in 1950, but since 1979 has been less expensive. Both coal and gas energy were less expensive than crude oil energy in 1950 and have remained less expensive in every year since then.

Table II-3: Coal Prices 1950-2005
(Dollars per Short Ton and Dollars per Million Btu)

Year	Nominal Price (Dollars per Short Ton)	Real Price (Year 2000 Dollars per Short Ton)	Nominal Price (Dollars per Million btu)	Real Price (Year 2000 Dollars per Million btu)
1950	5.19	31.40	0.21	1.25
1955	4.69	25.02	0.19	0.99
1960	4.83	22.96	0.19	0.92
1965	4.55	20.19	0.18	0.82
1970	6.34	23.03	0.27	0.87
1975	19.35	50.92	0.85	2.22
1980	24.65	45.61	1.10	2.04
1985	25.20	36.15	1.15	1.65
1990	21.76	26.67	1.00	1.22
1991	21.49	25.45	0.99	1.17
1992	21.03	24.34	0.97	1.12
1993	19.85	22.46	0.93	1.05
1994	19.41	21.50	0.91	1.01
1995	18.83	20.44	0.88	0.96
1996	18.50	19.71	0.87	0.92
1997	18.14	19.01	0.85	0.89
1998	17.67	18.32	0.83	0.86
1999	16.63	16.99	0.79	0.81
2000	16.78	16.78	0.80	0.80
2001	17.38	16.97	0.83	0.82
2002	17.98	17.26	0.87	0.84
2003	17.85	16.79	0.87	0.82
2004	19.93	18.27	0.98	0.89
2005	24.12	21.51	1.19	1.06

Source: DOE, EIA, *Annual Energy Review 2005*, July 2006, Table 7.8, p. 219; Table 3.1, p. 67.

COAL MINING INDUSTRY OUTLOOK

The U.S. coal industry enjoys a fairly steady domestic demand with approximately 92 percent of U.S. coal demand accounted for by electric power producers in 2005.⁸ Domestic coal demand is projected to increase based on the increase in its use for electricity generation. Coal consumption for electricity generation has been projected to increase on average, by 1.6 percent per year from 2003 to 2025 as the utilization of existing coal-fired generation capacity increases and as new capacity is added.⁹

⁸ U.S. DOE, EIA, *Annual Energy Review 2005*, July 2006, Table 7.3, p. 209.

⁹ U.S. DOE, EIA, *Annual Energy Outlook 2005*. February 2005, p. 108.

III. BENEFITS

The proposed rule would implement Section 4 of the MINER Act. The purpose of the proposed rule is to enhance the availability and effectiveness of mine rescue teams in the event of an emergency situation at an underground coal mine. Mine operators often rely on mine rescue teams to save miners during an underground emergency such as an explosion, fire, roof fall, or water inundation. In such a situation, the timely arrival of a properly-trained mine rescue team could mean the difference between life and death. In most instances, other types of rescue units, e.g., a rescue squad from the local fire department, are unlikely to have the specialized training and equipment to respond effectively to an emergency due to the hazardous nature of the underground coal mine environment.

A good mine rescue team will—

- Have knowledge and familiarity with the mine layout, including the location of working sections, mining equipment, fire-fighting equipment, first aid supplies, transportation, escapeways, and emergency shelters;
- Know the mine's roof conditions and ventilation system; and
- Have an established working relationship with mine management and among the team members.

These factors provide for more efficient decision-making during an emergency and increased confidence in the personnel who implement these decisions.

MSHA has qualitatively determined that the proposed rule would make coal mine rescue teams better able to respond to emergencies when a quick response by rescue teams is vital to the safety and health of miners. The proposed rule would improve overall mine rescue service in three areas:

- (1) It would improve mine emergency response time by requiring that mine rescue team members be available at the mine within one hour ground travel time from the mine rescue station.
- (2) It would increase the quality and effectiveness of training by requiring team members to be familiar with the covered mines' operations, participate in training at the covered mines, and participate in two local mine rescue contests.
- (3) It would strengthen the requirements for knowledge and experience of mine rescue team members by requiring them to have knowledge of the operations and ventilation of the covered mines and by requiring contract team members to have at least 3 years underground coal mine experience within the 10-year period preceding their employment on the contract team.

The proposed rule also would increase overall mine rescue capability of the mine operator by requiring the mine operator to provide two certified mine rescue teams and to have a person knowledgeable in mine emergency response on each shift. The proposal includes criteria for certifying the mine rescue teams and clarifies training requirements for the knowledgeable person.

Team members employed at a given mine are knowledgeable in mine gases, ventilation, first aid, and other health and safety subjects as they apply generally and at that specific mine. Their level of mine rescue training, combined with their everyday presence during the normal work cycle, provides an added measure of safety for each worker at the mine.

IV. COST OF COMPLIANCE

SUMMARY

In this chapter, MSHA estimates the compliance costs associated with the mine rescue team proposed rule. Table IV-1 presents the total yearly compliance costs for the underground coal mine industry by requirement and by mine size. All cost estimates are presented in 2005 dollars.

The cost of the proposed rule for all underground coal mine operators would be approximately \$3.0 million per year. Of this total, mines with 1-19 employees would incur costs of approximately \$0.7 million per year; mines with 20-500 employees would incur costs of approximately \$2.2 million per year; and mines with 501+ employees would incur costs of approximately \$0.1 million per year.

Specific to the mine rescue team proposed rule, MSHA has also broken down total compliance costs for mines with 1-36 employees and mines with 37 or more employees. Of the \$3.0 million total yearly cost of the proposed rule, underground coal mines with 1-36 employees would incur costs of approximately \$1.25 million per year, and underground coal mines with 37 or more employees would incur costs of approximately \$1.75 million per year.

In addition, as shown in Table IV-1a, the proposed rule would indirectly impose costs on State teams (State-sponsored teams) of approximately \$0.1 million yearly.

Table IV-1: Summary of Total Yearly Cost of the Proposed Rule for Underground Coal Mine Operators

Section	Mine Size			Total Yearly Cost
	1-19	20-500	501+	
One Hour from Mine Rescue Station to Mine ^a	\$317,530	\$150,409	\$0	\$467,938
Mine Rescue Team Training ^b	\$184,033	\$1,249,305	\$45,737	\$1,479,075
Mine Rescue Contests ^c	\$62,485	\$503,349	\$29,480	\$595,315
Certification of Mine Rescue Teams ^d	\$7,175	\$13,697	\$424	\$21,296
Responsible Person Training & Certification ^e	\$83,267	\$317,930	\$14,761	\$415,958
Total	\$654,491	\$2,234,690	\$90,402	\$2,979,582

^a Source: Table IV-4.

^b Source: Table IV-5, Table IV-6, Table IV-8, and Table IV-9. (Note that costs for State mine rescue teams in these tables are excluded here.)

^c Source: Table IV-11. (Note that costs for State mine rescue teams in this table are excluded here.)

^d Source: Table IV-12.

Table IV-1a: Summary of Total Yearly Cost of the Proposed Rule for State Mine Rescue Teams

Section	Mine Size			Total Yearly Cost
	1-19	20-500	501+	
Mine Rescue Team Training ^a	\$43,643	\$43,934	\$712	\$88,289
Mine Rescue Contests ^b	\$15,713	\$26,362	\$447	\$42,522
Total	\$59,357	\$70,296	\$1,158	\$130,811

^a Source: Table IV-8 and Table IV-9.

^b Source: Table IV-11.

The total costs reported in Table IV-1 and Table IV-1a, and in all other tables in this chapter, are MSHA's best estimates of the projected costs based on the Agency's knowledge, experience, and available information. In some cases, however, the estimates may appear to deviate slightly from the sum or product of their component factors due to rounding.

METHODOLOGY

For the proposed rule, MSHA estimates the following costs: (1) one-time or intermittent costs; (2) annual costs; and (3) annualized costs. One-time costs are those that are incurred once, usually in the first year of compliance, and do not recur. Intermittent costs are those costs that may recur from time to time, but not annually. Capital expenditures, such as the cost of purchasing compliance equipment, are an example of one-time or intermittent costs. Annual costs are costs that normally occur every year. Two examples of annual costs are maintenance costs and recordkeeping costs. Annualized costs are one-time and intermittent costs that are apportioned over the economic life of the investment using a specified interest (or discount) rate. For this PREA, MSHA used a (real) discount rate of 7 percent, as recommended by the Office of Management and Budget (OMB), using the formula:

$$a = (i * (1 + i)^n) / ((1 + i)^n - 1),$$

where (a) equals the annualization factor, (i) equals the annual discount rate, and (n) equals the economic life of the non-annual recurring investment.¹⁰

MSHA used an hourly compensation rate of \$25.98 for an underground coal miner, \$62.50 for an underground coal mine supervisor, and \$21.78 for a clerical employee.¹¹ The wage rates include benefits such as social security, unemployment insurance, and workers' compensation, but they do not reflect shift differentials or overtime pay. For convenience, miner "compensation" in this PREA is referred to as "wages," where that term is understood to include benefits. MSHA assumes that contractors and mine rescue team members, including State team members, receive a wage rate equal to what underground coal miners earn. Trainers are assumed to receive the same wage rate as an underground coal mine supervisor.

SCOPE

The proposed rule would apply only to underground coal mine operators. Table IV-2 shows the number of the underground coal mines and the number of miners employed at these mines. Miners are classified both by MSHA's standard mine-size categories (1-19 employees, 20-500 employees, 501+ employees) and by the mine-size categories specified in the MINER Act (1-36 and 37+ employees). An additional 8,250 (non-office) contractors work at underground coal mines.

¹⁰ For one-time costs with an infinite, or indefinite, economic life, the annualization factor is equal to the discount rate, here 0.07.

¹¹ Hourly wage rates are derived from Western Mine Engineering Inc., *U.S. Coal Mine Salaries, Wages, & Benefits – 2005 Survey Results*.

Table IV-2: Profile of Underground Coal Mines and Employees*

Mine Size	(1-19) Employees		(20-500) Employees				(500+) Employees		Total	
	Small: (1-36) Employees		Small: (1-36) Employees		Large: (37+) Employees		Large: (37+) Employees			
Employment	# of Mines	# of Miners	# of Mines	# of Miners	# of Mines	# of Miners	# of Mines	# of Miners	# of Mines	# of Miners
		220	2,255	148	4,017	272	28,835	13	7,490	653

* Source: 2006 MSHA data from Teradata run on March 27, 2007.

SECTION-BY-SECTION ANALYSIS

Below, MSHA provides a section-by-section analysis of the estimated costs of the proposed rule. Where possible, the specific data sources that MSHA relied on for its estimates have been identified. Where no data source is specified, MSHA relied on the experience and expertise of its technical staff in the Agency’s Offices of Coal Mine Safety and Health, Educational Policy and Development, and Technical Support.

§ 49.12(f) Availability of Mine Rescue Team.

Proposed paragraph 49.12(f) would require that the mine rescue team be available at the underground coal mine within one hour ground travel time from the mine rescue station. The existing standard requires that teams be within two hours ground travel time from the station to the mine. Due to the changed requirement in proposed § 49.12(f), additional mine rescue stations would be needed.

Each mine rescue station must stock enough equipment for two mine rescue teams, totaling 12 persons. Table IV-3 summarizes the estimated cost to supply a mine rescue station with equipment for two teams in accordance with proposed § 49.16(a). The table includes appropriate annualization factors to account for the service life of each type of equipment. MSHA assumes the proposed requirements in § 49.16(a) for mine rescue stations serving anthracite coal mines would have no economic impact on existing mine rescue stations because the appropriate changes in mine rescue team equipment have already been accomplished through petitions for modification.

Table IV-3: Costs to Stock Equipment for a Mine Rescue Station in Accordance with § 49.16

Equipment For Each Team	Cost	Annual Cost	Annualized Cost	Total Yearly Cost
12 Self-Contained Oxygen Breathing Apparatus ^a	\$96,821		\$6,777	\$6,777
12 Refillable Canisters ^a	\$6,900		\$483	\$483
2 Spare Fiber Cylinders ^b	\$3,225		\$354	\$354
Oxygen Pump or Cascading System ^a	\$14,085		\$986	\$986
12 Cap Lamps with a Charging Rack ^c	\$5,360		\$2,042	\$2,042
2 Gas Detectors ^d	\$3,000		\$732	\$732
1 Portable Mine Rescue Communication System ^a	\$2,000		\$140	\$140
Tools ^e	\$2,728		\$191	\$191
Yearly Maintenance & Replacement Supply	\$1,357	\$1,357		\$1,357
Total	\$135,475	\$1,357	\$11,706	\$13,062

^a This equipment has an indefinite service life if given proper care and maintenance. The associated annualization factor is 7%.

^b This equipment has a 15-year service life. The associated annualization factor is 11.0%.

^c This equipment has a 3- year service life. The associated annualization factor is 38.1%.

^d This equipment has a 5-year service life. The associated annualization factor is 24.4%.

^e These are the tools needed to maintain the other mine rescue equipment. They have an indefinite service life. The associated annualization factor is 7%.

Proposed § 49.16(b) requires that rescue apparatus and equipment be maintained and that a person trained in the use and care of breathing apparatus inspect and test the apparatus at least every 30 days and certify the inspection and test with a signature and date. When the inspection indicates that a corrective action is necessary, the corrective action shall be made and the person shall record the corrective action taken. The certification and the record of corrective action shall be maintained at the mine rescue station for a period of one year and made available on request to an authorized representative of the Secretary. MSHA estimates that it would take an average of 20 minutes (or 0.33 hours) to inspect, test, certify, and file the certification for each apparatus. MSHA further estimates that, on average, each apparatus requires corrective action six times a year and that it would take approximately 15 minutes (0.25 hours) to record and file each corrective action. MSHA estimates that the time required for a team member to take each corrective action is approximately 0.5 hours. MSHA assumes that all of the requirements of § 49.16(b) would be performed by a mine rescue team member,

earning a miner's hourly wage rate of \$25.98, because no clerical employees work at mine rescue stations.

Based on MSHA's knowledge and experience, most mine operators and States already have the facilities to accommodate the additional mine rescue stations. However, MSHA anticipates that they would have to lease facilities for 25 percent of the additional mine rescue stations. MSHA estimates the cost to lease a mine rescue facility would be approximately \$4,000 annually.

Based on 2007 MSHA data, there are 92 coal mine rescue stations throughout the United States. Most of the large mines already are located no more than one hour ground travel time from their mine rescue stations. Furthermore, some States are already in compliance with this section. For example, all but one of the mines in Alabama served by a rescue team is located within one hour ground travel time from the station to the mine. MSHA solicits comments on whether some existing mine rescue stations may need to be moved to meet the one hour ground travel time requirement.

MSHA estimates that approximately 30 percent more mine rescue stations (28 additional mine rescue stations) would be needed in response to the proposed rule. Of these, MSHA estimates that mines with 1-19 total employment would need 19 more mine rescue stations; mines with 20-36 employment would need five more mine rescue stations; mines with 37-500 total employment would need four more mine rescue stations; and mines with 500+ total employment would not need any additional mine rescue stations. MSHA assumes that none of the additional mine rescue stations in response to the proposed rule would be State-sponsored or would be needed to serve anthracite mines.

MSHA's estimate of the yearly cost associated with the additional mine rescue stations is presented in Table IV-4. MSHA solicits comments on these estimates and on the assumptions and data that MSHA used.

Table IV-4: Yearly Cost to Have Additional Mine Rescue Stations

Mine Size	(1-19) Employees	(20-500) Employees		(500+) Employees	Total
	Small: (1-36) Employees	Small: (1-36) Employees	Large: (37+) Employees	Large: (37+) Employees	
# of Additional Mine Rescue Stations	19	5	4	0	28
Yearly Cost per Station for Equipment ^a	\$13,062	\$13,062	\$13,062	\$13,062	
# of Additional Leased Facilities for Mine Rescue Stations ^b	4.75	1.25	1.00	0	7.00
Annual Cost per Leased Facility	\$4,000	\$4,000	\$4,000	\$4,000	
Annual Cost per Mine Rescue Station for Apparatus Inspection, Testing, Corrective Actions ^c	\$2,650	\$2,650	\$2,650	\$2,650	
Total Yearly Cost ^d	\$317,530	\$83,560	\$66,848	\$0	\$467,938

^a Source: Table IV-3.

^b # of additional leased facilities for mine rescue stations = (25% x # of additional new mine rescue stations).

^c Annual cost per mine rescue station for apparatus inspection, testing, and corrective actions = $(12 \times I \times T_i \times W_m) + (12 \times D \times T_c \times W_m) + (12 \times D \times T_a \times W_m)$, where 12 is the # of apparatus per mine rescue station; I is the # of inspections per year ($I=12$); T_i is the # of hours needed to inspect, test, certify, and file the certification for each apparatus ($T_i= 0.33$ hours); W_m is the hourly wage rate for an underground coal miner ($W_m=\$25.98$); D is the average # of times that each apparatus requires corrective action a year ($D=6$ times); T_a is the time required for a team member to take each corrective action ($T_a=0.5$ hours); and T_c is the # of hours that it would take to record each corrective action and file it ($T_c=0.25$ hours).

^d Total yearly costs = (# of additional mine rescue stations x yearly cost per station for equipment) + (# of additional leased facilities for mine rescue stations x annual cost to lease per leased facility) + (# of additional mine rescue stations x annual cost per mine rescue station for apparatus inspection, testing, and corrective actions).

Improved Mine Rescue Availability and Training.

Due to the new requirements in the proposed rule related to improved availability and training for mine rescue teams, MSHA expects that a total of 56 additional mine rescue teams would be needed. MSHA estimates that all of these would be composite teams, all serving large mines as defined under the MINER Act (those with 37+ employees). For convenience, MSHA assumed that, in response to the proposed rule, no existing mine rescue team would change the type of team it was (e.g., all existing contract teams would remain contract teams). The change in mine rescue team composition, therefore, would have to take place in new teams. MSHA requests comments on the estimated number of new teams and their composition. MSHA specifically solicits comments on the number of new teams required to satisfy the proposed rule. MSHA is particularly interested in the make-up of new teams and the feasibility of forming new teams.

Each team has six members, i.e., five members and one alternate. However, mine operators would only need an additional five members, on average, to form another mine-site or composite team, because the majority of these types of existing teams have extra members available. New State teams and contract teams would need an additional six members because existing teams of this type do not typically have extra members. From MSHA's experience, mine rescue team members would serve on a team for an average of approximately 10 years.

Physical Requirements and Initial Training

Under proposed § 49.18(a), before a miner can become a mine rescue team member, the miner must complete 20 hours of training in the use, care, and maintenance of the type of breathing apparatus used by the team. In addition, under proposed § 49.17(a), each team member has to have a physical examination annually, which MSHA estimates would cost \$150. This cost would include the physician's certification that the mine rescue team member is physically fit to perform mine rescue and recovery work for prolonged periods under strenuous conditions. It would take approximately one hour for each team member to have a physical.¹² Some State agencies provide the 20 hours of initial training free of charge. MSHA estimates that approximately 30 percent of the new mine rescue teams would be trained by State agencies. Typically, one trainer trains two teams concurrently. The trainer would need approximately two hours to prepare materials for each 20-hour training session. The hourly wage rate for an underground coal miner is \$25.98, and the hourly wage rate for a trainer, equivalent to a mine supervisor's, is approximately \$62.50. MSHA estimates that the oxygen supply and other miscellaneous materials for training would cost approximately \$500 per team. Finally, MSHA assumes that none of the new mine rescue teams would impose costs on mine operators beyond those itemized in this PREA.

Table IV-5 presents the costs, by type of team, for the industry to comply with the physical and initial training requirements for new mine rescue teams. MSHA solicits comments on these cost estimates and on the assumptions and data that MSHA used.

¹² MSHA expects that the cost to the mine operator of mailing the MSHA Form 5000-3 to the physician and keeping the signed copy on file would be negligible and subsumed in the cost of the physical.

Table IV-5: Yearly Cost for Additional Mine Rescue Teams to Meet Requirements in § 49.17(a) and § 49.18(a)

Projected # of Additional Mine Rescue Teams ^a															
Mine Size	(1-19) Employees			(20-500) Employees						(500+) Employees			Total		
	Small: (1-36) Employees			Small: (1-36) Employees			Large: (37+) Employees			Large: (37+) Employees					
Team Type	Mine Site	Compo- site	Contract or State	Mine Site	Compo- site	Contract or State	Mine Site	Compo- site	Contract or State	Mine Site	Compo- site	Contract or State	Mine Site	Composite	Contract or State
		-	-	-	-	-	-	-	56	-	-	0	-	-	56
Cost Estimate for Underground Coal Mines to Have Additional Mine Resue Teams ^b															
Mine Size	(1-19) Employees			(20-500) Employees						(500+) Employees			Total		
	Small: (1-36) Employees			Small: (1-36) Employees			Large: (37+) Employees			Large: (37+) Employees					
Costs	Mine Site	Compo- site	Contract or State	Mine Site	Compo- site	Contract or State	Mine Site	Compo- site	Contract or State	Mine Site	Compo- site	Contract or State	Mine Site	Composite	Contract or State
	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 76,544	\$ -	\$ -	\$ 0	\$ -	\$ -	\$ 76,544

^a Source: Table IV-9.

^b Costs estimate for underground coal mines to have additional mine rescue teams = $\{[(K \times M \times 20 \times W_m) + (K \times P / N \times 22 \times W_t) + (K \times P / N \times S)] \times a\} + [(K \times M \times 1 \times W_m) + (K \times M \times D)]$, where K is the # of additional mine rescue teams; M is the number of team members (for mine site and composite teams = 5); 1 is the # of hours it would take a team member to have a physical (T=1 hour); 20 is the number of hours of training in the use, care, and maintenance of the type of breathing apparatus used by the team; W_m is the hourly wage rate for an underground coal miner (W_m =\$25.98); N is the # teams that a trainer can train at a time (N=2); 22 is the total # of hours for a trainer to prepare the training materials and conduct training; W_t is the hourly wage rate for a trainer (W_t =\$62.50); P is the percentage of team members that mine operators would have to train (P=0.70); S is the cost of oxygen supplies and other miscellaneous materials to train a team (S=\$500); a is the annualization factor for 10 years (a=0.1423); and D is the cost for a physical (D=\$150).

In addition, the trainer would need to make, file, and maintain a record of training for each new mine rescue team member in accordance with existing requirements. MSHA estimates that the trainer would take approximately 12 minutes (0.2 hours) per team member to make a record of the training and file it at the mine rescue station. The record of training for each team member must be kept on file at the mine rescue station for a period of 1 year. Table IV-6 shows the costs to make, file, and maintain the training record for each team member. MSHA solicits comments on these cost estimates and on the assumptions and data that MSHA used.

Table IV-6: Annual Cost to Make, File, and Maintain the Record of Training for Each New Team Member

Type of Team	# of New Team Members ^a			Annual Cost to Record the Training for Each New Team Member ^b			Total Annual Cost
	(1-19) Employees	(20-500) Employees	(501+) Employees	(1-19) Employees	(20-500) Employees	(501+) Employees	
Mine Site	-	-	-	\$0	\$0	\$0	\$0
Composite	-	280	-	\$0	\$3,500	\$0	\$3,500
Contract or State	-	-	-	\$0	\$0	\$0	\$0
Total	-	280	-	\$0	\$3,500	\$0	\$3,500

^a # of new team members = (# of new teams x N), where the # of new teams is presented in Table IV-5; and N is the number of additional team members on a new mine rescue team (N=5 for mine site and composite teams).

^b Annual cost to record the training for each new team member = [(# of new team members x T_s x W_s)], where T_s is the # of hours that it would take for a trainer to make, file, and maintain a record of training the training for each new team member (T_s=0.20 hours); and W_s is the hourly wage rate for a trainer (W_s=\$62.50).

§ 49.18(b) Annual Refresher Training for Existing Mine Rescue Teams.

The MINER Act has requirements for mine rescue team training at each of the underground coal mines that the team covers. Proposed § 49.18(b) would require mine rescue team members, including existing mine rescue teams, to have at least 64 hours of refresher training annually. This is an increase of 24 hours to accommodate the additional requirements in the MINER Act. The MINER Act also requires team members to be knowledgeable about the operations and ventilation at each covered mine. Consistent with Table 1 in the preamble for the proposed rule, the training requirements for various team types and sizes are summarized in Table IV-7.

Table IV-7: Frequency of Training for Mine Rescue Team Members at Each Covered Underground Coal Mine

Type of Team	Mine Size	
	Small: (1-36) Employees	Large: (37+) Employees
Mine Site	2 (semi-annually)	1 (annually)
Composite	2 (semi-annually)	2 (semi-annually)
Contract	2 (semi-annually)	4 (quarterly)
State	2 (semi-annually)	1 (annually)

MSHA estimates that the underground training at each covered mine would take approximately one hour at a mine with 1-19 employees; two hours at a mine with 20-500 employees; and four hours at a mine with 501+ employees. This training would count toward the 64 hours of annual refresher training, in proposed § 49.18(b). In addition, MSHA estimates that it would take approximately one hour for team members who are not working at the covered mine to travel to the covered mine and back to their work location or home.¹³

Section 49.18(b)(6) would require teams to train at least once a year in smoke, simulated smoke, or an equivalent environment while wearing mine rescue apparatus. MSHA estimates the cost of the smoke for this training to be \$50.

MSHA anticipates that none of the existing mine rescue teams will discontinue service as a result of the proposed rule. However, the number of mines served by existing mine rescue teams may change. In particular, MSHA estimates that the average number of mines served by contract and State mine rescue teams will decline from approximately 22 mines to approximately 18 mines in response to the proposed rule.¹⁴ The frequency of training at a covered mine is dependent on the type of team and the size of the mine the team covers, as shown in Table IV-7. Based on MSHA’s knowledge and experience, existing mine rescue teams already train twice at one of their covered mines under the existing standard.

MSHA assumes that annual refresher training at the covered mines will be integrated with existing training requirements so that mine rescue teams will be able to conduct all their required underground training as part of the 64-hour annual refresher

¹³ No travel time is necessary for mine site teams because they are already at the covered mine. For composite teams (on average, two members work at the covered mine), four out of six team members need an hour to travel to and from the covered mine and the other two are already there. For contract teams and State teams, all six team members need to travel to and from all covered mines.

¹⁴ All teams combined must cover 653 mines. Under the existing rule, 56 mine site teams and 36 composite teams cover 82 mines. The remainder of mines is covered by 53 contract and State teams. These 53 teams must cover 571 mines under the existing rule. Under the proposed rule, MSHA estimates that 56 new composite teams will cover 84 mines. Therefore, the 53 contract and State teams must cover 487 mines under the proposed rule. Keeping in mind that each mine must be covered by two teams, each of these 53 contract and State teams must cover, on average, $(571/53) \times 2 = 21.55$ mines under the existing rule and $(487/53) \times 2 = 18.38$ mines under the proposed rule.

training under proposed § 49.18(b). Table IV-8 presents the cost for existing mine-site, composite, and contract mine rescue teams to receive the additional 24 hours of training required under proposed § 49.18(b).

Proposed § 49.11 would allow team members of State-sponsored teams who are full-time State employees whose primary job duties include (1) inspecting underground mines for compliance with State safety laws or (2) training mine rescue teams or (3) conducting mine safety training or (4) other similar duties that would enhance their mine rescue knowledge to substitute their regular job experience for 50 percent of the training requirements for non-State employee mine rescue team members. MSHA does not know how many State team members are full-time State employees with the aforementioned primary job duties. For cost purposes, MSHA assumes that half (50 percent) of State mine rescue teams members would qualify for a 50 percent reduction in the 64 hours of annual refresher training requirements in § 49.18(b). The effect of this assumption is to create, on average, a 48-hour annual refresher training requirement, which is 8 hours more than existing requirements.¹⁵ Table IV-8 presents the cost for existing State mine rescue teams to receive the addition 8 hours of training, on average, resulting from §§ 49.11 and 49.18(b). MSHA solicits comments on these cost estimates and on the assumptions and data that MSHA used.

¹⁵ Under this assumption, half of the State mine rescue team members are not full-time State employees and would therefore require 64 hours of annual refresher training under the proposed rule. The other half of the State mine rescue team members are full-time State employees who could substitute their regular job experience for 50 percent of the annual refresher training requirements. This would reduce the annual refresher training requirement for these qualifying State mine rescue team member to 32 hours under the proposed rule.

Table IV-8: Yearly Cost for Annual Refresher Training for Existing Mine Rescue Teams

Type of Team	Profile of Existing Mine Rescue Teams ^a								Total	
	(1-19) Employees		(20-500) Employees				(500+) Employees			
	Small: (1-36) Employees		Small: (1-36) Employees		Large: (37+) Employees		Large: (37+) Employees			
Mine Site	3.0		5.0		40.0		8.0		56.0	
Composite	5.0		7.0		22.0		2.0		36.0	
Contract	14.0		9.0		14.6		0.4		38.0	
State	5.5		3.5		5.8		0.2		15.0	
Total	27.6		24.5		82.3		10.6		145.0	

Type of Team	# of Mines to Which the Existing Mine Rescue Teams Would Continue to Provide Mine Rescue Service ^b								Total	
	(1-19) Employees		(20-500) Employees				(500+) Employees			
	Small: (1-36) Employees		Small: (1-36) Employees		Large: (37+) Employees		Large: (37+) Employees			
	# of Mines	# of Teams	# of Mines	# of Teams	# of Mines	# of Teams	# of Mines	# of Teams	# of Mines	# of Teams
Mine Site	1.5	3.0	2.5	5.0	20.0	40.0	4.0	8.0	28.0	56.0
Composite	7.5	5.0	10.5	7.0	33.0	22.0	3.0	2.0	54.0	36.0
Contract	151.3	16.5	96.8	10.5	96.8	10.5	4.3	0.5	349.2	38.0
State	59.7	6.5	38.2	4.2	38.2	4.2	1.7	0.2	137.8	15.0
Total	220.0	31.0	148.0	26.7	188.0	76.7	13.0	10.7	569.0	145.0

Type of Team	Additional Cost for Existing Mine Rescue Teams to Continue to Provide Mine Rescue Service ^c				Total			
	(1-19) Employees		(20-500) Employees					
	Small: (1-36) Employees		Large: (37+) Employees					
Mine Site	\$11,373		\$18,956		\$151,645		\$30,329	\$212,303
Composite	\$21,034		\$29,448		\$92,550		\$8,414	\$151,445
Contract	\$151,626		\$97,012		\$157,373		\$6,994	\$413,005
State ^d	\$43,643		\$27,923		\$16,010		\$712	\$88,289
Total	\$227,677		\$173,339		\$417,577		\$46,448	\$865,041

^a Source: 2006 data

^b Distribution of existing teams across mine size is an estimate. The distribution under the proposed rule would be different from the existing distribution because contract teams and State teams would serve fewer mines on average and because larger mines would rely more on mine site teams and composite teams. Each mine site team serves one mine and each composite team is assumed to serve three mines. Contract teams and State teams would each serve, on average, 18.38 mines. Each mine must be covered by two teams.

^c Additional cost for the existing mine rescue teams to continue to provide mine rescue service = $\{[(M \times f) - 2] \times N \times T \times R \times W_m\} + ((R \times A \times 6 \times W_m) + (\$50 \times R))$, where M is the average # of mines that the team would cover (M=1 for mine-site teams; M=3 for composite teams; and M=18.38 for contract teams and for State teams); 2 is the # of times that the team trains under the existing regulation; f is the frequency of training (see Table IV-7); N is the number of members on a mine rescue team that would have to travel to train (N=0 for mine site; N=4 for composite teams; N=6 for contract teams and for State teams); T is the # of hours for the existing members to travel round trip to the covered mines (T=1 hour); R is the # of existing teams; A is the # of additional annual refresher training hours for existing team members (A=24 hours for mine-site, composite, and contract teams; and A=8 hours for State teams); 6 is the # of members on each team; W_m is the hourly wage rate for an underground coal miner (W_m=\$25.98); and \$50 is the cost for smoke to train a mine rescue team.

^d This cost would be an indirect cost to State governments, not a cost to the coal industry.

§ 49.18(b) Annual Refresher Training for New Mine Rescue Teams.

Proposed § 49.18(b) would require mine rescue team members to have at least 64 hours of refresher training annually. This is an increase from 40 to 64 hours to accommodate the additional requirements in the MINER Act, which include familiarizing team members with the operation of covered mines and also include training that enhances knowledge of the operation and ventilation of covered mines. New mine rescue team members would also need to fulfill these requirements. A team is made up of five members and one alternate, totaling six persons. However, MSHA estimates that, on average, only an additional five persons are needed to make up a new mine-site or composite team because the majority of these types of existing teams have extra persons that can be assigned to new teams. New contract and State teams would need six members because existing teams of this type do not typically have extra persons available for other teams. Typically, one trainer trains two teams concurrently and completes the required record of training. In addition, the trainer would need approximately 4 hours to prepare training materials for each training session. The hourly wage rate for an underground coal miner is \$25.98. MSHA estimates it would take team members approximately 1 hour to travel round trip to each covered mine for mine site training, unless they are employed at that covered mine.

The cost for new composite mine rescue team members to receive 64 hours of annual refresher training is presented in Table IV-9.

Table IV-9: Yearly Cost for Annual Refresher Training for New Mine Rescue Teams

Type of Team	# of New Mine Rescue Teams ^a								Total	
	(1-19) Employees		(20-500) Employees				(500+) Employees			
	Small: (1-36) Employees		Small: (1-36) Employees		Large: (37+) Employees		Large: (37+) Employees			
	# of Mines	# of Teams	# of Mines	# of Teams	# of Mines	# of Teams	# of Mines	# of Teams	# of Mines	# of Teams
Mine Site	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Composite	0.0	0.0	0.0	0.0	84.0	56.0	0.0	0.0	84.0	56.0
Contract	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	0.0	0.0	0.0	0.0	84.0	56.0	0.0	0.0	84.0	56.0

Type of Team	Cost for New Mine Rescue Teams ^b				Total	
	(1-19) Employees		(20-500) Employees			
	Small: (1-36) Employees		Small: (1-36) Employees		Large: (37+) Employees	
Mine Site	\$0	\$0	\$0	\$0	\$0	\$0
Composite	\$0	\$0	\$622,279	\$0	\$622,279	\$622,279
Contract	\$0	\$0	\$0	\$0	\$0	\$0
State	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$622,279	\$0	\$622,279	\$622,279

^a The number and distribution of new teams across mine sizes is an estimate. New mine teams are required because contract teams and State teams would serve fewer mines on average and because larger mines would rely more on mine site teams and composite teams. Each mine site team serves one mine and each composite team is assumed to serve three mines. Contract teams and state teams would each serve, on average, 18.38 mines. Each mine must be covered by two teams.

^b Cost for new mine rescue teams to serve the remaining underground coal mines = $[(R \times N \times A \times W_m) + (R \times M \times T \times F \times C \times W_m) + (R / 2 \times 44 \times W_t) + (\$50 \times R)]$, where R is the # of new mine rescue teams that are going to cover the remaining underground coal mines; N is the number of additional team members on a new mine rescue team (N=5 for mine site and composite; N=6 for contract and State teams); A is the number of hours that new team members have to be trained annually (A=64 hours for mine-site, composite, and contract teams; and A=48 hours for State teams); W_m is the hourly wage rate for an underground coal miner ($W_m=\$25.98$); M is the # of new team members that would have to travel to train (M=0 for mine site; M=4 for composite; and M=6 for contract and State teams); F is the frequency of training (see Table IV-7); C is the average # of mines that the team covers (M=1 for mine site; M=3 for composite; M=18.38 for contract and State teams); T is the # of hours for team members to travel round trip to the covered mines (T=0 hour for mine site; and T=1 hour for composite teams, contract, and State teams); 2 is the # of teams that a trainer could train at a time; 68 is the total # of hours that it would take for a trainer to train 2 mine rescue teams and prepare the materials; W_t is the hourly wage rate for a trainer ($W_t=\$62.50$); and \$50 is the cost for smoke to train a mine rescue team.

§ 49.20(a)(2) Participation in Two Local Mine Rescue Contests.

Proposed § 49.20(a)(2), in accordance with the MINER Act, would require each mine rescue team to participate in at least two local mine rescue contests annually. Mine rescue contests are designed to sharpen skills and test the knowledge of team member who would be called on to respond to a mine emergency.

There is no existing requirement that teams participate in mine rescue contests. However, a number of teams currently participate in local contests, as well as in the national contest. Based on the Agency’s knowledge and experience, MSHA estimates that approximately 30 percent of the existing mine rescue teams participate in two contests annually. MSHA assumes that those mine rescue teams that currently participate in two mine rescue contests would not incur additional costs from proposed § 49.20(a)(2).

To participate, according to contest rules, mine rescue teams are required, to have a seven-person team—five members, one briefing officer, and one patient.¹⁶ MSHA estimates that the costs to participate in a local contest are as follows: \$350 for entry fee, \$120 for supplies, and \$100 for miscellaneous expenses, for a total cost of \$570. MSHA estimates that, on average, it would take a team approximately six hours to compete in a local contest and two hours to travel to and from the contest.

Table IV-10 presents the number of additional existing and new mine rescue teams, by type, that would need to compete in local mine rescue contests as result of the proposed rule, and Table IV-11 presents the cost for these mine rescue teams to participate in two local contests. MSHA solicits comments on these cost estimates and on the assumptions and data that MSHA used.

Table IV-10: The Number of Additional Mine Rescue Teams that Would Participate in Local Contests

Type of Team	# of Existing Teams that Do Not Currently Compete in Contests ^a				# of New Teams ^b			
	(1-19) Employees	(20-500) Employees	(501+) Employees	Total	(1-19) Employees	(20-500) Employees	(501+) Employees	Total
Mine Site	2.1	31.5	5.6	39.2	0	0	0	0.0
Composite	3.5	20.3	1.4	25.2	0	56	0	56.0
Contract	9.8	16.5	0.3	26.6	0	0	0	0.0
State	3.9	6.5	0.1	10.5	0	0	0	0.0
Total	19.3	74.8	7.4	101.5	0	56	0	56.0

^a # of existing teams that do not compete in contests = 70% of existing teams (from Table IV-8).

^b # of new teams (from Table IV-9).

¹⁶ *Mine Rescue Rules*. <http://www.msha.gov/MineRescue/CONTEST/2007Coal/Rules/2007Rules.asp>, March 29, 2007. The patient does not have to be a trained mine rescue team member.

Table IV-11: Annual Cost for Mine Rescue Teams to Compete in Two Local Mine Rescue Contests under § 49.20(a)(2)

Type of Team	Total # of Existing & New Teams Competing in Local Mine Contests as Result of Proposed Rule ^a			Annual Cost ^b			Total Annual Cost
	(1-19) Employees	(20-500) Employees	(501+) Employees	(1-19) Employees	(20-500) Employees	(501+) Employees	
Mine Site	2.1	31.5	5.6	\$8,504	\$127,567	\$22,679	\$158,751
Composite	3.5	76.3	1.4	\$14,174	\$308,997	\$5,670	\$328,841
Contract	9.8	16.5	0.3	\$39,807	\$66,785	\$1,132	\$107,724
State ^c	3.9	6.5	0.1	\$15,713	\$26,362	\$447	\$42,522
Total	19.3	130.8	7.4	\$78,199	\$529,711	\$29,927	\$637,837

^a Source: Table IV-10.

^b Annual cost = [(total # of teams that need to compete in local contests x \$570 x 2) + (total # of teams that need to compete in local contests x 2 x 8 x 7 x W_m)], where \$570 is the cost to compete in a local contest; 2 is the # of contests per year; 7 is the required number of team members to compete in a contest; 8 is the number of hours per competition; and W_m is the hourly wage rate for an underground coal miner (W_m= \$25.98).

^c This cost would be an indirect cost to State governments, not a cost to the coal industry.

§ 49.50 Certification of Mine Rescue Teams.

The proposed rule would require all underground coal mine operators to certify that each of the mine's designated rescue teams meet the requirements of § 49.50. To meet the proposed requirement, the mine operator must send the District Manager an annual statement certifying that each team meets the requirements in Table 49.50: Criteria to Certify the Qualifications of Mine Rescue Team. MSHA estimates that it would take a mine supervisor approximately 30 minutes to certify two mine rescue teams, and approximately one minute for a clerical employee to send in the certification. MSHA estimates that it would cost \$1 for postage and handling. Table IV-12 shows the costs to certify mine rescue teams in accordance with § 49.50.

Table IV-12: Annual Cost for Mine Operators to Certify Two Mine Rescue Teams in Accordance with § 49.50

Mine Size	# of Underground Mines ^a	Cost for a Mine Operator to Certify Two Teams ^b	Total Annual Cost
(1-19) Employees	220	\$33	\$7,175
(20-500) Employees	420	\$33	\$13,697
(501+) Employees	13	\$33	\$424
Total	653		\$21,296

^a Source: Table IV-2.

^b Cost for a mine operator to certify two teams = $[(T_s \times W_s) + (T_c \times W_c)] + \1 , where T_s is the number of hours it would take for a mine supervisor to certify two teams ($T_s=0.5$ hours); W_s is the hourly wage rate for a mine supervisor ($W_s=\$62.50$); T_c is the # of hours it would take a clerical employee to mail the certification ($T_c=0.0167$ hours); W_c is the hourly wage rate for a clerical worker ($W_c=\$21.78$); and \$1 is the cost to send in the certification.

§ 49.60 (a)(5) Contest Judges.

MSHA estimates that this proposed provision would not impose any additional cost on underground coal mine operators because, based on Agency experience, no industry representatives have been serving as judges at mine rescue contests. MSHA requests comments on whether this provision would impose any costs on industry.

§ 75.1501 Emergency Evacuations.

The MINER Act requires the operator to have a person employed on each shift who is knowledgeable in mine emergency response. Proposed § 75.1501 would amend existing § 75.1501(a) to require that the responsible person also have current knowledge about the mine’s Emergency Response Plan (ERP), the Mine Rescue Notification Plan, and the Mine Emergency Evacuation and Firefighting Program of Instruction. It would also require that the responsible person be trained annually in mine emergency response coordination and communication.

MSHA believes that there would be a backup responsible person for each mine shift because there would be times when the responsible person could not be at the mine site. MSHA estimates that it would take approximately two hours for a trainer to train the responsible person. Generally, the responsible person and the backup would be mine supervisors. The operator must certify by signature and date after each responsible person has completed the training and keep the certification at the mine for one year. It would take a mine supervisor approximately 90 seconds (0.025 hours) to certify the training, and it would take a clerical employee 30 seconds (0.00833 hours) to file each certification. On average, mines with 1-19 employees operate one shift; mines with 20-500 employees operate two shifts; and mines with 501+ employees operate

three shifts. Table IV-13 presents the cost associated with the training and certification of a responsible person and a backup on each shift in accordance with this proposed section.

Table IV-13: Annual Cost for Mine Operators to Train a Responsible Person Under § 75.1501

Mine Size	# of Underground Coal Mines ^a	Average # of Shifts	Cost to Train a Responsible Person and a Backup ^b	Cost to Certify a Responsible Person and a Backup ^c	Total Annual Cost ^d
(1-19) Employees	220	1	\$375	\$3	\$83,267
(20-500) Employees	420	2	\$375	\$3	\$317,930
(501+) Employees	13	3	\$375	\$3	\$14,761
Total	653				\$415,958

^a Source: Table IV-2.

^b Cost to train a responsible person and a backup = $(T \times N \times W_s)$, where T is the # of hours it would take for training (T=2 hours); N is the # of people involved in training (N=3); and W_s is the hourly wage rate for a mine supervisor (W_s =\$62.50).

^c Cost to certify that a responsible person and a backup received the training = $(T_s \times 2 \times W_s) + (T_c \times 2 \times W_c)$, where T_s is the # of hours it would take for another supervisor to certify that the responsible person and backup received the training (T_s =0.025 hours); 2 is the # of people receiving training (N=2); W_s is the hourly wage rate for a mine supervisor (W_s =\$62.50); W_c is the hourly wage rate for a clerical employee (W_c =\$21.78); and T_c is the # of hours it would take for a clerical employee to file each certification (T_c =0.0823 hours).

^d Total cost = [(cost to train a responsible person and a backup + cost to certify the training of a responsible person and a backup) x # of underground coal mines x # of shifts.

FEASIBILITY

The proposed rule is in response to a statutory requirement in Section 4 of the MINER Act. MSHA has concluded that the requirements of the proposed rule are technologically and economically feasible.

Technological Feasibility

This proposed rule is not a technology-forcing standard and does not involve new scientific knowledge. The requirements of the rule involve training and purchase of equipment and a requirement that no mine served by a mine rescue team be located more than one hour ground travel time from the station to the mine. MSHA has concluded that the proposed rule is technologically feasible.

Economic Feasibility

The total cost of the proposed rule is approximately \$3.0 million annually for all underground coal mine operators. These compliance costs are well under 1 percent of the yearly revenues of \$13.1 billion for these underground coal mine operators. MSHA concludes that the amount of these costs supports its finding that the proposed rule is economically feasible. MSHA solicits comments on this issue.

V. REGULATORY FLEXIBILITY CERTIFICATION

INTRODUCTION

Pursuant to the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), MSHA has analyzed the impact of the proposed rule on small entities. Based on that analysis, MSHA certifies that the proposed rule would not have a significant economic impact on a substantial number of small entities that are covered by this rulemaking. The factual basis for this certification is presented below.

DEFINITION OF A SMALL MINE

Under the RFA, in analyzing the impact of a proposed rule on small entities, MSHA must use the Small Business Administration's (SBA's) definition for a small entity, or after consultation with the SBA Office of Advocacy, establish an alternative definition for the mining industry by publishing that definition in the Federal Register for notice and comment. MSHA has not established an alternative definition, and hence is required to use the SBA's definition. The SBA defines a small entity in the mining industry as an establishment with 500 or fewer employees.

MSHA has also examined the impact of this proposed rule on underground coal mines with fewer than 20 employees, which MSHA has traditionally referred to as "small mines." These small mines differ from larger mines not only in the number of employees, but also in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Therefore, the cost of complying with MSHA's proposed rule and the impact of the proposed rule on small mines will also be different. It is for this reason that small mines are of special concern to MSHA.

In addition, MSHA has examined the cost of compliance for underground coal mines with 36 or fewer employees, consistent with the requirements of the MINER Act, to ensure that the proposed rule would not significantly and adversely impact this subset of mines. Thus, the detailed factual basis below also shows the economic impact on underground coal mines with 36 or fewer employees.

FACTUAL BASIS FOR CERTIFICATION

General Approach

MSHA initially evaluates the economic impact on "small entities" by comparing the estimated costs of a rule for small entities to the estimated revenues. When estimated costs are less than 1 percent of estimated revenues for the size categories considered, MSHA believes it is generally appropriate to conclude that there is no significant economic impact on a substantial number of small entities. If the estimated costs are equal to or exceed 1 percent of revenues, MSHA will investigate whether a further analysis is required. For this proposed rule, MSHA has determined that the estimated costs are less than one percent of the estimated revenues. Therefore, MSHA certifies that this proposed rule does not have a significant economic impact on small entities.

Derivation of Costs and Revenues

The compliance costs noted in this chapter were previously presented in Chapter IV of this document along with an explanation of how they were derived.

Coal mining revenues are based on the total amount of coal production in tons and the price of coal per ton. Total underground coal production in 2006 was 359 million tons. In 2005, the price of underground coal was \$36.42 per ton.¹⁷ Thus, the total estimated revenue in 2006 for underground coal production using the 2005 price was \$13.1 billion. Using the same approach, MSHA estimated 2006 underground coal revenue by employment size category to be approximately \$0.3 billion for 220 mines with 1-19 total employees; \$1.3 billion for 399 mines with 1-36 underground miners; and \$10.1 billion for 640 mines with 1-500 total employees.

Results of Screening Analysis

Table V-1 below shows that when dividing the yearly compliance costs by the annual revenues in each mine size category, the cost of the rule for underground coal mines is 0.23 percent of revenues for mines with 1-19 total employees, 0.09 percent of revenues for mines with 1-36 total underground miners, and 0.03 percent of revenues for mines with 1-500 total employees. Table V-1 also shows the cost as a percentage of revenues to be 0.02 percent for all underground coal mines.

Table V-1 further shows that the proposed rule would result in an average yearly cost per underground coal mine of: \$2,975 for mines with 1-19 employees; \$3,106 for mines with 1-36 employees; and \$4,514 for mines with 1-500 employees. The average yearly cost per mine is \$4,563 for all underground coal mines.

Table V-1: Cost of Proposed Rule Compared to Mine Revenues, by Mine Size

Underground Coal Mines					
Employment Size	# of Mines	Cost of Proposed Rule	Estimated Revenue (Millions)	Cost Per Mine	Cost of Rule as % of Revenue
(1-19) Employees	220	\$654,491	\$285	\$2,975	0.23%
(1-36) Employees	399	\$1,239,325	\$1,349	\$3,106	0.09%
(1-500) Employees	640	\$2,889,180	\$10,106	\$4,514	0.03%
All mines	653	\$2,979,582	\$13,059	\$4,563	0.02%

As shown in Table V-1, when applying MSHA's, SBA's, and the MINER Act's definition of small entities, the cost of the proposed rule to small mines is substantially less than one percent of estimated revenues. Accordingly, MSHA has certified that the proposed rule would not have a significant economic impact on a substantial number of small entities.

¹⁷ The average price for underground coal of \$36.42 per ton comes from the U.S. DOE, EIA, "Annual Coal Report 2005," Table 28, October 2006.

VI. OTHER REGULATORY CONSIDERATIONS

THE UNFUNDED MANDATES REFORM ACT OF 1995

MSHA has reviewed the proposed rule under the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1501 et seq.). The proposed rule would not increase private sector expenditures by more than \$100 million annually; nor would it significantly or uniquely affect small governments. The proposed rule may result in increased expenditures by State, local, or tribal governments, however, because it places new requirements on underground coal mine operators in providing and training mine rescue teams. These proposed changes would not directly affect States or their relationships with the national government; however, some States sponsor mine rescue teams. In the spirit of the Unfunded Mandates Reform Act, MSHA specifically solicits comments on this proposed rule from State officials.

THE TREASURY AND GENERAL GOVERNMENT APPROPRIATIONS ACT OF 1999: ASSESSMENT OF FEDERAL REGULATIONS AND POLICIES ON FAMILIES

Section 654 of the Treasury and General Government Appropriations Act of 1999 (5 U.S.C. 601 note) requires agencies to assess the impact of proposed agency actions on family well-being. MSHA has determined that this proposed rule would have no effect on family stability or safety, marital commitment, parental rights and authority, or income or poverty of families and children. Accordingly, MSHA certifies that this proposed rule would not impact family well-being.

EXECUTIVE ORDER 12630: GOVERNMENT ACTIONS AND INTERFERENCE WITH CONSTITUTIONALLY PROTECTED PROPERTY RIGHTS

This proposed rule would not implement a policy with takings implications. Accordingly, E.O. 12630 requires no further Agency action or analysis.

EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM

This proposed rule was written to provide a clear legal standard for affected conduct and was carefully reviewed to eliminate drafting errors and ambiguities, so as to minimize litigation and undue burden on the Federal court system. Accordingly, this proposed rule would meet the applicable standards provided in Section 3 of E.O. 12988.

EXECUTIVE ORDER 13045: PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS

This proposed rule would have no adverse impact on children. Accordingly, under E.O. 13045, no further Agency action or analysis is required.

EXECUTIVE ORDER 13132: FEDERALISM

Executive Order (E.O.) 13132 requires MSHA to develop an accountability process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have “federalism implications.” Policies that have federalism implications are defined as having “substantial direct effects on the States, on the relationship between the

national government and the States, or on the distribution of power and responsibilities among the various levels of government.” The proposed rule would place new requirements on underground coal mine operators in providing and training mine rescue teams. These proposed changes would not directly affect States or their relationships with the federal government. Although the proposed rule does not directly affect States, some States sponsor mine rescue teams. Consistent with the spirit of E.O. 13132, MSHA specifically solicits comments on this proposed rule from State officials.

EXECUTIVE ORDER 13175: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

This proposed rule would not have “tribal implications,” because it would not “have substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes.” Accordingly, E.O. 13175 requires no further Agency action or analysis.

EXECUTIVE ORDER 13211: ACTIONS CONCERNING REGULATIONS THAT SIGNIFICANTLY AFFECT ENERGY SUPPLY, DISTRIBUTION, OR USE

Executive Order 13211 requires agencies to publish a statement of energy effect when a rule has a significant energy action that adversely affects energy supply, distribution, or use. MSHA has reviewed the proposed rule because it applies to the underground coal mining industry. Because this proposed rule would result in yearly costs of approximately \$3.0 million to the underground coal mining industry, relative to annual revenues of \$13.1 billion in 2006, it would not be likely to have a significant adverse effect on the supply, distribution, or use of energy, and thus, would not be a significant energy action. Accordingly, E.O. 13211 requires no further Agency action.

VII. PAPERWORK REDUCTION ACT OF 1995

INTRODUCTION

The purpose of this chapter is to show the burden hours and related costs to underground coal mine operators as a result of the proposed rule. The costs in this chapter are derived from Chapter IV of this PREA. However, in this chapter, costs are estimated only in relation to the burden hours that the proposed rule would impose. Therefore, not all costs derived in Chapter IV appear below. Those costs derived in Chapter IV that do not have information collection burden hours related to them do not appear in this chapter.

SUMMARY OF PAPERWORK BURDEN HOURS AND RELATED COSTS

The mine rescue team proposed rule would continue the existing paperwork burden requirements and impose several new paperwork burden requirements. Proposed § 49.16 would continue to require certification of inspection and testing of breathing apparatus, as well as a record of any corrective action taken for breathing apparatus. Proposed § 49.18 would continue to require a record of each new mine rescue team member's training. The Office of Management and Budget (OMB) has approved these requirements, which are in existing §§ 49.6 and 49.8, under OMB control number 1219-0078. In addition, proposed § 49.50 would impose a new annual paperwork burden for mine operators to certify that each designated mine rescue team meets the requirements of this part and proposed § 75.1501(a) would require mine operators to certify that each responsible person has completed the required mine emergency response training.

Overall, the underground coal industry would incur approximately 1,374 paperwork burden hours annually with associated paperwork burden costs of approximately \$51,546.

§ 49.16 Equipment and Maintenance Requirements.

Proposed § 49.16(b) requires a person trained in the use and care of breathing apparatus to inspect and test the apparatus at intervals not exceeding 30 days and certify by signature and date that the inspections and tests were done. When the inspection indicates that a corrective action is necessary, the corrective action shall be made and the person shall record the corrective action taken. The certification and the record of corrective action must be maintained at the mine rescue station for a period of one year and made available upon request to an MSHA inspector.

This proposed requirement would impose paperwork burden on the 28 new mine rescue stations estimated to be created in response to the proposed rule. MSHA requires that each mine rescue station have at least 12 breathing apparatus. MSHA estimates that it takes an average of 6 minutes (0.1 hours) to certify and file the certification for each apparatus. MSHA further estimates that, on average, each apparatus requires corrective action six times a year and that it would take approximately 15 minutes (0.25 hours) to record and file each corrective action. MSHA's experience is that team members inspect, maintain, and certify the apparatus and record the corrective actions. Table VII-1 shows the burden hours and costs associated with the requirement in proposed § 49.16(b).

Table VII-1: Paperwork Burden Hours and Costs Associated with Equipment Maintenance Requirements in Proposed § 49.16

Mine Size	# of New Mine Rescue Stations ^a	Time to Certify & File the Certification for Each Apparatus (hours) ^b	Time to Record & File Corrective Actions (hours) ^c	Total Paperwork Burden Hours ^d	Total Annual Burden Cost ^e
(1-19) Employees	19	273.6	342	616	\$15,993
(20-500) Employees	9	129.6	162	292	\$7,576
(501+) Employees	0	0	0	0	\$0
Total	28	403.2	504	907	\$23,569

^a Source: Table IV-4.

^b Time to certify & file the certification for each apparatus = (# of new mine rescue stations x A x 12 x T), where A is the # of apparatus per new mine rescue station (A=12); 12 is the # of inspections per year; and T is the time needed to certify and file the certification for each apparatus (T=0.1 hours).

^c Time to record & file corrective actions = (# of new mine rescue stations x A x 6 x T) , where A is the # of apparatus per new mine rescue station (A=12); 6 is the # of corrective actions taken a year for each apparatus; and T is the time it would take to record and file it (T=0.25 hours).

^d Total burden hours = (time to certify & file the certification for each apparatus + time to record & file corrective actions).

^e Total annual burden cost = total paperwork burden hours x W_t , where W_t is the hourly wage rate for a team member (W_t =\$25.98).

§ 49.18 Training for Mine Rescue Team Members.

Under proposed § 49.18, a record of training for each team member must be kept on file at the mine rescue station for a period of one year. MSHA estimates that the trainer would need approximately 12 minutes (0.20 hours) to make, file, and maintain a record of training for each new team member. Table VII-2 summarizes the burden hours and costs associated with the recordkeeping requirement of this proposed section.

Table VII-2: Annual Burden Hours and Costs to Record Training for Members of New Mine Rescue Teams in Proposed § 49.18

Type of Team	# of Hours to Record Training for New Team Members ^a			Cost to Record Training for New Team Members ^b			Total Annual Cost
	(1-19) Employees	(20-500) Employees	(501+) Employees	(1-19) Employees	(20-500) Employees	(501+) Employees	
Mine Site	0	0.0	0	\$0	\$0	\$0	\$0
Composite	0	56.0	0	\$0	\$3,500	\$0	\$3,500
Contract or State	0	0.0	0	\$0	\$0	\$0	\$0
Total	0	56.0	0	\$0	\$3,500	\$0	\$3,500

^a # of hours to record training for new team members = # of new team members x T_s , where the # of new team members comes from Table IV-6; T_s is the average # of hours for a trainer to prepare the certification for each new team member and file it at the mine rescue station ($T_s=0.20$ hours).

^b Cost to to record training for new team members = (# of hours to record training for new team members x W_s), where W_s is the hourly wage rate for a trainer ($W_s=\$62.50$).

§ 49.50 Certification of Mine Rescue Teams.

Proposed § 49.50 requires that for each mine rescue team designated to provide mine rescue coverage at an underground coal mine, the mine operator must send the District Manager an annual statement certifying that each team meets the certification criteria. Each underground coal mine operator would have to certify two mine rescue teams. MSHA estimates that it would take a mine supervisor approximately 30 minutes (0.5 hours) to certify two mine rescue teams, and a clerical employee one minute (0.167 hours) to send MSHA the certification. Table VII-3 shows the paperwork burden hours and costs to certify mine rescue teams.

Table VII-3: Annual Burden Hours and Costs for Mine Operators to Certify Two Mine Rescue Teams in Accordance with § 49.50

Mine Size	# of Underground Coal Mines ^a	Annual Burden Hours per Mine Operator ^b	Total Annual Cost ^c
(1-19) Employees	220	113.7	\$6,955
(20-500) Employees	420	217.0	\$13,277
(501+) Employees	13	6.7	\$411
Total	653	337.4	\$20,643

^a Source: Table IV-2.

^b Annual cost for a mine operator to certify two teams = $[(T_s + T_c) \times \# \text{ of underground coal mines}]$, where T_s is the number of hours it would take for a mine supervisor to certify two teams ($T_s=0.5$ hours); and T_c is the # of hours it would take a clerical employee to mail the certification ($T_c=0.0167$ hours).

^c Cost for a mine operator to certify two teams = $[(T_s \times W_s) + (T_c \times W_c)]$, where T_s is the number of hours it would take for a mine supervisor to certify two teams ($T_s=0.5$ hours); W_s is the hourly wage rate for a mine supervisor ($W_s=\$62.50$); T_c is the # of hours it would take a clerical employee to mail the certification ($T_c=0.0167$ hours); W_c is the hourly wage rate for a clerical employee ($W_c=\$21.78$).

§ 75.1501 Emergency Evacuations.

The MINER Act requires the operator to have a person employed on each shift who is knowledgeable in mine emergency response. Proposed § 75.1501 would amend existing § 75.1501 (a) to require that the responsible person also have current knowledge about the mine’s ERP. It would also require the responsible person be trained annually in mine emergency response coordination and communication.

MSHA believes that there would be a backup for the responsible person for each shift because there would be times when the responsible person could not be at the mine site. The operator must certify by signature and date after each responsible person has completed the training and keep the certification at the mine for one year. It would take a mine supervisor approximately 90 seconds (0.025 hours) to certify the training and it would take a clerical employee half a minute (0.00833 hours) to file the training certification. On average, mines with 1-19 employees operate one shift, mines with 20-500 employees operate two shifts, and mines with 501+ employees operate three shifts. Table VII-4 presents the annual burden hours and costs associated with certifying the training of a responsible person and a backup person in accordance with this proposed section.

Table VII-4: Annual Burden Hours and Costs to Certify the Training of a Responsible Person in Accordance with § 75.1501

Mine Size	# of Underground Coal Mines ^a	Average # of Shifts	Total # of Annual Burden Hours to Certify a Responsible Person ^b	Annual Cost to Certify a Responsible Person ^c
(1-19) Employees	220	1	14.7	\$767
(20-500) Employees	420	2	56.0	\$2,930
(501+) Employees	13	3	2.6	\$136
Total	653		73.3	\$3,833

^a Source: Table IV-2.

^b Total # of annual burden hours to certify the training of a responsible person = $[(T_s + T_c) \times N \times S \times \# \text{ of underground coal mines}]$, T_s is the # of hours it would take for another supervisor to certify the responsible person or the backup receiving training ($T_s=0.025$ hours); T_c is the # of hours that it would take a clerical employee to file the training certification ($T_c=0.00833$ hours); N is the # of people who need to be certified ($N=2$); and S is the # of shifts.

^c Annual cost to certify the training of a responsible person = $[(T_s \times N \times S \times W_s) + (T_c \times N \times S \times W_c)] \times \# \text{ of underground coal mines}$, where T_s is the # of hours it would take for another supervisor to certify that the responsible person or the backup received the training ($T_s=0.025$ hours); N is the # people who need to be certified ($N=2$); T_c is the # of hours that it would take a clerical employee to file the training certification ($T_c=0.00833$ hours); S is the # of shifts; W_s is the hourly wage rate for a mine supervisor ($W_s=\$62.50$); and W_c is the hourly wage rate for a clerical employee ($W_c=\$21.78$).

VIII. REFERENCES

- Jennifer B. Leinart, compiler, *U.S. Coal Mine Salaries, Wages, and Benefits: 2005 Survey Results* (Spokane, Washington: Western Mine Engineering, Inc.), 2005.
- U.S. Department of Energy, Energy Information Administration, *Annual Energy Outlook 2005*, February 2005.
- U.S. Department of Energy, Energy Information Administration, *Annual Energy Review 2005*, July 2006.
- U.S. Department of Energy, Energy Information Administration, *Annual Coal Report 2005*, October 2006.
- U.S. Department of Labor (DOL), Mine Safety and Health Administration (MSHA), Office of Program Evaluation and Information Resources (PEIR), 2006 data, March 27, 2007 Teradata run.
- U.S. Department of Labor (DOL), Mine Safety and Health Administration (MSHA), MSHA web page <http://www.msha.gov/MineRescue/CONTEST/2007Coal/Rules/2007Rules.asp>, March 29, 2007.