PRELIMINARY REGULATORY ECONOMIC ANALYSIS

AND

PRELIMINARY REGULATORY FLEXIBILITY ANALYSIS

PROPOSED RULE ON 30 CFR PART 75

IMPROVING AND ELIMINATING REGULATIONS

PHASE 5 MISCELLANEOUS

TECHNOLOGY IMPROVEMENTS (METHANE TESTING)

RIN: 1219-AA98

Office of Standards, Regulations, and Variances
Mine Safety and Health Administration
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I. EXECUTIVE SUMMARY

INTRODUCTION

We, the Mine Safety and Health Administration (MSHA), are proposing to revise our existing safety standards for underground coal mine ventilation. The proposal would provide an alternative means to test for methane. Section 101 of the Federal Mine Safety and Health Act of 1977 provides the authority for this rulemaking.

We do not consider this rulemaking to be economically significant under Executive Order 12866. Based upon this Preliminary Regulatory Economic Analysis (PREA), we have determined that the proposed rule would not have an annual effect of $100 million or more on the economy.

BENEFITS SUMMARY

As discussed in Chapter III of this PREA, the proposed rule would increase mine efficiency and provide at least an equivalent level of safety to miners.

COMPLIANCE COST SUMMARY

The proposed rule would result in net cost savings of approximately $6.6 million annually. These net cost savings are primarily due to the reduced time needed to perform methane gas checks under the proposed rule.

REGULATORY FLEXIBILITY CERTIFICATION AND ANALYSIS

In accordance with section 605 of the Regulatory Flexibility Act, we certify 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 Regulatory Flexibility Act, we must include in the proposed rule a factual basis for this certification. The Agency must also publish the regulatory flexibility certification statement in the Federal Register, along with the factual basis, followed by an opportunity for the public to comment. The analysis that provides the factual basis for this certification is discussed in Chapter V of this document and will be included in the preamble to the proposed rule for publication in the Federal Register. We have consulted with the Small Business Administration's (SBA's) Office of Advocacy and believe 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 coal mining industry. We will focus on the underground coal mining sector wherever such data are available since the proposed rule would affect only underground coal mines.

The industry profile captures data on the number of mines, mine size, and mine employment. A detailed economic picture of the coal mining industry is difficult to develop because most mines are either privately held corporations, sole proprietorships, or subsidiaries of publicly owned companies. Privately held corporations and sole proprietorships are not required to make their financial data available to the public. Further, parent companies are not required to separate financial data for subsidiaries in their reports to the Securities and Exchange Commission. As a result, financial data are available for only a few coal and metal/nonmetal (M/NM) companies. Such data are not representative of the entire mining community.

THE STRUCTURE OF THE COAL MINING INDUSTRY

MSHA divides the mining industry into two major sectors, which are coal mines and M/NM mines. The value of the U.S. mining industry for both coal and M/NM production in 2000 was estimated at about $57.9 billion, or 0.6 percent of 2000 Gross Domestic Product (GDP). Coal mining contributed about $17.7 billion to the GDP.[1] The M/NM mining sector contributed about $40.2 billion. These two sectors are further divided by operation type (i.e., underground mines or surface mines). The Agency maintains its own data on the number of mines, mine type, size, and employment. Also, MSHA collects data on the number of independent contractors and contractor employees by major industry sector.

MSHA categorizes mines by size based on employment. For the past 20 years, for rulemaking purposes, the Agency has consistently defined a small mine to be one employing fewer than 20 employees and a large mine to be one employing 20 or more employees. However, to comply with the requirements of the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the Regulatory Flexibility Act (RFA), MSHA must use the Small Business Administration's (SBA's) criteria for a small entity when determining a rule's economic impact. For the mining industry, SBA defines a small entity as one employing 500 or fewer employees.

Table II-1 presents the number of small and large underground and surface coal mines and their employment, excluding contractor firms and contractor workers. These

[1] U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources, 2000 data. GDP came from U.S. Department of the Interior, U.S. Geological Survey, Mineral Commodity Summaries 2001, January 2001, p.4. Average U.S. coal price from Department of Energy, Energy Information Administration, Coal Industry Annual 2000, June 2002, Table 80, p.206.

mines reported production during some portion of the calendar year 2000. Table II-1 uses three mine size categories based on employment: (1) fewer than 20 employees (MSHA's traditional small mine definition); (2) 20 to 500 employees; and (3) more than 500 employees. Table II-1 shows that, of all coal mines, about 35 percent are underground and employ about 53 percent of miners, while 65 percent are surface and employ about 47 percent of miners.

Table II-1: Distribution of Coal Operations and Employment (Excluding Contractor Firms and Contractor Workers) by Mine Type and Size, 2000

Mine Type	Size of Coal Mines *									All Coal Mines		
	< 20 Employees			20 to 500 Employees			> 500 Employees					
	Mines	Miners	Office Emp.	Mines	Miners	Office Emp.	Mines	Miners	Office Emp.	Mines	Miners	Office Emp.
Underg.	268	2,586	95	393	31,896	895	3	1,651	59	664	36,133	1,049
Surface	835	5,191	432	398	25,375	1,833	3	1,661	71	1,236	32,227	2,336
Total	1,103	7,777	527	791	57,271	2,728	6	3,312	130	1,900	68,360	3,385

*Based on MSHA's traditional definition, small mines are those in the <20 employees category. Based on SBA's definition, small mines are those in the <20 employees and 20 to 500 employees categories.

Source: U.S. Department of Labor Mine Safety and Health Administration, Office of Program Evaluation and Information Resources, calendar year 2000 data.

Agency data in Table II-1 indicate that there were 664 underground coal mines that reported production during some portion of calendar year 2000. When applying MSHA's small mine definition (fewer than 20 workers), 268 (about 40 percent) were small mines and 396 (about 60 percent) were large mines. Using SBA's small mine definition, 3 mines (0.5 percent) were large mines and the rest were small mines.

Underground coal mine employment in 2000 was 37,182, of which 36,133 were miners and 1,049 were office workers. Based on MSHA's small mine definition, 2,586 coal miners (7 percent of underground coal miners) worked at small mines and 33,547 miners (93 percent of underground coal miners) worked at large mines. Using SBA's small mine definition, 34,482 coal miners (95 percent of underground coal miners) worked at small mines and 1,651 coal miners (5 percent of underground coal miners) worked at large mines. Based on the Agency's small mine definition, on average, each small underground coal mine employed 10 miners and each large coal mine employed 85 miners. Using SBA's small mine definition, on average, each small coal mine employed 52 miners and each large coal mine employed 550 miners.

Table II-2 presents corresponding data on the number of independent coal contractors and their employment for calendar year 2000. Table II-2 shows that there were 875 underground coal contractors. Using MSHA's definition of a small mine, 771 (88 percent) were small and 102 (12 percent) were large. When applying SBA's definition, all of the underground coal contractors were small.

Table II-2: Distribution of Coal Contractor Firms and Contractor Employment by Size of Operation, 2000

Contr. Type	Size of Coal Contractor *									All Coal Contractors		
	< 20 Employees			20 to 500 Employees			> 500 Employees					
	Firms	Emp.	Office Emp.	Firms	Emp.	Office Emp.	Firms	Emp.	Office Emp.	Firms	Emp.	Office Emp.
Underg.	771	3,183	243	102	5,220	357	0	0	0	875	8,531	652
Surface	1,715	7,443	568	247	12,707	870	2	1,025	221	1,962	21,047	1,607
Total	2,486	10,626	811	349	17,927	1,227	2	1,025	221	2,837	29,578	2,259

* Based on MSHA's traditional definition, small contractors are those in the <20 employees category. Based on SBA's definition, small contractors are those in the <20 employees and 20 to 500 employees categories.

Source: U.S. Department of Labor Mine Safety and Health Administration, Office of Program Evaluation and Information Resources, 2000 data, and U.S. Department of Labor, Mine Safety and Health Administration, 2000 Final Data, CT441 Report, cycle 2000/207.

Table II-2 shows that there were 875 underground coal contractor firms employing a total of 9,183 contractor workers, of which 8,531 worked in underground coal mining operations and another 652 worked in offices. Using MSHA's small mine definition, 3,183 (37 percent) of contractor workers, excluding office workers, worked for small contractors while 5,220 (73 percent), excluding office workers, worked for large contractors. When applying SBA's definition of a small entity, all 8,531 contractors (100 percent) worked for small contractors.

ECONOMIC CHARACTERISTICS OF THE COAL MINING INDUSTRY

Coal mining in the U.S. can be classified into two major commodity groups: bituminous and anthracite. About 91 percent of total coal production is bituminous. The remaining 9 percent of production is lignite and anthracite.[2]

Mines east of the Mississippi River accounted for about 47 percent of coal production in 2000. For the period 1949 through 2000, coal production east of the Mississippi River fluctuated relatively little, from a low of 395 million tons in 1954 to a high of 630 million tons in 1990; 2000 production was estimated at 509 million tons. During this same period, however, coal production west of the Mississippi increased each year from a low of 20 million tons in 1959 to a record high of 571 million tons in 1999; production in 2000 was estimated at 566 million tons.[3] Growth in western coal mines, in part, is due to environmental concerns that increase demand for low-sulfur coal, which is in abundance in the West. In addition, surface mining, with its higher average productivity, is much more prevalent in the West.

[2] U.S. Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, Table 7.2, p. 201.

[3] U.S. Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, Table 7.2, p. 201.

The U.S. coal sector produced approximately 1.05 billion short tons of coal in 2000, at an average price of $16.78 per ton. The total value of U.S. coal production in 2000 was estimated at $17.7 billion.[4] Based on MSHA's definition, small mines produced about 34.9 million tons, or about 3 percent of domestic coal production valued at $586 million, and large mines produced about 1.02 billion tons, or about 97 percent of domestic coal production valued at $17.08 billion. Based on SBA's definition of small mines, they produced 0.9 billion tons, or about 85 percent of domestic coal production valued at $15.1 billion.[5]

Average domestic coal prices (nominal and real prices) for the period 1950-1999 are presented in Table II-3. The nominal price is the price not adjusted for inflation. The real price is the price of coal after it has been adjusted for inflation by using constant dollars from a particular year (in Table II-3, the real price is in terms of 1996 dollars). During this period the inflation-adjusted, or real, price of coal has generally declined. The one exception was a spike in coal prices during the OPEC petroleum price increases in the 1970s. The real price of coal in 1999 was approximately 46 percent lower in 1999 than in 1950.[6] The real price of coal per Btu was approximately 38 percent lower in 2000 than in 1950, which has caused coal to become the least expensive of the major fossil fuels in terms of dollars per Btu.[7]

[4] U.S. Department of Labor Mine Safety and Health Administration, Office of Program Evaluation and Information Resources, 2000 data. Average U.S. coal price from Department of Energy, Energy Information Administration, Coal Industry Annual 2000, June 2002, Table 80, p. 206.

[5] *Ibid.*

[6] US Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, Table 7.8, p. 213.

[7] US Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, Table 3.1, p. 67. Coal energy (per Btu) was more expensive than natural gas energy in 1950, but was less expensive in 1999. Both coal and gas energy were less expensive than crude oil energy in 1950 and 1999.

Table II-3: Coal Prices 1950-1998
(Dollars per Short Ton)

Year	Nominal Price ($ per Short Ton)	Real Price (1996 $ per Short Ton)	Nominal Price ($ per Million BTU)	Real Price (1996 $ per Million Btu)
1950	5.19	29.74	0.21	1.19
1955	4.69	23.71	0.19	0.94
1960	4.83	21.77	0.19	0.87
1965	4.55	19.13	0.18	0.77
1970	6.34	21.82	0.27	0.92
1975	19.35	48.34	0.84	2.11
1980	24.65	43.22	1.10	1.93
1985	25.20	34.20	1.15	1.56
1990	21.76	25.15	1.00	1.15
1991	21.49	23.97	0.99	1.10
1992	21.03	22.90	0.97	1.06
1993	19.85	21.11	0.93	0.99
1994	19.41	20.22	0.91	0.94
1995	18.83	19.19	0.88	0.90
1996	18.50	18.50	0.87	0.87
1997	18.14	17.79	0.85	0.84
1998	17.67	17.12	0.82	0.80
1999*	16.63	15.87	0.80	0.76
2000*	16.78	15.69	0.80	0.74

Source: US Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, p. 213, Table 7.8; p. 67, Table 3.1.

* Prices per short ton come from US Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, Table 80 and Table 81, pp. 206-207.

MINING INDUSTRY OUTLOOK

The U.S. coal industry enjoys a fairly constant domestic demand. About 92 percent of U.S. coal demand was accounted for by electric power producers in 2000.[8] Domestic coal demand is projected to increase because of growth in coal use for electricity generation. Coal consumption for electricity generation is projected to increase as the utilization of existing coal-fired generation capacity increases and as new capacity is added. The average utilization rate is projected to increase from 72 percent in 2000 to 84 percent in 2020. The amount of U.S coal exported in 1999 was 58 million tons (about 5 percent of production). These exports are projected to remain relatively stable in the future, until settling at 56 million tons by 2020.[9]

[8] U.S. Department of Energy, Energy Information Administration, Annual Energy Review 2000, August 2001, Table 7.3, p. 203.

[9] U.S. Department of Energy, Energy Information Administration, Annual Energy Outlook 2002. December 2001, p. 95.

III. BENEFITS

BACKGROUND

On-shift examinations of working sections have long been accepted as a standard safety practice in coal mining. These examinations ensure that the working environment is safe while miners work during the shift by identifying existing or developing hazards, and permitting rapid correction of hazardous conditions before miners are endangered. Because mining conditions are variable and hazards can develop quickly, on-shift examinations are required at least once per shift, and more often if necessary for safety.

Methane tests are a key part of the on-shift examination. Methane is an invisible, odorless, and highly-flammable product of coal off-gassing. Miners use various instruments to detect and monitor methane in the mine. Methane at the face liberates from the coal either at its surface or from pieces of broken coal that have been crushed by the mining machine. Methane liberated at the face is more trapped, and thus may accumulate after the cut is made unless the face is adequately ventilated. Methane in the roof liberates through pockets called roof feeders, either spontaneously as the methane travels to the area of the cut or as the result of roof bolting operations.

The most serious hazard that methane presents to miners is an ignition which can result in a fire or an explosion. Frictional methane ignitions in mining occur when hot metal shavings from either cutting bits or drill bits on mining equipment contact the liberated methane. Proper ventilation, as provided by an approved ventilation plan, dilutes and removes liberated methane so that the remaining levels will be too low to ignite.

The coal mining industry has expanded its use of a number of mining methods aimed at increasing production. One such method is deep cut mining, also called extended cut mining, wherein the continuous mining machine makes cuts greater than 20 feet into the coal seam. Formerly, most continuous mining machines were operated by an on-board miner positioned in the cab at the rear of the machine. The cutting length was limited to the distance between the cutting head and the cab, or about 20 feet, to protect the miner in the cab from hazards associated with unsupported roof, coal dust, and methane. Today, most continuous mining machines are manufactured to operate with remote control devices. Operating the continuous mining machine by remote control allows the machines to cut well beyond 20 feet into the coal seam without endangering an on-board miner.

BENEFITS OF THE PROPOSED RULE

The rule provides the operator an alternative method to make section 75.362 methane tests during roof bolting activities in room and pillar mining operations using continuous mining machines or conventional equipment. The proposed rule provides at least an equivalent level of safety to persons working on those sections, including the roof bolters who are called upon to conduct the bolting task on a routine basis and are directly affected if the alternative method is adopted for use. The methane monitor

permanently mounted on the T-bar of the automated temporary roof support (ATRS) would enhance miner safety by providing constant methane readings in the immediate area where the roof bolts are being installed.

The alternative testing allowed by the proposed rule would have two major requirements. The first requirement is that every roof bolting machine have an integral ATRS to which a methane monitor is permanently mounted. Methane ignitions during roof bolting activities usually occur because sparks or hot metal fragments from the drill bits contact an ignitable concentration of methane. The monitoring system on a roof bolting machine promotes safety by continuously monitoring the atmosphere at the roof bolting site during bolting. The system would give a warning signal when methane levels reach one percent and would automatically shut down the machine when methane levels reach two percent. A methane-air mixture of between 5% and 15% methane will ignite.

The second requirement is that a methane test be taken every 20 minutes. The methane test shall be conducted by sweeping the probe not less than 16 feet inby the last permanent roof support, unless the probe can reach the face. Whenever the probe can reach the face, the test shall be taken from a location at least 12 inches from the roof, face, and rib. It is anticipated that a probe no longer than 20 feet would be sufficient to conduct this test, as opposed to the much longer probe required in the existing regulation. Under the current rule, for the miner to be under supported roof while making this test in a deep cut requires the use of a long probe. The longer probes bend and can be difficult to guide.

SUMMARY

In addition to cost savings, the implementation of the proposed rule would result in several benefits. The ability to have a continuous reading for methane together with the 20-minute methane checks provides at least the same level of protection for miners performing roof bolting activities. In addition, miners would be informed as soon as the concentration of methane exceeds one percent at the location of the roof bolting machine. Also, the roof bolting machine would automatically de-energize at 2 percent of methane.

IV. COST OF COMPLIANCE

INTRODUCTION

In this chapter, we estimate the total costs that underground coal mine operators would incur to comply with proposed safety standards for underground coal mine ventilation. We conclude that the proposed rule, covered by 30 CFR part 75, would generate net cost savings of approximately $6.6 million yearly.

For the purposes of the cost analysis, we used our traditional definition of a small mine as one employing fewer than 20 workers, and a large mine as one employing 20 or more workers. Based on 2000 data, the proposed rule will cover about 664 underground coal mines. Of this total, about 268 (or 40%) employ fewer than 20 workers. The estimated yearly net cost savings of complying with the proposed rule would be approximately $0.8 million for small coal mine operators. For large mines, yearly net cost savings would be about $5.8 million. Table IV-1 summarizes the estimated yearly net compliance savings of the proposed rule by mine size and by provision.

TABLE IV-1: Summary of Yearly Compliance Costs and Cost Savings of the Proposed Rule*

Provision §	Coal			Total
	Small (< 20)	Large (20-500)	Large (> 500)	
(d)(3)	($6,877)	($49,373)	($2,258)	($58,509)
(d)(3)ii[1]	$79,003	$566,855	$25,912	$671,771
(d)(3)iv	($847,553)	($6,084,669)	($278,301)	($7,210,523)
Total	($775,427)	($5,567,187)	($254,647)	($6,597,261)

*Source: Table IV-3, Table IV-4, Table IV-5, Table IV-6, and Table IV-7. Negative numbers (cost savings) in parentheses.

[1] Derived from Table IV-4,Table IV-5, and Table IV-6.

All cost estimates in this chapter are presented in 2000 dollars. The total cost savings reported in Table IV-1, and in all other tables in this chapter, are, to the best of our knowledge, the result of accurate calculations. In some cases, however, the totals may appear to deviate from the sum or product of their component factors, but that is only because the component factors have been rounded in the tables for purposes of readability.

METHODOLOGY

For this proposed rule, we estimated the following, as appropriate: (1) non-annual recurring cost; and (2) annual costs. Recurring costs are those that are incurred once every X number of years. Capital expenditures, such as the cost of purchasing

compliance equipment that needs to be replaced every X number of years, are an example of recurring costs. For the purposes of this PREA, recurring costs have been annualized using an annual discount rate of 7%, as required by the U.S. Office of Management and Budget (OMB), using the formula:

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

where

a = the annualization factor,

i = the annual discount rate, and

n = the economic life of the non-annual recurring investment.

Converting non-annual recurring costs to annualized costs allows them to be added to annual costs in order to compute the total yearly costs of a rule. Annual costs are costs that normally recur annually. One example of an annual cost is (annual) maintenance costs.

We used an hourly compensation rate $27.56 for a coal miner; $54.53 for a coal supervisor; $20.18 for a clerical worker; $28.28 for an electrician.[10] These figures include benefits such as social security, unemployment insurance, and workers' compensation, but they do not reflect shift differentials or overtime pay. For convenience, we will refer to miner "compensation" in this PREA as "wages," where that term is understood to include benefits. We assume that contractor workers receive the same wage as their fellow coal miners.

SCOPE

This proposed rule would apply to underground coal mines that mine deep cuts and use roof bolting machines with ATRS systems. This proposed rule provides an alternative method for mine operators to conduct methane tests in underground coal mines during roof bolting; therefore, they are not required to use this alternative approach. We anticipate that only underground coal mines that have deep cuts of 20 feet or more would elect to take advantage of this option. Approximately 25 percent of underground coal mines that employ fewer than 20 miners, 75 percent of underground coal mines that employ 20 to 500 miners, and 100 percent of underground coal mines that employ over 500 miners meet this condition. Table IV-2 presents our estimate of the total number of underground coal operations that would take advantage of this option, along with the number of roof bolters in those mines.

[10] Schumacher, Otto L., ed. Western Mine Engineering, Mine Cost Service. Spokane, Washington: Western Mine Engineering, 2001.

Table IV-2: The Number of Mines That Would be Affected by the Proposed Rule

Mine Size	Total # of Mines[a]	# of Mines Affected[b]	# of Roof Bolters in Affected Mines[c]
Small (< 20)	268	67	67
Large (20-500)	393	295	481
Large (< 500)	3	3	22
Total	664	365	570

[a] Total # of mines comes from Table II-1.

[b] # of mines that would be affected = (N x P), where N is the total number of mines, and P is the percentage of mines that would elect to take advantage of the alternative approach provided by the proposed rule and [P = 25% for small mines (<20); P = 75% for large mines (20-500); and P = 100% for large mines (<500)].

[c] Data provided by Coal Mine Safety and Health, FY 2000.

SECTION-BY-SECTION DISCUSSION

§ 75.362 (d)(2)

Proposed section 75.362 (d)(2) would reference the alternative method for conducting methane tests. It is informational in nature, and we do not associate any costs with it.

§ 75.362 (d)(3)

Proposed section 75.362 (d)(3) would allow an alternative method of compliance wherein the required methane tests could be made by using a probe to sweep not less than 16 feet inby the last permanent roof support. This can be accomplished by using a 20-foot probe. The current regulation allows mine operators to conduct methane tests by using various length probes along with configurations of tubing attached to gas pumps and handheld methane detectors or large readout methane meters. Mine operators are currently using various length probes that reach the face area along with tubing, gas pumps, large readout methane meters, and cradles (the attachment that connects the probe to the handheld methane detector) to comply with the existing regulation. The average size of various length probes used to test for methane gas is about 40 feet.

To satisfy the requirement of the proposed rule, mine operators can continue to use the cradles, handheld methane detectors, and large readout meters to test for methane. The only change that mine operators need to adopt under this section is to substitute the 20-foot probes for the much longer probes. However, they do not have to replace the longer probes for the 20-foot probes right away. They can continue to use the longer probes for another three years, or until they wear out, before having to replace them. The average cost for a 20-foot probe is $120, and the average cost for longer probes is $450. Therefore, there would be cost savings associated with the proposed standard. The cost savings are summarized in Table IV-3 below.

Table IV-3: Cost Savings to Replace Various Length Probes with 20-Foot Ones

Mine Size	The # of Various Length Probes in Underground Coal Mines[a]	Annualized Unit Cost Savings to Replace the Various Length Probes[b]	Total Annualized Cost	Annual Cost[c]
Small (< 20)	67	($126)	($8,425)	($6,877)
Large (20-500)	481	($126)	($60,484)	($49,373)
Large (< 500)	22	($126)	($2,766)	($2,258)
Total	570		($71,676)	($58,509)

[a] The total # of various length probes in underground coal mines = total # of roof bolters in affected mines (from Table IV-2). A long probe is currently used in conjuction with roof bolters that mine deep cuts.

[b] Annualized cost to replace the various length probes = [A x (C_{20} - C_v)], where A is the annualization factor for three years (A = 0.38), C_{20} is the average cost for a 20-foot probe (C_{20} = $120), and C_v is the average cost for a 40-foot probe (C_v = $450). (The useful life of both the 40 and 20-foot probes is three years.)

[c] Annual cost = (S x P), where S is the total annualized cost and P is the present value factor for three years [P = 1/(1+.07)^3 = 0.816]. (Mine operators do not have to make the first purchase for 20-foot probes until year 3.)

§ 75.362 (d)(3)(i)

Proposed section 75.362 (d)(3)(i) would require that the roof bolting machine be equipped with an integral ATRS system. We do not anticipate that there would be a cost associated with this section. Generally, only underground coal mines working in less than 30 inches of mining height do not have roof bolting machines equipped with ATRSs and could not take advantage of this alternative to monitor methane. There are only a very few mines that fall into this category. In addition, all roof bolting machines manufactured after 1988 are required to have an integral automated temporary support under section 75.209.

§ 75.362 (d)(3)(ii)

Before a mine operator can make modification to approved permissible equipment (roof bolter), the mine operator must submit an application to MSHA's Approval and Certification Center. Separate applications are needed for each roof bolter model unless they are of the same type. For example if a mine operator has two roof bolters of the same type, only one application is necessary. We estimated that, on average, mines that employ fewer than 20 employees would have to submit one application per mine. We estimated that there are 1.5 same roof bolter models per mine in the affected mines that

employ 20 to 500 employees. Therefore, the total number of applications is equal to total number of roof bolters divided by 1.5. Similarly, we estimated that there are 3 same roof bolter models per mine in the affected mines that employ more than 500 employees. The total number of applications is equal to the number of roof bolters in the affected mines divided by 3. It would take approximately 30 minutes to fill out such application and the postage cost and envelope is about $1 per application. Table IV-4 shows the cost estimate to comply with this requirement.

Table IV-4: Cost for Mine Operators to File Field Modification Applications

Mine Size	# of Roof Bolters in Affected Mines[a]	Average # of Same Roof Bolter Models per Mine	Total # of Field Modification Applications[b]	Cost for Filing Field Modification per Roof Bolter Model[c]	Total Cost[d]	Total Annualized Cost[e]
Small (< 20)	67	1	67	$ 28	$ 1,894	$ 133
Large (20-500)	481	1.5	321	$ 28	$ 9,064	$ 634
Large (< 500)	22	3	7	$ 28	$ 207	$ 15
Total	570				$ 11,165	$ 782

[a] # of roof bolters in affected mines comes from Table IV-2.

[b] Total # of field modification applications = # of roof bolters in affected mines / average # of same roof bolter models per mine.

[c] Cost for filing field modification per roof bolter model = [(W_s X T) + $1], where W_s is the hourly wage rate for a coal mine supervisor and W_s = $54.53; and T is the number of hours it would take for a coal mine supervisor to fill out the field modification application and T = 0.5; and $1 is the postage and envelope to send the application to MSHA's Approval and Certification Center.

[d] Total cost = cost for filing field modification per roof bolter model X total # of field modification applications.

[e] Total annualized cost = total cost X 0.07, where 0.07 is the annualization factor.

Every roof bolting machine equipped with an ATRS, and working in an underground coal mine with mining height greater than 30 inches, would require installation of a permanently mounted methane monitor. It would take two electricians seven hours each to install a methane monitor. A methane monitor costs $5,400, and under normal use, has an indefinite life span. Table IV-5 provides our estimate of the cost to purchase methane monitors.

Table IV-5: Cost for Mine Operators to Purchase Methane Monitors

Mine Size	# of Roof Bolters in Affected Mines[a]	Price of Methane Monitors	Installation Cost[b]	Total Cost	Total Annualized Cost[c]
Small (< 20)	67	$5,400	$396	$388,327	$27,183
Large (20-500)	481	$5,400	$396	$2,787,838	$195,149
Large (< 500)	22	$5,400	$396	$127,510	$8,926
Total	570			$3,303,674	$231,257

[a] # of roof bolters in affected mines comes from Table IV-2.

[b] Installation cost = (2 x W_e x T), where 2 is the number of electricians needed to install a methane moinitor, W_e is the hourly wage rate for electricians (W = $28.28), and T is the amount of time for the two electricians to install or replace a methane monitor (T = 7 hours).

[c] Total annualized cost = total cost X 0.07, where 0.07 is the annualization factor.

A methane monitor needs to be calibrated monthly. It would take a miner about 15 minutes, including one minute for record keeping, to carry out the task. In addition, sensors need to be replaced every year and cost $675 each. It would take a miner 30 minutes to replace a sensor. Table IV-6 provides the maintenance cost for methane monitors associated with this proposed rule.

Table IV-6: Cost to Maintain Methane Monitors

Mine Size	# of Roof Bolters in Affected Mines[a]	Annual Cost to Perform Monthly Calibration[b]	Annual Cost to Replace Sensors[c]	Annual Maintainance Cost[d]
Small (< 20)	67	$83	$689	$51,688
Large (20-500)	481	$83	$689	$371,072
Large (< 500)	22	$83	$689	$16,972
Total	570			$439,732

[a] # of roof bolters in affected mines comes from Table IV-2.

[b] Annual cost to perform monthly calibration = (H x W x 12), where H is the number of hours to perform monthly calibration and record keeping (H = 0.25 hours), W is the coal miner's hourly wage rate (W = $27.56), and 12 is the number of months in a year.

[c] Annual cost to replace sensors = [C +(W x H)], where C is the cost for a sensor (C = $675), W is the hourly wage rate for coal miners (W = $27.56), and H is the number of hours it takes for a miner to replace a methane sensor (H = 0.5 hours).

[d] Annual maintenance cost = (Annual cost to perform monthly calibration + annual cost to replace sensors).

§ 75.362 (d)(3)(iii)

This section addresses where the methane monitor sensor head should be mounted. There is no additional cost associated with this section.

§ 75.362 (d)(3)(iv)

The existing regulation requires mine operators to test for methane at 20-minute intervals, or more often if required in the approved ventilation plan at specific locations, during the operation of equipment in the working place.

To estimate the cost savings for this provision, we first estimate the cost related to testing for methane under the existing regulation (i.e., the time it takes mine operators to test for methane multiplied by the hourly wage rate of the person conducting the test). We then calculate the cost associated with testing for methane under the proposed rule in the absence of the existing regulation. The difference between them is the cost savings.

In a typical eight–hour work shift, MSHA estimates that each roof bolter machine would install bolts in five deep cuts. On average, mine operators need to take two methane checks per deep cut. That results in a total of 10 methane checks for each roof bolter in an eight-hour shift. Currently, it normally takes two miners five minutes each to check for methane each time. On the other hand, it would take only one miner one minute to perform the same task under the proposed rule because the probe is shorter and

easier to maneuver. MSHA estimates that there is one shift per day for mines that employ fewer than 20 workers and two shifts per day for mines employing at least 20 workers. The net result is that there would be cost savings because the total amount of time spent testing for methane under the proposed rule is less than time required under the existing one. Table IV-7 provides the cost savings to test for methane gas.

Table IV-7: Cost Savings to Monitor Methane Gas

Mine Size	# of Roof Bolters in Affected Mines[a]	Annual Cost to Monitor Methane Under Existing Regulation per Roof Bolter[b]	Annual Cost to Monitor Methane Under Proposed Rule per Roof Bolter[c]	Annual Cost Savings per Roof Bolter[d]	Total Annual Cost Savings
Small (< 20)	67	$14,056	$1,406	($12,650)	($847,553)
Large (20-500)	481	$14,056	$1,406	($12,650)	($6,084,669)
Large (< 500)	22	$14,056	$1,406	($12,650)	($278,301)
Total	570				($7,210,523)

[a] # of roof bolters in affected mines comes from Table IV-2.

[b] Annual cost to monitor methane under existing regulation per roof bolter = (N x 2 x T x W x S x D), where N is the number of times needed to monitor methane gas (N = 10), 2 is the number of miners that it takes to test for methane gas, T is the time it takes to monitor methane gas and T = 0.0833 hours (5 minutes), W is the hourly wage rate for coal miners (W = $27.56), S is the number of shifts worked in a typical underground coal mine [S = 1 for small mines (<20); S = 2 for large mines (20-500) and (<500)], and D is the number of days that underground coal mines operate in a year (D = 306).

[c] Annual cost to monitor methane under proposed rule per roof bolter = (N x 1 x T x W x S x D), where N is the number of times needed to monitor methane gas (N = 10), 1 is the number of miners that it takes to test for methane gas, T is the time it takes to monitor methane gas and T = 0.01667 hours (1 minute), W is the hourly wage rate for coal miners (W = $27.56), S is the number of shifts worked in a typical underground coal mine [S = 1 for small mines (<20); S = 2 for large mines (20-500) and (<500)], and D is the number of days underground that coal mines operate in a year (D = 306).

[d] Annual cost savings per roof bolter = (annual cost to monitor methane under proposed rule per roof bolter - annual cost to monitor methane under existing regulation per roof bolter).

§ 75.362 (d)(3)(v)

This section addresses the subsequent locations where the 20-minute methane tests must be made—once the probe reaches the immediate face area, the subsequent methane tests must be taken approximately one foot from the face, roof, and rib. There is no additional cost associated with this section.

§ 75.362 (d)(3)(vi)

The proposed section would allow MSHA district managers to require that the ventilation plan include the minimum air quantity and the position and placement of ventilation controls to be maintained during roof bolting. In most instances, no additional brattice cloth or ventilation curtain would be needed to comply with this requirement. The ventilation control device is present on the section for the cutting of

coal and would now be required for use during roof bolting. We do not anticipate that there would be any additional cost.

FEASIBILITY

As discussed below and in the preamble of the proposed rule, we have concluded that the requirements of the proposed rule would be technologically and economically feasible.

Technological Feasibility

All devices that would be required by the proposed rule are already available in the marketplace and have been used either in the U.S. or in the international mining community. Therefore, we have concluded that this proposed rule is technologically feasible.

Economic Feasibility

As previously stated in this chapter, the underground coal mining industry would derive a net savings of approximately $6.6 million yearly due to the proposed rule. We therefore conclude that the proposed rule would be economically feasible for this industry.

V. REGULATORY FLEXIBILITY CERTIFICATION AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

INTRODUCTION

In accordance with § 605 of the Regulatory Flexibility Act (RFA), the Mine Safety and Health Administration certifies that this 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 Regulatory Flexibility Act (RFA), MSHA must include in the proposal a factual basis for this certification. If the proposed rule does have a significant economic impact on a substantial number of small entities, then the Agency must develop an initial regulatory flexibility analysis.

DEFINITION OF SMALL MINE

Under the RFA, in analyzing the impact of a proposed rule on small entities, MSHA must use the SBA 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 taken such an action, and hence is required to use the SBA definition.

The SBA defines a small entity as an establishment with 500 or fewer employees (13 CFR 121.201). Most of the underground coal mines affected by this rulemaking fall into this category and hence can be viewed as sharing the special regulatory concerns which the RFA was designed to address.

MSHA is concerned, however, that looking only at the impacts of the proposed rule on all these mines does not provide the Agency with a complete picture on which to make decisions. Traditionally, the Agency has also looked at the impacts of its proposed rules on what the mining community refers to as "small mines"—those with fewer than 20 employees. The way these small mines perform mining operations is generally recognized as being different from the way large mines operate.

This analysis complies with the legal requirements of the RFA for an analysis of the impacts on "small entities" while continuing our traditional look at "small mines." MSHA concludes that it can certify 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 Agency has determined that this is the case both for mines with fewer than 20 employees and for those with 500 or fewer employees.

FACTUAL BASIS FOR CERTIFICATION

General Approach: The Agency's analysis of impacts on "small entities" and "small mines" begins with a "screening" analysis. The screening analysis compares the estimated compliance costs of the proposed rule for small entities in the affected sector to

the estimated revenues for that sector. When estimated net compliance costs for small entities in the affected sector are less than 1 percent of estimated revenues, or are negative, the Agency believes it is generally appropriate to conclude that there is not a significant impact on a substantial number of small entities. When estimated compliance costs approach or exceed 1 percent of revenue, it tends to indicate that further analysis may be warranted. The Agency welcomes comment on its approach in this regard.

Derivation of Costs and Revenues: In the case of this proposed rule, because compliance costs must be absorbed by only underground coal mines, the Agency decided to focus its attention on the relationship between costs and revenues for these mines.

In determining revenues for underground coal mines, we multiplied mine production data (in tons) by the estimated price per ton of the commodity ($16.78 per ton in 2000).[11] The production data were obtained from MSHA's CM441 reports.[12]

Results of the Screening Analysis: Table V-1 shows compliance cost as a percentage of revenue for underground coal mines using our traditional definition of a small mine. Since the proposed rule results in annual net cost savings, there would not be any cost burden placed on small mine operators as defined by MSHA.

TABLE V-1: The Impact of Proposed Rule on the Coal Mining Industry by MSHA Size Categories*

Mine Type	Estimated Net Cost (Savings)	Estimated Revenue	Estimated Net Cost (Savings) per Mine	Costs as % of Revenue
Small (< 20)	$ (775,427)	$ 201,700,466	$ (539)	n.a.
Large (≥ 20)	$ (5,821,834)	$ 5,745,346,385	$ (5,702)	n.a.

*Source: U.S. Department of Labor Mine Safety and Health Administration, Office of Program Evaluation and Information Resources, 2000 data. Average U.S. coal price from Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, Table 80, p.206.

[11] Average U.S. coal price from Department of Energy, Energy Information Administration, *Coal Industry Annual 2000*, January 2002, Table 80, p.206.

[12] Mine Safety and Health Administration's 2000 final CM441 Report, cycle 2000/207.

The Agency used a similar approach to analyze the impact of the proposed rule on small mines as defined by SBA. Table V-2 shows net compliance cost savings as a result of the proposed rule. Therefore, there would not be any cost burden placed on small mine operators as defined by SBA.

TABLE V-2: The Impact of Proposed Rule on the Coal Mining Industry by SBA Size Categories*

Mine Type	Estimated Net Cost (Savings)	Estimated Revenue	Estimated Net Cost (Savings) per Mine	Costs as % of Revenue
Small (≤ 500)	$ (6,342,614)	$ 5,644,194,984	$ (2,587)	n.a.
Large (> 500)	$ (254,647)	$ 302,851,867	$ (36,378)	n.a.

*Source: U.S. Department of Labor Mine Safety and Health Administration, Office of Program Evaluation and Information Resources, 2000 data. Average U.S. coal price from Department of Energy, Energy Information Administration, Coal Industry Annual 2000, January 2002, Table 80, p.206.

Based on the information in Chapter IV of the PREA, the net cost savings of the proposed rule for all coal underground mines with fewer than 20 employees would be $0.8 million yearly; the average cost savings of the proposed rule for a small underground coal mine with fewer than 20 employees would be about $540 per year. The net cost savings of the proposed rule for all underground coal mines with 500 or fewer employees would be about $6.3 million yearly; the average cost savings of the proposed rule for a small coal mine with 500 or fewer employees would be about $2,600 per year.

Given the net cost savings of the proposed rule for small mines, using both our definition and SBA's definition of a small mine, we conclude and certify that compliance with this proposed rule would not impose a significant economic impact on a substantial number of small entities.

As required under the law, we are complying with our obligation to consult with the Chief Counsel for Advocacy on this proposed rule, and on the Agency's certification of no significant economic impact on a substantial number of the mines covered by this rule. Consistent with Agency practice, notes of any meetings with the Chief Counsel's office on this proposed rule, or any written communications, will be placed in the rulemaking record.

Other Relevant Matters. In accordance with the Small Business Regulatory Enforcement Fairness Act (SBREFA), we are taking actions to minimize the compliance burden on small mines. We are committed to writing the proposed rule in plain language, so that it can be easily understood by small mine operators.

VI. THE UNFUNDED MANDATES REFORM ACT OF 1995 AND OTHER REGULATORY CONSIDERATIONS

THE UNFUNDED MANDATES REFORM ACT

MSHA has determined that, for purposes of § 202 of the Unfunded Mandates Reform Act of 1995, this proposed rule does not include any Federal mandate that may result in increased expenditures by State, local, or tribal governments in the aggregate of more than $100 million, or increased expenditures by the private sector of more than $100 million. Moreover, the Agency has determined that for purposes of § 203 of that Act, this proposed rule would not significantly or uniquely affect small governments.

Background

The Unfunded Mandates Reform Act was enacted in 1995. While much of the Act is designed to assist the Congress in determining whether its actions will impose costly new mandates on State, local, and tribal governments, the Act also includes requirements to assist Federal Agencies to make this same determination with respect to regulatory actions.

Analysis

Based on the analysis in this Preliminary Regulatory Economic Analysis (PREA), compliance with this proposed rule by coal mine operators and contractors covered by this rulemaking would result in a net cost saving of approximately $6.6 million per year. Accordingly, there is no need for further analysis under § 202 of the Unfunded Mandates Reform Act.

We have concluded that small governmental entities would not be significantly or uniquely impacted by the proposed regulation. The proposed rule would cover 1,900 underground coal mining operations; however, costs would be incurred only by those mines that elect to implement an alternative method (as prescribed by the proposed rule) to test for methane gas.

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

This proposed rule is not subject to Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights, because it does not involve implementation of a policy with takings implications.

EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM

We have reviewed Executive Order 12988 and determined that this proposed rule would not unduly burden the Federal court system. We drafted the proposed rule to provide a clear legal standard for affected conduct and have asked for public comment to eliminate ambiguities or drafting errors.

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

In accordance with Executive Order 13045, we have evaluated the environmental health and safety effects of the proposed rule on children. The Agency has determined that the proposal would have no adverse effect on children.

EXECUTIVE ORDER 13132: FEDERALISM.

We have reviewed this proposed rule in accordance with Executive Order 13132 regarding federalism and have determined that it does not have "federalism implications." This proposed rule does not "have 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."

EXECUTIVE ORDER 13175: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS.

We certify that the proposed rule would not impose substantial direct compliance costs on Indian tribal governments. Further, we will provide the public, including Indian tribal governments which operate mines, the opportunity to comment during the proposed rule's comment period.

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

In accordance with Executive Order 13211, we have reviewed this proposed rule for its impact on the supply, distribution and use of energy. Because the proposed rule results in yearly net savings of $6.6 million to the coal mining industry, the rule would neither reduce the supply of coal nor increase its price. We conclude, therefore, that the rule would have no significant adverse effect on the supply, distribution, or use of energy.

VII. THE PAPERWORK REDUCTION ACT OF 1995

INTRODUCTION

The purpose of this chapter is to show the burden hours and related costs which would be borne by 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, we estimate costs only in relation to the burden hours that the proposed rule imposes. Therefore, not all costs derived in Chapter IV appear below. Those costs derived in Chapter IV that do not have burden hours related to them do not appear in this chapter.

SUMMARY OF PAPERWORK BURDEN HOURS AND RELATED COSTS

The proposed safety standards for underground coal mine ventilation rule have only one provision (two requirements) that would impose a paperwork burden requirement. The underground coal industry would incur about 312 paperwork burden hours in the first year, which is equivalent to $3,896. Total first year burden hours consist of two components: first year burden hours and annual burden hours. There would be 198 burden hours in the first year with associated costs of $10,770, which is equivalent to $754 of annualized costs (from Table IV-1). Annual burden hours are those that occur every year. Table VII-2 summarizes the annual total paperwork burden hours and total paperwork burden costs. Underground coal mine operators would incur about 114 annual burden hours and associated costs of $3,142.

§ 75.362 (d)(3)(ii) Paperwork Requirement for Filing Field Modification Applications

Before a mine operator can make modification to approved permissible equipment (roof bolter), the mine operator must submit an application to MSHA's Approval and Certification Center. Separate applications are needed for each roof bolter model unless they are of the same type. For example if a mine operator has two roof bolters of the same type, only one application is necessary. We estimate that there would be 67 applications made from mines that employ fewer than 20 workers; 321 applications made from mines that employ 20 to 500 workers; and 7 applications made from mines that employ more than 500 workers. It would take a supervisor, making $54.53 an hour, half an hour to fill out an application. The annualization factor is 0.07. Table VII-1 shows the burden hours and burden costs associated with this section.

Table VII-1: Paperwork Requirement for Filing Field Modification Applications under § 75.362 (d)(3)(ii)

Mine Size	Total # of Field Modification Applications[a]	Total First Year Burden Hours[b]	Total First Year Burden Costs[c]	Total Annualized Costs[d]
Small (< 20)	67	34	$1,827	$128
Large (20-500)	321	160	$8,743	$612
Large (< 500)	7	4	$200	$14
Total	395	198	$10,770	$754

[a] Total # of field modification applications comes from Table IV-4.

[b] Total burden hours = (N x T), where N is the total # of field modification applications; and T is the number of hours it would take for a coal mine supervisor to file a field modification application (T = 0.5 hours).

[c] Total first year burden costs = (B x W_s), where B is the total burden hours, and W_s is the hourly wage rate for underground coal miners (W_s = $54.53).

[d] Total annualized costs = total first year burden costs X 0.07, where 0.07 is the annualization factor.

§ 75.362 (d)(3)(ii) Paperwork Requirement for Maintaining Calibration Record

Section 75.362 (d)(3)(ii) requires mine operators to document each time they perform monthly calibrations on roof bolters. It would take a miner who performs monthly calibration one minute to document it. A total of 67 small underground coal mines (employing fewer than 20 workers) with 67 roof bolters, 295 large underground coal mines (employing 20 to 500 workers) with 481 roof bolters, and 3 large underground coal mines (employing over 500 workers) with 22 roof bolters would need to comply with this requirement. It would take a miner one minute to record the calibration. This has to be done 12 times a year. The hourly wage rate for a coal miner is $27.56. Table VII-2 shows the burden hours and burden costs associated with the above section.

Table VII-2: Paperwork Requirement for Maintaining Calibration Record under § 75.362 (d)(3)(ii)

Mine Size	# of Mines Affected[a]	# of Roof Bolters in Affected Mines[a]	Total Annual Burden Hours[b]	Total Annual Burden Costs[c]
Small (< 20)	67	67	13	$369
Large (20-500)	295	481	96	$2,651
Large (< 500)	3	22	4	$121
Total	365	570	114	$3,142

[a] # of mines affected and # of roof bolters in affected mines come from Table IV-2.

[b] Total annual burden hours = (N x T x 12), where N is the # of roof bolters in affected mines, T is the number of hours it would take for a miner to record the calibration (T = 0.01667 hours, or 1 minute), and 12 is the number of times mine operators would have to perform calibration on roof bolters in a year.

[c] Total annual burden costs = (B x W_m), where B is the total burden hours, and W is the hourly wage rate for underground coal miners (W_m = $27.56).

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