PRELIMINARY REGULATORY ECONOMIC ANALYSIS

FOR

SAFETY STANDARDS REGARDING THE RECOMMENDATIONS OF THE TECHNICAL STUDY PANEL ON THE UTILIZATION OF BELT AIR AND THE COMPOSITION AND FIRE RETARDANT PROPERTIES OF BELT MATERIALS IN UNDERGROUND COAL MINING

PROPOSED RULE

RIN 1219-AB59

U.S. Department of Labor
Mine Safety and Health Administration
Office of Standards, Regulations, and Variances

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I. EXECUTIVE SUMMARY

INTRODUCTION

This Preliminary Regulatory Economic Analysis (PREA) examines the costs and benefits of MSHA's proposed rule on the Recommendations of the Technical Study Panel on the Utilization of Belt Air and the Composition and Fire Retardant Properties of Belt Materials in Underground Coal Mining. This proposal includes requirements for improved flame-resistant conveyor belts, fire prevention and detection, and approval of the use of air from the belt entry to ventilate the working sections for underground coal mines. The proposed rule implements Section 11 of the Mine Improvement and New Emergency Response Act of 2006 (MINER Act).

MINE SECTOR AFFECTED

The proposed rule applies to all underground coal mines in the United States. Based on the most recent MSHA data, there were 624 underground coal mines, employing 42,207 miners, operating in the U.S. in 2007.

BENEFITS

MSHA has qualitatively evaluated the potential benefits of the proposed rule. From 1980 to 2007, there were 65 reportable conveyor belt entry fires. These fires caused more than two dozen injuries and three deaths. The proposed provisions on improved flame-resistant conveyor belt would reduce conveyor belt fires in underground coal mines and would prevent related fatalities and injuries. The proposed provisions on fire prevention and detection and for approval of the use of air from the belt entry to ventilate the working sections would improve miner safety in underground coal mines in several ways by requiring: the use of carbon monoxide sensors for fire detection along belt conveyors; improved belt conveyor and belt conveyor entry maintenance; AMS operator qualification and training; a reduced concentration of methane in the belt entry where air from the belt entry is used to ventilate the working section; a higher ventilating pressure in the primary escapeway than the belt entry; and lifelines marked with standardized tactile signals to aid miners evacuating the mine where visibility is obscured by smoke.

COMPLIANCE COST

MSHA estimates the total yearly costs of the proposed rule to be $51.7 million for underground mine operators and $90,000 for conveyor belt manufacturers.

REGULATORY FLEXIBILITY CERTIFICATION AND ANALYSIS

In accordance with § 605 of the Regulatory Flexibility Act, 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 Regulatory Flexibility Act, MSHA 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. The analysis that

provides the factual basis for this certification is discussed in the Regulatory Flexibility Certification section of this PREA and in the preamble to the proposed rule. 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. These data are from the U.S. Department of Labor, Mine Safety and Health Administration, Office of Program Evaluation and Information Resources (PEIR), 2007 data as of February 5, 2008. MSHA estimated the value of coal output of the U.S. underground coal mining sector to be $14.1 billion in 2007.

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 mines. Each sector is further divided by type of operation, either underground mines or surface mines. The Agency collects data on the number of mines and on mining employment by mine type and size. MSHA also collects data on the number of independent contractors.

STRUCTURE OF THE COAL MINING INDUSTRY

Table II-1 presents data on underground coal mines, by employment size, excluding contractors. Agency data in Table II-1 indicate that there were 624 underground coal mines that reported employment during some portion of calendar year 2007, eleven of which were idled. Total employment at underground coal mines in 2007 was approximately 43,500 (42,200 miners and 1,300 office employees). There were approximately 37,800 miners working underground and 4,400 miners employed on the surface.

Table II-1: Underground Coal Mines (Excluding Contractors) by Employment Size, 2007

Size of Mine	Number of Mines	Number of Miners	Office Employment	Number of Mines with Miners Underground	Number of Miners Working Underground
1-19 Employees	223	2,300	100	212	1,900
20-500 Employees	391	33,500	1,000	391	30,300
501+ Employees	10	6,400	200	10	5,600
All Underground Coal Mines	624	42,200	1,300	613	37,800

Table II-2 presents data on independent contractors who worked in underground coal mines in 2007. There were approximately 5,100 contractors working underground.

Table II-2: Underground Coal Contractors
by Employment Size, 2007

Size of Contractor	Number of Firms	Non-Office Employment	Office Employment	Non-Office Employment Working Underground
1-19 Employees	211	1,300	100	600
20-500 Employees	96	7,900	150	4,500
501+ Employees	0	0	0	0
All Underground Coal Contractors	307	9,200	250	5,100

ECONOMIC CHARACTERISTICS OF THE COAL MINING INDUSTRY

MSHA classifies the U.S. coal mining sector into three major commodity groups: bituminous, lignite, and anthracite. 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 5 percent of all coal miners, and account for 7 percent of total coal production. Anthracite operations represent approximately 8 percent of coal mining operations, employ 1 percent of all coal miners, and account for 0.1 percent of total coal production.

The U.S. underground coal sector produced an estimated 349 million tons of coal in 2007 at an average price of $40.37 per ton.

III. BENEFITS

The proposed rule implements Section 11 of the MINER Act. MSHA has qualitatively evaluated the potential safety benefits of the proposed rule. Benefits are separately discussed below, first, for proposed provisions on improved flame-resistant conveyor belts and, second, for proposed provisions on fire prevention and detection and approval of the use of air from the belt entry to ventilate the working sections.

BENEFITS OF PROPOSED PROVISIONS ON IMPROVED FLAME-RESISTANT CONVEYOR BELTS

The proposed provisions on improved flame-resistant conveyor belts would reduce belt entry fires in underground coal mines and would prevent related fatalities and injuries. From 1980 to 2007, there were 65 reportable belt entry fires. Almost all involved the conveyor belt itself. These fires caused over two dozen injuries and three deaths -- one in 1986 at the Florence No. 1 Mine, and two in 2006 at the Aracoma Alma No. 1 Mine. The Technical Study Panel (Panel) noted that the number of belt fires had decreased over the past decade, but that the rate (i.e., number of fires per thousand mines) has remained constant. The Panel also noted that during this same period, although underground coal production increased so that the number of belt fires per 100 million tons decreased, there was high variability from year to year. These proposed provisions would prevent conveyor belt fires and, in turn, reduce accidents, injuries, and deaths caused by conveyor belt fires.

Fire Hazards of Conveyor Belts

Nearly all underground coal mines use conveyor belts to transport coal. Conveyor belt entries contain large amounts of combustible materials including the conveyor belt itself, coal and coal dust, grease and oil, and roof and rib supports. The major ignition sources for conveyor belt fires are frictional heating at the belt drive or along the belt, electrical equipment, hot rollers or bearings, and cutting and welding equipment. The conveyor belt is the principal fuel for flame propagation in the conveyor entry because it acts as a continuous filament of combustible material extending the length of the mine entry. Tests show that the conveyor belt ignites much more easily than either the coal in place or the wood used for timber, lagging, or other construction.

The intensity of a conveyor belt fire can build quickly and become lethal. A conveyor belt that has poor flame resistance will spread flames along the exposed surfaces of the belt and eventually ignite other combustibles such as the coal. When conveyor belt fires reach the propagation state, they produce more fire gases and spread faster than the fires of surrounding coal surfaces. As the conveyor belt fire progresses and extends to other combustibles, the concentrations of toxic gases increase to potentially lethal levels. The mine ventilation system can be disrupted due to the spreading conveyor belt fire. The disruption of air flow through the mine can introduce a threat of explosion from the accumulation of methane and the release of flammable gases.

Once started, a conveyor belt fire can jeopardize the lives of persons working in the mines and participating in rescue and recovery work. The most common hazards of conveyor belt fires are: (1) heat from the fire and the toxic effects of fumes, such as carbon monoxide,

encountered by persons near the fire or in distant inby areas of the mine; (2) smoke, which obscures vision and disorients miners attempting to evacuate the mine; (3) roof falls that occur while the fire is being fought or the affected area or mine is being sealed; and (4) ignition and/or explosion of a flammable gas or coal dust atmosphere.

Description of Specific Conveyor Belt Fires

To illustrate the potential impact of a conveyor belt fire, MSHA describes below four belt entry fires out of the 65 that have occurred since 1980: Aracoma Alma Mine No. 1, Marianna Mine, Florence No. 1 Mine, and Beatrice Mine.

Aracoma Alma Mine No. 1

On January 19, 2006, a fire occurred in the Aracoma Alma Mine No. 1, in Logan County, West Virginia. According to the MSHA Investigation Report, the fire occurred as a result of frictional heating when the longwall conveyor belt became misaligned.[1] This frictional heating ignited accumulated coal dust, grease, oil, belt shavings, and other combustible materials. Twenty-nine miners were working in the mine at the time. Two of the twelve miners on one crew became separated from the remainder of the crew as they were evacuating the mine. The two miners died as a result of the fire. All the other miners escaped safely.

MSHA conducted an evaluation of the flame resistance of samples of two different conveyor belts recovered from the Aracoma Alma Mine No. 1 fire using the existing flame test and the proposed Belt Evaluation Laboratory Test (BELT) method. Both samples from the two different conveyor belts passed the existing flame test, but failed the proposed BELT method.

Marianna Mine

On March 7, 1988, a fire started at a belt drive in the Marianna Mine in Washington County, Pennsylvania. The MSHA report of the fire indicated that loose coal probably spilled onto the lower belt and accumulated in the drive rollers, where it was ground into coal dust.[2] This, in turn, caused belt slippage and frictional heating, which ignited the coal and the belt. The fire quickly propagated down the belt, ignited other combustibles, and totally engulfed parts of the belt entry. Eventually it burned over the top of a stopping to the track entry, where it ignited roof coal, cribs, and guard boards.

Miners at the five working sections of the mine were evacuated within 90 minutes of the discovery of the fire, but five miners were sent to a hospital for treatment of smoke inhalation.

Florence No. 1 Mine

On November 27, 1986, at about 2:00 a.m., a conveyor belt fire occurred at the Florence No. 1 Mine, Indiana County, Pennsylvania. Two section foremen and one pumper were present at the mine. According to the MSHA Investigation Report, the fire was caused by the accumulation of coal dust and a defective bottom roller on the tight side of the belt

[1] U.S. Department of Labor, Mine Safety and Health Administration, 2007, p. 2.

[2] U.S. Department of Labor, Mine Safety and Health Administration, 1990, pp. 18-19.

entry.[3] The two section foremen discovered the fire. After fighting the fire for some time, the two section foremen left the mine and were taken to a hospital where they were treated for smoke inhalation. The pumper returned to the fire with the mine foreman and a general assistant who had arrived at the mine. During the firefighting activities, the mine foreman suffered a fatal heart attack.

The belt continued to burn until the fire reached the belt drive, a distance of about 1,200 feet. The fire suppression system at the belt drive activated automatically and extinguished the fire.

Beatrice Mine

On November 25, 1981, a conveyor belt fire occurred on the longwall panel in Beatrice Mine, Buchanan County, Virginia. MSHA investigators determined that the fire originated at the dolly car, a part of the belt take-up that serves as a belt storage system.[4] A small flame ignited coal dust, loose coal spillage, grease, and other combustible materials, which, in turn, ignited the belt. Approximately 2,000 feet of belt burned.

BENEFITS OF PROPOSED PROVISIONS ON FIRE PREVENTION AND DETECTION AND APPROVAL OF THE USE OF AIR FROM THE BELT ENTRY TO VENTILATE THE WORKING SECTIONS

The proposed provisions on fire prevention and detection and approval of the use of air from the belt entry in underground coal mines would improve miner safety. The provision addressing maintenance of the belt conveyor and belt conveyor entry would improve safety to miners by requiring specific hazards to be corrected when found. These hazards, known to be sources of belt fire ignitions, include damaged and missing rollers and belt misalignment. For example, the MSHA Investigation Report of the Aracoma Alma Mine # 1 fire determined that the fire occurred as a result of the frictional heating due to a misaligned belt.[5] The provision would also require that damaged components removed from service and other non-combustibles be removed from the belt entry. These non-combustibles are tripping hazards and potential sources of frictional heating that could lead to fire.

The proposed requirement to replace point-type heat sensors with carbon monoxide sensors for fire detection along belt conveyors in all underground coal mines would enhance miner safety because carbon monoxide sensors provide earlier fire detection. Earlier fire detection allows miners to better address the problem and/or evacuate the area. MSHA's research and accident investigation reports indicate that carbon monoxide sensors are superior to point-type heat sensors. For example, in the 1992 Dilworth mine fire, the point-type heat sensors were no more than 27 feet away, but the carbon monoxide sensor that actually detected the fire was 1,400 feet downwind of the fire. Based on MSHA's research and experience, replacing point-type heat sensors with carbon monoxide sensors is an improvement in early fire warning detection and an enhancement in miner safety.

[3] U.S. Department of Labor, Mine Safety and Health Administration, 1987.

[4] U.S. Department of Labor, Mine Safety and Health Administration, 1982.

[5] U.S. Department of Labor, Mine Safety and Health Administration, 2007, p. 2.

Inadequate Atmospheric Monitoring System (AMS) operator training was identified as a contributing factor in the two fatalities in the Aracoma fire. Accident investigators found all miners assigned the duties of an AMS operator at this mine needed additional training to properly respond to alert, alarm, and malfunction signals generated by the AMS. The proposed provisions for AMS operator qualification and training would improve safety for miners by assuring that AMS operators have the knowledge to respond properly to AMS signals. The qualification of miners as AMS operators would assure that MSHA has oversight in the development and approval of the task training, and annual retraining requirements would assure that AMS operators retain knowledge and training needed to perform specific duties and responsibilities. Specified training requirements would also assure that AMS operators are familiar with underground mining systems such as coal haulage, transportation, ventilation, and escape facilities.

Methane ignitions and explosions in the face areas can cause serious injuries or death to miners. The proposed provision requiring a reduced concentration of methane in the belt entry would improve safety for miners working on sections where air from the belt entry is used to ventilate the working section. This reduced methane standard would provide a greater methane dilution capacity in face areas, reducing the risk of a methane ignition or explosion at the face.

The proposed provision requiring a higher ventilating pressure in the primary escapeway than the belt entry would assure that air leakage moves from this escapeway to the belt entry. If a fire were to occur in the belt entry, the primary escapeway would not become contaminated with smoke and carbon monoxide, thus maintaining the integrity of the escapeway and providing a safe means of egress for miners.

The proposed provision requiring lifelines to be marked with standardized tactile signals would aid miners evacuating the mine where visibility is obscured by smoke. New standardized signals would be required to: identify impediments to travel within the escapeway; identify the location of personnel doors in adjacent crosscuts connected to adjacent escapeways; and identify the location of refuge alternatives. Existing signals for direction of travel and SCSR storage locations would also be standardized. Standardization of these signals would allow for consistent understanding of the signals so that miners who transfer between mines will not need to learn new signal systems, and generally would reduce the possibility of confusion, delay, or injury in an emergency.

CONCLUSION

From 1980 through 2007, 65 reportable fires in the belt entry of underground coal mines claimed the lives of three miners, injured more than two dozen miners, and come perilously close to claiming the lives of entire sections of miners. Conveyor belt fires have also caused extensive property damage that resulted substantial rehabilitation costs, lost production, and lost revenue.

The proposed rule would reduce the risk of conveyor belt fires. The provisions for improved flame-resistance of conveyor belts would significantly reduce the ease of ignition and flame propagation of a conveyor belt. The provisions for replacement of point-type heat sensors with carbon monoxide sensors would provide earlier fire detection and warning. As previously described, other provisions of the proposed rule would also enhance miner safety.

IV. COST OF COMPLIANCE

MSHA analyzes the cost of the proposed rule in three parts. Part A summarizes the total cost, part B estimates the cost of the proposed requirements for improved flame resistance of conveyor belts, and part C estimates the cost of proposed requirements for fire protection and detection and approval of the use of air from the belt entry to ventilate working sections.

MSHA has estimated the costs of the proposed rule based on the Agency's knowledge, experience, and available information. In some cases, the estimates may appear to deviate slightly from the sum or product of the components due to rounding.

MSHA solicits comments on all its cost estimates and on the data and assumptions the Agency used. In your response, please be specific as to suggested alternatives to MSHA's data and assumptions. Where possible, please include specific support for your comments.

PART A: SUMMARY OF TOTAL COST OF PROPOSED RULE

MSHA estimates the total yearly costs of the proposed rule to be $51.7 million for underground mine operators and $90,000 for conveyor belt manufacturers.

The total yearly cost of the proposed rule includes the amortized value of the first-year costs. The first-year cost (starting in the second year) for improved flame resistance of conveyor belts is approximately $44 million. The first-year cost (starting in the first year) for fire protection and detection and approval of the use of air from the belt entry to ventilate working sections is approximately $22 million. Combining these two costs, the total first-year cost is approximately $66 million for the proposed rule.

Table IV-1 presents MSHA's estimate of the total yearly costs of the proposed rule, by mine size, and by major provision of the proposed rule. Estimated yearly costs are: mines with 1-19 employees, $4.8 million; mines with 20-500 employees, $42.8 million; and mines with 501+ employees, $4.1 million. MSHA estimates that the yearly cost to mine operators for smoke sensors as $460,000; however, MSHA has not included this cost in its total estimate since approved smoke sensors are not available for use in underground coal mines.

Table IV-1. Summary of Yearly Costs,
by Mine Size and by Cost Category

Cost Category	1-19 Employees	20-500 Employees	501+ Employees	TOTAL
Improved Flame Resistant Belt	$3.3 million	$33.4 million	$3.8 million	$40.4 million
Improved Flame Resistant Belt (Manufacturers)	n/a	n/a	n/a	$90,000
Carbon Monoxide Sensors	$670,000	$5.5 million	$180,000	$6.3 million
Maintenance of Belts and Belt Entries	$750,000	$2.6 million	$130,000	$3.5 million
AMS Operator Duties	$57,000	$960,000	$29,000	$1.0 million
Lifeline Signals	$39,000	$290,000	$15,000	$340,000
Other Provisions*	$1,300	$63,000	$3,700	$68,000
TOTAL	$4.8 million	$42.8 million	$4.1 million	$51.8 million

*Other provisions include installing air locks on personnel doors along escapeways where static pressure exceeds 125 pounds and, in mines using air from the belt entry to ventilate working sections, installing extra carbon monoxide sensor and alarm unit on point-feeds, and installing means to remotely close point-feeds.

Table IV-2 shows the estimated average yearly cost of the proposed rule per underground coal mine, by mine size.

Table IV-2. Average Yearly Cost* per Mine, by Mine Size

Mine Size	Yearly Cost of Proposed Rule	Number of Mines	Yearly Cost per Mine
1-19 employees	$4.8 million	223	$21,000
20-500 employees	$42.8 million	391	$110,000
501+ employees	$4.1 million	10	$410,000
All Mines	$51.7 million	624	$83,000

*Excludes belt manufacturer costs.

Methodology

For the proposed rule, MSHA estimated the following costs: (1) one-time or intermittent costs; (2) annual costs; and (3) annualized costs. One-time costs are those that are incurred only once, usually in the first year of compliance. Intermittent costs are those

costs that may recur from time to time, but not annually. Capital expenditures, such as equipment costs, 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 or intermittent costs that are amortized over the life of the investment using a specified interest (or discount) rate to produce an equivalent constant stream of costs.

For this PREA, the Agency used a (real) discount rate of 7 percent, as recommended by the Office of Management and Budget (OMB) using the annualization formula:

$$a = (i + d) / (1 + i),$$

where "a" is the annualization factor, "i" is the annual discount rate, and "d" is the depreciation rate of the non-annual recurring investment. Yearly costs are the sum of annual costs and annualized costs.

MSHA used two depreciation rates in this PREA. The first is 20 percent per year, to reflect a five-year life, for carbon monoxide sensors and related hardware. Under the 7 percent discount rate and 20 percent depreciation rate, $100 of initial cost amounts to a perpetual yearly cost of $25.23. The second depreciation rate is 10 percent per year, to reflect a ten-year life, for the coal mines. Under the 7 percent discount rate and 10 percent depreciation rate, $100 of initial cost amounts to a perpetual yearly cost of $15.89.

MSHA used hourly compensation rates of $26.37 for a clerical worker, $33.70 for a miner, $85.14 for a supervisor, and $50.00 for a mine engineer.[6] For convenience, MSHA will refer to these hourly compensation rates as "wages," where that term is understood to include benefits such as social security, unemployment insurance, and workers' compensation, but not shift differentials or overtime pay. These wages and all other costs are reported in 2007 dollars.

PART B: COST FOR IMPROVED FLAME RESISTANCE OF CONVEYOR BELTS

Proposed § 75.1108 would require that, effective one year after publication of the final rule, all conveyor belts purchased for use in underground coal mines be approved by MSHA as flame resistant under 30 CFR part 14. Part B of this chapter addresses the cost for underground coal mine operators and the cost for manufacturers of conveyor belt. MSHA solicits comments on whether conveyor belt manufacturers would sustain losses from excess inventory of existing conveyor belt when the part 14 requirements take effect one year after the effective date of the rule.

Cost of Compliance for Underground Coal Mine Operators

MSHA determined the costs of proposed § 75.1108 by estimating incremental costs of underground conveyor belts under the existing versus under the proposed rules. To

[6]Data derived from Jennifer B. Leinart and Krista L. Salzer, compilers, *U.S. Coal Mine Salaries, Wages, and Benefits: 2006 Survey Results*, Spokane Valley, Washington: InfoMine USA, Inc., 2007.

estimate baseline costs under the existing rule, MSHA first developed estimates of existing belt use and replacement.

Conveyor belts vary in width, thickness, strength, and length. To develop its cost estimate, MSHA separated belts into three categories by width: (1) belts less than 48 inches (narrow belts); (2) belts 48 inches or wider, but less than 72 inches (medium belts); and (3) belts 72 inches or more (wide belts). Narrow belts are generally used on the section and, for many small mines, on the main line. Medium belts are used as section belts at larger mines and on the main line at both small and large mines. Wide belts are generally used on the main line of large longwall mines.

Based on 2008 MSHA data, there are approximately 2,300 miles, or 24.5 million linear feet, of conveyor belt in underground coal mines. Of this total, approximately 12.0 million feet are narrow belt, 10.1 million feet are medium belt, and 2.5 million feet are wide belt. Approximately 2.2 million feet are in mines with 1-19 employees, 20.3 million feet are in mines with 20-500 employees, and 2.0 million feet are in mines with 501+ employees. Approximately 14.7 million feet are in the main lines and 9.8 million feet are in the sections. Table IV-3 provides details.

Table IV-3. Length of Conveyor Belt in Underground Coal Mines in Feet By Mine Size, Belt Width, and Location

All Conveyor Belts				
	Mine Size			
Belt Width	1-19	20-500	501+	All Mines
Less Than 48"	2.2 million	9.7 million	0.1 million	12.0 million
48" to 66"	0	8.6 million	1.4 million	10.1 million
72" or Wider	0	2.0 million	0.5 million	2.5 million
Total	2.2 million	20.3 million	2.0 million	24.5 million

Belts on Main Lines				
	Mine Size			
Belt Width	1-19	20-500	501+	All Mines
Less Than 48”	1.1 million	1.6 million	0	2.7 million
48” to 66”	0	8.6 million	0.9 million	9.5 million
72” or Wider	0	2.0 million	0.5 million	2.5 million
Total	1.1 million	12.2 million	1.4 million	14.7 million

Belts on Sections				
	Mine Size			
Belt Width	1-19	20-500	501+	All Mines
Less Than 48"	1.1 million	8.1 million	0.1 million	9.3 million
48" to 66"	0	0	0.5 million	0.5 million
72" or Wider	0	0	0	0
Total	1.1 million	8.1 million	0.6 million	9.8 million

MSHA estimated an average price per linear foot for existing belt of $34 for narrow belts, $44 for medium width belts, and $64 for wide belts. MSHA estimated that the price for new belts would be 35 percent higher than the price of existing belt. The estimated average price per linear foot for new belt would be $46 for narrow belts, $60 for medium width belts, and $86 for wide belts. MSHA used information from belt manufacturers to develop these cost estimates.

MSHA assumed that belts that passing the proposed Belt Evaluation Laboratory Test (BELT) method would have the same service life as existing belts. MSHA estimated the average service life of belts to be 10 years for belts used on the main lines and 6 years for belts used on the sections. Therefore, 10 percent of belts on the main lines, or 1.5 million linear feet, and 17 percent of belts on the sections, or 1.6 million linear feet, are replaced each year. In total, 3.1 million linear feet of belt are replaced each year.

The cost of replacing 3.1 million linear feet of belt each year is approximately $123.5 million under the existing rule. The cost of replacing 3.1 million linear feet of belt under the proposed rule would be approximately $166.7 million. The incremental cost of replacing this belt with new belt approved under part 14 would therefore be approximately $43.2 million each year.

In developing this estimate, MSHA divided total conveyor belt length for each belt width by the belt service life, and applied the appropriate cost increase between existing belt and belt under the proposed rule. The details of this derivation are discussed below.

The annual replacement of narrow belts is estimated as 2.7 million linear feet on the main lines divided by 10, plus 9.3 million linear feet on the sections divided by 6, for a total of 1.8 million linear feet of narrow belts replaced each year. The increased cost for narrow belts under the proposed rule would be $12 per linear foot ($46 minus $34) multiplied by 1.8 million linear feet of narrow belt replaced per year, for an incremental cost to replace narrow belt of $21.5 million per year.

The annual replacement of medium belts is estimated as 9.5 million linear feet on the main lines divided by 10, plus 540,000 linear feet on the sections divided by 6, for a total of 1.0 million linear feet of medium belts replaced each year. The increased cost for medium belts under the proposed rule would be $16 per linear foot ($60 minus $44) multiplied by 1.0 million linear feet of medium belt replaced per year, for an incremental cost to replace medium belt of $16.2 million per year.

The annual replacement of wide belts is estimated as 2.5 million linear feet on the main lines divided by 10, for a total of 250,000 linear feet of wide belts replaced each year. The increased cost for wide belts under the proposed rule would be $22 per linear foot ($86

minus $64) multiplied by 250,000 linear feet of wide belt replaced per year, for an incremental cost to replace wide belt of $5.5 million per year.

The total incremental yearly cost of replacing existing belt with belt approved under part 14 would be the sum of $21.5 million for narrow belt, $16.2 million for medium belt, and $5.5 million for wide belt, or approximately $43.2 million per year. Because the requirement to use flame-resistant belt would take effect one year after publication of the final rule, this annual cost is annualized using a 7 percent discount rate to obtain the yearly cost of approximately $40.4 million.

Costs of Compliance for Conveyor Belt Manufacturers

Part 14 of the proposed rule contains requirements for the Belt Evaluation Laboratory Test (BELT) that MSHA would use to approve a flame-resistant conveyor belt.

The costs of proposed part 14 are separated into three categories: first-year costs, second-year costs, and annual costs beginning the third year. No capital costs are estimated to be incurred; manufacturers are expected to be able to use existing equipment and facilities to formulate and construct belts that meet the proposed part 14 flame test.

The costs to conveyor belt manufacturers would include costs for application fees, materials, and labor. MSHA's testing and evaluation fees for applications are those published in the *Federal Register*. Labor costs for professional and technical personnel are based on estimated costs to the manufacturers. The average fringe benefits are estimated to be 42 percent of average wages and salaries.

The estimated cost to belt manufacturers of proposed part 14 is $770,000 for the first year, $62,000 for the second year, and $40,000 for the third year and each succeeding year. The estimated annualized yearly cost of proposed part 14 is $90,000. The derivation of these part 14 costs for belt manufacturers is presented below.

§ 14.4 Application Procedures and Requirements

This section specifies the procedures an applicant must follow to apply for approval of a conveyor belt under the proposed rule. There are several direct and indirect costs associated with this section. These are: (1) research and development costs to produce belts that are expected to pass the proposed flame test; (2) costs to prepare the applications; and (3) fees imposed by MSHA for testing and evaluation. These costs are discussed separately.

Research and Development Costs

Conveyor belts under proposed part 14 would, in many cases, consist of formulations of polyvinyl chloride (PVC) or rubber different from those used in the belts under existing § 18.65. Research and development costs would be incurred by the manufacturers as they formulate conveyor belt that will pass the proposed flame test. Some conveyor belts that manufacturers currently sell for use in underground coal mines, especially internationally, would pass the proposed flame test, but others would not.

MSHA expects that research and development costs for a manufacturer could vary, ranging from a modest cost to more than $125,000, if the conveyor belts would need major reformulations. MSHA estimates that, on average, there would be an initial $65,000 cost per

manufacturer to conduct the research and development to formulate conveyor belts that will pass the proposed flame test. This amount reflects the salaries and benefits of professional and technical personnel who would formulate the belts; the raw materials to produce a sufficient sample for the manufacturer's own testing; and the costs, including labor, of producing that sample. It also includes the costs of formulating some belts that would be considered unacceptable by the manufacturer.

The research and development costs are expected to occur only during the first year. After that time, MSHA assumes that belt manufacturers would be sufficiently familiar with the formulations to develop belt that would pass the proposed flame test and would not incur additional research and development expenses. MSHA estimates that 10 conveyer belt manufacturers would submit approval applications under the proposal. MSHA therefore estimates the research and development costs for the first year would be $650,000 ($65,000 per applicant x 10 applicants).

Costs to Prepare the Applications

The proposal would require that an application for approval include technical information about the construction of the belt, such as the type of compound used in the covers, the thickness of top and bottom covers, the carcass construction, and the type of fabric used. In addition, formulation information on the compounds in the belt would be specified in the application. Finally, the name, address, and telephone number of the applicant's representative responsible for answering questions about the application would also be provided. Less information would be submitted for extensions of approvals or for approvals of conveyor belts similar to previously-approved belts.

MSHA estimates that an application for an original approval of a conveyor belt would take 5 hours to prepare, while an application for an approval of a similar belt or for an extension of approval would take 2 hours to prepare. MSHA expects that an engineer, compensated at $50 per hour, would prepare the applications. The labor cost to prepare an original application for approval of belt, therefore, would be $250. The labor cost to prepare an application for approval of a belt similar to a previously-approved belt or an extension of approval would be $100.

The number of new applications for approval under the proposed rule is expected to be substantially greater during the first few years, as manufacturers seek approval for new belt constructions. During the first year, MSHA estimates that applicants would submit 120 conveyor belts for testing. Of these 120 belts, MSHA estimates that 100 would be for original approvals of conveyor belt (at a cost of $250 each or $25,000), while the remaining 20 would be for approvals of belts either similar to those that had already been approved or for extensions of approval (at a cost of $100 each or $2,000), for a total cost in the first year of $27,000.

During the second year, MSHA estimates that applicants would submit 60 conveyor belts for testing. Of these 60 belts, MSHA estimates that 50 would be for original approvals (at a cost of $250 each or $12,500), while the remaining 10 would be for approvals of belts either similar to those that had already been approved or for extensions of approval (at a cost of $100 each or $1,000), for a total cost in the second year of $13,500.

During the third and following years, MSHA estimates that applicants would submit 40 conveyor belts for testing. Of these 40 belts, MSHA estimates that 30 would be for original approvals (at a cost of $250 each or $7,500), while the remaining 10 would be for approvals of belts either similar to those that had already been approved or for extensions of approval (at a cost of $100 each or $1,000), for a total cost in the third and each succeeding year of $8,500.

Proposed § 14.4(d) would permit MSHA to request additional information from the applicant. The above cost estimates include possible requests from MSHA for additional information.

The total cost to prepare the approval applications would be approximately $27,000 the first year, $13,500 the second year, and $8,500 the third year and each succeeding year.

Cost of Application Testing and Evaluation Fees

In addition to the research and development costs and the costs to prepare belt approval applications, belt manufacturers would incur costs under MSHA's testing and evaluation fees. The existing fee for testing and evaluation is $84 per hour.[7]

MSHA's Approval and Certification Center estimates that the proposed flame test would take an average of 3 hours to conduct, an average of 1 hour for each of the three samples that would be tested. On some occasions, a belt test may take more time. If the belt has very poor flame-resistant properties and the samples create a conflagration, then the time required between tests and the clean-up and setup time would significantly increase, possibly approaching six hours.

MSHA's Approval and Certification Center estimates that evaluation of the application for an original approval would take approximately 4 hours. The estimated time needed to evaluate an application for an approval of a similar belt or an extension of approval would be 3 hours.

The total cost for an original application for approval of conveyor belt would be $588, which includes three hours for testing and four hours for evaluation ($84 per hour x 7 hours).

For an application for an approval of a similar belt or an extension of approval that requires testing, the total cost would be $504, which includes three hours for testing and three hours for evaluation ($84 per hour x 6 hours). An application for an approval of a similar belt or an extension of approval might not require testing, but the application would have to be evaluated. For example, if a manufacturer submits a 4-ply belt that is identical, except in number of plies, to previously approved belts with 2, 3, and 5 plies, MSHA would likely grant an extension of approval to the 4-ply belt without additional testing. The estimated cost of evaluation for an application that does not require testing would be $252 ($84 per hour x 3 hours). MSHA estimates that one-half of the applications for an approval of a similar belt or an extension of approval would require testing, and one-half would not require testing. The

[7] "Fee Adjustments for Testing, Evaluation, and Approval of Mining Products," *Federal Register*, December 27, 2007, vol. 72, no. 247, pp. 73380-81.

average cost for an application for approval of similar conveyor belt or extension of approval would be $378 (the average of $504 and $252).

In the first year, MSHA estimates that there would be 100 original applications ($588 each) and 20 applications for approval of similar conveyor belt or extension of approval ($378 each) for a total cost of approximately $66,000. In the second year, there would be 50 original applications ($588 each) and 10 applications for approval of similar conveyor belt or extension of approval ($378 each) for a total cost of approximately $33,000. In the third year, there would be 30 original applications ($588 each) and 10 applications for approval of similar conveyor belt or extension of approval ($378 each) for a total cost of approximately $21,000.

Proposed § 14.4(d) would permit MSHA to require additional testing, samples, or material from the applicant. MSHA estimates that additional testing would be required for 10 percent of the applications. Accordingly, MSHA has added 10 percent to the above testing and evaluation costs for test samples. The total costs for testing and evaluation would therefore be increased from $66,000 to $73,000 the first year, from $33,000 to $36,000 the second year, and from $21,000 to approximately$24,000 the third year and each succeeding year.

§ 14.5 Test Samples

Proposed § 14.5 would require, upon request by MSHA, that applicants submit three 5-foot by 9-inch samples for testing. The minimum width belting used in underground coal mines is generally 36 inches. Therefore, 5 feet of belt (which can be divided into three 9-inch wide pieces), at an estimated average cost of $25 per foot, would be required. MSHA estimates that the material cost would be $125 and the shipping cost would be $60, for a total of $185 for each conveyer belt tested.

MSHA anticipates that applicants would submit three samples for each application. Since all applications for original approvals would require testing and approximately one-half of the applications for approval of similar conveyor belt and extensions of approvals would require testing, this would be 110 sets of three samples during the first year at a total cost of approximately $20,000; 55 sets during the second year at a total cost of approximately $10,000; and 35 sets during the third and following years at a total cost per year of approximately $6,500.

Proposed § 14.4(d) would permit MSHA to require additional testing, samples, or material from the applicant. MSHA estimates that additional samples would be required for 10 percent of the applications. Accordingly, MSHA has added 10 percent to the above materials and shipping costs. The total costs for materials and shipping of test samples for approvals, therefore, would be increased from $20,000 to approximately $22,000 the first year, from $10,000 to approximately $11,000 the second year, and from $6,500 to approximately $7,000 the third year and each succeeding year.

§ 14.7 Approval Marking and Distribution Records

Proposed § 14.7(b) would require that approved conveyor belt be marked with the assigned MSHA approval number at intervals not to exceed 60 feet and repeated at least once every foot across the width of the belt. Proposed § 14.7(d) would require applicants granted

approval to maintain records of the initial sale of each belt having an approval marking and to retain the record for at least five years following the initial sale. MSHA estimates that marking approved conveyor belt would not impose additional cost because accepted conveyor belt must be marked under the existing rule. MSHS estimates that maintaining records of initial sales is a normal business practice and would have a negligible cost.

§ 14.8 Quality Assurance

Proposed § 14.8 would require that applicants granted an approval to manufacture conveyor belts flame test a sample of conveyor belt or inspect and test certain materials that contribute to its flame resistance. They would also be required to calibrate instruments, control production, and notify MSHA immediately when belt has been distributed that does not meet the specifications of the approval. This notification would need to include a description of the nature and extent of the problem, the locations where the conveyer belt has been distributed, and the approval-holder's plan for corrective action, such as recalling the belt.

Based on MSHA's experience, belt manufacturers already have sophisticated quality assurance programs in effect. These quality assurance programs include testing of batches, lots, or slabs for various characteristics, such as flame resistance, adhesion, strength, and abrasion resistance. MSHA also expects that the instruments used for these tests are calibrated according to the instrument manufacturers' specifications, using nationally or internationally recognized standards, which are requirements of the proposed rule. A conveyor belt is marked with a manufacturer's code or a production date that can be used to identify the belt as coming from a particular run or batch. Manufacturers and their distributors keep records of the customers for that run, so as to be able to identify the mine operators that have purchased a particular belt. MSHA therefore has estimated no additional costs for these proposed requirements.

MSHA believes that distribution of belts that do not meet approval specifications would be rare. MSHA estimates that the incremental cost of complying with these provisions would be negligible.

§ 14.10 Post-Approval Product Audit

Under proposed § 14.10, approved conveyor belts would be subject to periodic audits by MSHA. An approval holder, at MSHA's request, would have to make three samples of an approved conveyor belt available for audit, at no cost to MSHA, not more than once a year. In addition, MSHA could audit a manufacturer, for cause, at any time if the Agency believes that the belt is not in compliance with the rule. MSHA estimates that these audits would be rare.

MSHA estimates that 6 belts (18 samples) would be submitted for audit each year, starting with the second year (twelve months after approval). These audits would be necessary to confirm that the belt is being manufactured according to approval requirements. MSHA estimates that the material cost would be $125 and the shipping cost would be $60, for a total of $185 for each conveyer belt audited.

The total costs for materials and shipping of test samples for 6 audits, at a cost of $185 each, therefore would be approximately $1,100 in the second year and in each subsequent year.

PART C: FIRE PROTECTION AND DETECTION AND APPROVAL OF THE USE OF AIR FROM THE BELT ENTRY IN UNDERGROUND COAL MINES

Part C addresses the cost of proposed requirements for fire protection and detection and approval of the use of air from the belt entry to ventilate the working sections in underground coal mines. Proposed requirements that would have cost impacts include: § 75.156 AMS operator, qualifications; § 75.333 Ventilation controls; § 75.350 Belt air course ventilation; § 75.351 Atmospheric monitoring systems; § 75.371 Mine ventilation plan; contents; § 75.380 Escapeways; bituminous and lignite mines; § 75.381 Escapeways; anthracite mines; § 75.1103-4 Automatic fire sensor and warning device systems; installation; minimum requirements; § 75.1103-5 Automatic fire sensor and warning device systems; actions and response; § 75.1103-8 Automatic fire sensor and warning device systems; inspection and test requirements; and § 75.1731 Maintenance of belt conveyors and belt conveyor entries. The remaining sections of the proposed rule either have no cost or de minimis costs.

Number of Underground Coal Mines Required to Use an Atmospheric Monitoring System

Table IV-4 shows the number of mines in each employment category required to use an AMS. These would include all mines that: use air from the belt entry to ventilate the working sections; monitor electrical installations for fire; or monitor for methane under examination options.

Table IV-4. Number of Underground Coal Mines Required to Use an AMS

Mine Size	Number of Mines Required to Use an AMS Because of Using Belt Air	Number of Mines Required to Use an AMS, But Not Using Belt Air	Number of Mines Required to Use an AMS
1-19	3	0	3
20-500	45	26	71
501+	1	5	6
All Mines	49	31	80

§ 75.156 AMS Operator, Qualifications

Proposed § 75.156 would require that AMS operators be qualified, and that the AMS operators be able to demonstrate to MSHA that they are qualified to perform in their positions. Qualification would include task training as specified under proposed § 48.27. These proposed requirements would apply to all 80 mines that are required to use an AMS. MSHA estimates the average number of AMS operators per mine is 4 for the 3 mines with 1-19 employees, 6 for the 71 mines with 20-500 employees, and 8 for the 6 mines with 501+

employees. Therefore, there are currently 12 AMS operators at mines with 1-19 employees, 426 at mines with 20-500 employees, and 48 at mines with 501+ employees, for a total of 486 AMS operators trained in the first year. MSHA estimates a turnover rate of 7 percent, so that 34 new AMS operators would be task trained each year.

There are two cost categories for this new requirement. The first cost is the time spent by the AMS operator in proposed § 48.27 task training. MSHA estimates 4 hours at the miner's hourly wage of $33.70, or $135 for each of the 486 AMS operators. MSHA therefore estimates that the first year cost for all 486 existing AMS operators to receive training, at a cost of $135 per AMS operator, is $66,000. MSHA annualized this cost to $10,000 using a 0.159 annualization factor. The annual cost for the 34 new AMS operators each year to receive task training, at a cost of $135 per AMS operator, would be $4,600. In sum, the estimated yearly cost is $15,000.

The second cost would be the cost of instructors. For the first year, MSHA assumes 80 one-on-one instruction classes for all AMS operators at each of the 80 mines. Annually, MSHA assumes one instruction class per new AMS operator on an as-needed basis (a separate class for each one of the 34 new AMS operators a year). MSHA estimates 5 hours of instructor's time per class at the supervisor's hourly wage of $85.14, or $426 per instructor for each training class. Therefore, the estimated first-year cost for the 80 instructors to train AMS operators, at a cost of $426 per instructor, is $34,000. Applying an annualization factor of 0.159, MSHA annualized this cost to $5,400. The estimated annual cost, at a cost of $426 per instructor, to train 34 AMS operators one-on-one is $15,000. In sum, the estimated yearly cost is $20,000.

The total estimated yearly cost for these two cost categories is $35,000.

Additional impacts from the proposed revision to § 48.27 and proposed § 75.156 relate to existing §§ 48.23, 48.29, 75.159 and 75.161(b). Existing § 48.23 requires mine operators to modify training plans for task training of AMS operators. Each of the 80 mines required to use an AMS would need to submit a modification to their existing part 48 training plan to include an outline of training procedures that will be used and the titles of the personnel conducting the training for AMS operators. Existing § 48.29 requires making a record of the initial task training of AMS operators. Existing § 75.159 requires adding AMS operators to the list of all qualified persons. Existing § 75.161(b) requires mine operators to submit task training plans to MSHA for approval. MSHA estimates that the incremental cost of complying with these existing provisions would be negligible.

§ 75.333 Ventilation Controls

Proposed § 75.333(c)(4) would require mine operators to establish an airlock where the air pressure differential between air courses creates a static force exceeding 125 pounds on closed personnel doors along escapeways. Establishing an airlock would likely require installation of a second stopping or other ventilation control or device with a personnel door. MSHA estimates that no mines with 1-19 employees would need airlocks; 59 mines with 20-500 employees would establish one airlock, for a total of 59 airlocks; and 5 mines with 501+ employees would establish two airlocks, for a total of 10 airlocks. All 64 mines would install the sum of 59 and 10 airlocks, for a total of 69 airlocks. MSHA estimates that the materials cost per airlock is $1,000 and that the labor cost to install each airlock is 8 hours of labor at the miner's hourly wage of $33.70, for a total labor cost of $270. The estimated cost

per airlock is the sum of the materials cost of $1,000 and the labor cost of $270, or $1,270 per airlock. The estimated first-year cost for the 64 airlocks, at $1,270 per airlock, is $87,600. After applying an annualization factor of 0.159, the estimated yearly cost for this provision is $13,900. MSHA solicits comments on its estimates of the number of airlocks installed and on their cost.

Proposed § 75.371(yy) would require that the locations of these airlocks be included in the mine ventilation plan. MSHA estimates that revising the mine ventilation plan would require 10 minutes of time at the supervisor's hourly wage of $85.14 to revise the plan, for a cost of $14; 3 minutes of time at the clerical employee's hourly wage of $26.73 to copy and submit the plan, for a cost of $1; and $1.80 for copies and postage. The estimated cost per mine to revise the ventilation plan is the sum of the costs for supervisor time, clerical time, and copy and postage costs, which is $17. The estimated first-year cost for the 64 mines, at $17 per mine, is $1,100. Applying an annualization factor of 0.159, the estimated yearly cost of proposed provision is $180.

The estimated yearly cost of proposed §§ 75.333(c)(4) and 75.371(yy) is $14,100.

§ 75.350 Belt Air Course Ventilation

Proposed § 75.350(a)(2) would require that air velocity in the belt entry be at least 50 feet per minute, unless otherwise approved in the mine ventilation plan. Proposed § 75.371(jj) would require that the mine ventilation plan provide the locations where approved velocities are below this limit. MSHA estimates that 240 existing mines required to replace point-type heat sensors with carbon monoxide sensors would need approval from the District Manager to permit a lower air velocity in the belt entry. MSHA estimates the following costs: 20 minutes of time at the supervisor's hourly wage of $85.14 to make revisions to the mine ventilation plan, for a cost of $28; 6 minutes of time at the clerical employee's hourly wage of $26.37 to copy and submit revisions, for a cost of $3; and $2.00 in copy and postage costs. The estimated cost per mine to revise the mine ventilation plan is the sum of the costs for supervisor time, clerical time, and copying and postage costs, which is therefore $33. The estimated first-year cost for the 240 mines, at $33 per mine, is $7,900. Applying an annualization factor of 0.159, the estimated yearly cost of this provision is $1,300.

Proposed § 75.350(b) would require that the use of air from the belt entry to ventilate a working section, or an area where mechanized mining equipment is being installed or removed, be evaluated and approved by the District Manager and justification provided in the mine ventilation plan. The mine operator would have to show that use of air from a belt entry would afford at least the same measure of protection where belt haulage entries are not used to ventilate working places. Under the proposal, mine operators for all 49 existing mines using air from the belt entry to ventilate a working section, to continue using air from the belt entry to ventilate working sections, must provide justification in the mine ventilation plan to be approved by the District Manager. MSHA estimates the following costs: one hour of time at the supervisor's hourly wage of $85.14 to make revisions to the mine ventilation plan, for a cost of $85; 6 minutes of time at the clerical employee's hourly wage of $26.37 to copy and submit revisions, for a cost of $3; and $2 in copy and postage costs. The estimated cost per mine to revise the mine ventilation plan is the sum of the costs for supervisor's time, clerical employee's time, and copying and postage costs, which is therefore $90. The first-

year cost for the 49 mines, at $90 per mine, is $4,400. Applying an annualization factor of 0.159, the estimated yearly cost of this provision is $700.

Proposed § 75.350(b)(7) would require that air velocity in the belt entry be at least 100 feet per minute in mines that use air from the belt entry to ventilate working sections, unless otherwise approved in the mine ventilation plan. Proposed § 75.371(jj) would require that the mine ventilation plan contain the locations where approved velocities are below the minimum. MSHA estimates 12 mines using air from the belt entry to ventilate working sections would need approval to permit a lower air velocity in the belt entry. MSHA estimates the following costs: 20 minutes of time at the supervisor's hourly wage of $85.14 to make revisions to the mine ventilation plan, for a cost of $28; 6 minutes of time at the clerical employee's hourly wage of $26.37 to copy and submit revisions, for a cost of $3; and $2 in copy and postage costs. The estimated cost per mine to revise the ventilation plan is the sum of the costs for supervisor's time, clerical employee's time, and copy and postage costs, which is $33. The estimated first-year cost for the 12 mines, at $33 per mine, is $400. Applying an annualization factor of 0.159, the estimated yearly cost of this provision is $60.

Proposed § 75.350(b)(8) would require that air velocity in the belt entry not exceed 1,000 feet per minute in mines that use air from the belt entry to ventilate a working section, unless otherwise approved in the mine ventilation plan. Proposed § 75.371(jj) would require that the mine ventilation plan provide the locations where approved velocities are above this limit. MSHA estimates that 3 mines using air from the belt entry to ventilate a working section would need approval from the District Manager because of air velocity greater than 1,000 feet per minute in the belt entry. MSHA estimates the following costs: 20 minutes of time at the supervisor's hourly wage of $85.14 to make revisions to the mine ventilation plan, for a cost of $28; 6 minutes of time at the clerical employee's hourly wage of $26.37 to copy and submit revisions, for a cost of $3; and $2 in copy and postage costs. The estimated cost per mine to revise the ventilation plan is the sum of the costs for supervisor's time, clerical employee's time, and copy and postage costs, which is $33. The estimated first-year cost for the 3 mines, at $33 per mine, is $100. Applying an annualization factor of 0.159, the estimated yearly cost of this provision is $16.

Proposed § 75.350(d)(1) would require that, where possible, mines using air from the belt entry to ventilate working sections that also choose to point-feed the belt entry would have to monitor a second point in the primary escapeway for carbon monoxide 1,000 feet upwind of the point-feed regulator, unless otherwise approved in the ventilation plan. For each of the point-feed regulators, the estimated cost of a carbon monoxide sensor is $900, and the estimated installation cost is $34 (1 hour at the miner's hourly wage of $33.70), for a total cost of $930 each. MSHA estimates that 2 mines with 1-19 employees, 45 mines with 20-500 employees, and 1 mine with 501+ employees (a total of 48 mines) have point-feed regulators and also use air from the belt entry to ventilate working sections. MSHA estimates that the average number of point-feed regulators per mine is 1 for each of the 2 mines with 1-19 employees, 2 for each of the 45 mines with 20-500 employees, and 4 for the 1 mine with 501+ employees. The total number of point-feed regulators for these mines is the sum of 2 (1 each for the 2 mines with 1-19 employees), 90 (2 each for the 45 mines with 20-500 employees), and 4 (4 for the 1 mine with 501+ employees), for a total of 96 point-feed regulators. The estimated first-year cost of the proposed requirements to install a carbon monoxide sensor for each of the 96 point-feed regulators, at a cost of $930 each, is $90,000.

Applying an annualization factor of 0.252, the estimated yearly cost to install these 96 additional carbon monoxide sensors is $23,000. MSHA estimates that the annual cost of maintaining the additional carbon monoxide sensors would be equal to 2 percent of the initial purchase and installation cost of $90,000, or $1,800 to maintain the carbon monoxide sensors in the 48 mines. The estimated yearly cost to purchase, install, and maintain the additional carbon monoxide sensors is the sum of $23,000 and $1,800, or $24,000.

Some mines may be unable to comply with the proposed requirement of § 75.350(d)(1) that a second carbon monoxide sensor be placed 1,000 feet upwind of the point-feed regulator. These mines can request approval to locate the second carbon monoxide sensor less than 1,000 feet upwind. MSHA estimates that 1 mine using air from the belt entry to ventilate a working section would request to revise the mine ventilation plan, under existing § 75.371(mm), to permit shorter sensor spacing. MSHA estimates that the cost of this provision would be negligible.

Proposed § 75.350(d)(7) would require mines using air from the belt entry to ventilate working sections that choose to point-feed and use the belt entry as an alternate escapeway to be equipped with a means to remotely close the regulator or remotely isolate the two escapeways. MSHA estimates that 2 mines with 1-19 employees, 29 mines with 20-500 employees, and no mines with 501+ employees (a total of 31 mines) have point-feed regulators, use air from the belt entry to ventilate the working sections, and also use the belt entry as an alternate escapeway. MSHA estimates that the average number of point-feed regulators per mine utilizing point feeding is 1 for the 2 mines with 1-19 employees and 2 for the 29 mines with 20-500 employees. The total number of point-feed regulators is the sum of 2 (1 each for the 2 mines with 1-19 employees) and 58 (2 each for the 29 mines with 20-500 employees), for a total of 60 point-feed regulators. MSHA estimates that, for each point-feed, the cost of the materials to remotely close the regulator or remotely isolate the two escapeways would be $1,000, and the installation cost would be $400 (12 hours at the miner's hourly wage of $33.70), for a cost of $1,400 each. The estimated first-year cost of the proposed requirements to remotely close the regulators or remotely isolate the two escapeways for all 60 point-feed regulators, at a cost of $1,400 each, is $84,000. Applying an annualization factor of 0.252, the estimated yearly cost to install these means to remotely close the regulators or remotely isolate the two escapeways is $13,000.

§ 75.351 Atmospheric Monitoring Systems

For mines that are required to have an AMS, proposed § 75.351(b)(2) would require a designated AMS operator who has as a primary duty the responsibility to monitor the malfunction, alert, and alarm signals of the AMS and to notify proper personnel of these signals. MSHA estimates that the largest mines would not incur costs as a result of this proposed requirement because that has already been designated as a primary duty of an AMS operator in these mines. However, MSHA estimates that in some smaller mines, as a result of this proposed requirement, a portion of the duties of the AMS operator would have to be reassigned to other miners. MSHA estimates that these mines would incur additional miner costs of two hours per shift at the miner's hourly wage of $33.70, or approximately $67 per shift. MSHA estimates that 3 mines with 1-19 employees, 18 mines with 20-500 employees, and no mines with 501+ employees would incur costs from this provision, for a total of 21 mines. The number of shifts would be 1 daily for 260 workdays in each of the 3 mines with

1-19 employees, for at total of 780 shifts; and 2 daily for 312 workdays in each of the 18 mines with 20-500 employees, for a total of 11,200 shifts. The total number of shifts for all 21 mines would be the sum of 780 and 11,200, or approximately 12,000 shifts. The estimated annual cost of this requirement for all 12,000 shifts, at a cost of $67 per shift, is $810,000.

Under proposed § 75.351(e)(1)(iii), in mines using air from the belt entry to ventilate working sections, carbon monoxide sensors would have to be spaced at intervals no greater than 500 feet in areas along each belt entry where air velocities are between 50 and 100 feet per minute. MSHA estimates that 2 mines with 1-19 employees, 23 mines with 20-500 employees, and 1 mine with 501+ employees would be affected by this provision, for a total of 26 mines. MSHA estimates that the average number of additional carbon monoxide sensors per mine is 1 for the 2 mines with 1-19 employees, 2 for the 23 mines with 20-500 employees, and 3 for the 1 mine with 501+ employees. The total number of carbon monoxide sensors needed under the proposed requirement would be the sum of 2 (1 each for the 2 mines with 1-19 employees), 46 (2 each for the 23 mines with 20-500 employees), and 3 (3 for the 1 mine with 501+ employees), for a total of 51 carbon monoxide sensors. MSHA estimates that each carbon monoxide sensor costs $900 and requires one hour of labor, at the miner's hourly wage of $33.70, for installation, for an estimated cost per installed carbon monoxide sensor of $930. The estimated first-year cost to install the 51 additional carbon monoxide sensors, at a cost of $930 per sensor, is $48,000. Applying an annualization factor of 0.252, the estimated yearly cost is $12,000. MSHA estimates that the annual cost of maintaining the additional carbon monoxide sensors would be equal to 2 percent of the initial purchase and installation cost of $48,000, or $1,000. The estimated yearly cost to purchase, install, and maintain the additional 51 carbon monoxide sensors is the sum of $12,000 and $1,000, or $13,000.

Proposed § 75.351(e)(2) would require smoke sensors to be installed at or near the working section belt tailpiece in the air stream ventilating the belt entry, and no more than 100 feet downwind of each belt drive unit, tailpiece transfer point, and belt take-up. Smoke sensors also would have to be installed at intervals not to exceed 3,000 feet. This proposed provision would take effect one year after the Secretary has determined that a smoke sensor is available to reliably detect fire in underground coal mines.

Proposed § 75.351(q)(1) would outline required subjects that must be included in the annual training of an AMS operator. Because existing § 75.351(q) already requires all AMS operators to be trained annually, MSHA estimates that there would be no additional cost associated with this proposed provision.

Proposed § 75.351(q)(2) would require AMS operators to travel to all working sections every six months. This would affect only the 80 mines that are required to use an AMS. For the 3 mines with 1-19 employees, MSHA estimates an average of 4 AMS operators per mine and an average of 8 hours annually for each AMS operator to travel to all working sections every six months, for a total of 96 hours (3 mines x 4 AMS operators x 8 hours) annually. For the 71 mines with 20-500 employees, MSHA estimates an average of 6 AMS operators per mine and an average of 12 hours annually for each AMS operator to travel to all working sections every six months, for a total of 5,112 hours (71 mines x 6 AMS operators x 12 hours). For the 6 mines with 501+ employees, MSHA estimates an average of 8 AMS operators per mine and an average of 16 hours annually for each AMS operator to

travel to all working sections every six months, for a total of 768 hours (6 mines x 8 AMS operators x 16 hours). The total number of hours required annually to comply with this proposed provision would be the sum of 96 hours for mines with 1-19 employees, 5,112 hours for mines with 20-500 employees, and 768 hours for mines with 501+ employees, for a total of 5,976 hours. The estimated annual cost of the 5,976 hours, at the miner's hourly wage of $33.70, required for all 486 AMS operators to travel to all working sections every six months, is $200,000.

§ 75.352 Atmospheric Monitoring System Alarm Units

Proposed § 75.352(g) would require that any AMS monitoring a point-feed regulator automatically provide both a visual and audible signal in the belt entry at the point-feed regulator location, at affected sections, and at the designated surface location when carbon monoxide concentrations reach: (1) the alert level at both point-feed intake monitoring sensors; or (2) the alarm level at either point-feed intake monitoring sensor. This would require installing an additional alarm unit. For each of the point-feeds, the estimated cost of an alarm unit is $600, and the estimated installation cost is $17 (0.5 hours at the miner's hourly wage of $33.70), for a total cost of $620 each. MSHA estimates that 2 mines with 1-19 employees, 45 mines with 20-500 employees, and 1 mine with 501+ employees (a total of 48 mines) have point-feed regulators and also use air from the belt entry to ventilate the working sections. MSHA estimates that the average number of point-feed regulators per mine is 1 for each of the 2 mines with 1-19 employees, 2 for each of the 45 mines with 20-500 employees, and 4 for the 1 mine with 501+ employees. The total number of point-feed regulators for these mines is the sum of 2 (1 each for the 2 mines with 1-19 employees), 90 (2 each for the 45 mines with 20-500 employees), and 4 (4 for the 1 mine with 501+ employees), for a total of 96 point-feed regulators. The estimated first-year cost of the proposed requirements to install an alarm unit for each of the 96 point-feed regulators, at a cost of $620 each, is $59,000. Applying an annualization factor of 0.252, the estimated yearly cost to install these 96 additional alarm units is $15,000. MSHA estimates that the annual cost of maintaining the additional alarm units would be equal to 2 percent of the initial purchase and installation cost of $59,000, or $1,100 to maintain the alarm units in the 48 mines. The estimated yearly cost to purchase, install, and maintain the additional alarm units is the sum of $15,000 and $1,100, or $16,000.

§ 75.371 Mine Ventilation Plan; Contents

Under proposed § 75.371(mm), the District Manager could require the use of diesel-discriminating sensors in the mine ventilation plan. MSHA estimates that this requirement would affect 21 mines: 3 mines with 1-19 employees; 18 mines with 20-500 employees; and no mines with 501+ employees. For the 3 mines with 1-19 employees, MSHA estimates an average of 2 diesel-discriminating sensors per mine, for a total of 6 diesel-discriminating sensors. For the 18 mines with 20-500 employees, MSHA estimates an average of 3 diesel-discriminating sensors per mine, for a total 54 diesel-discriminating sensors. The total number of diesel-discriminating sensors required under proposed § 75.371(mm) would be the sum of the 6 for mines with 1-19 employees and the 54 for mines with 20-500 employees, for a total of 60 diesel-discriminating sensors. MSHA estimates that material costs for a diesel-discriminating sensor would be $900, and that the installation of a diesel-discriminating

sensor would be $34 (one hour of a miner's time at an hourly wage of $33.60), for a total cost of $934 to purchase and install a diesel-discriminating sensor. The estimated first-year cost to purchase and install the 60 diesel-discriminating sensors, at a cost of $934 per sensor, is $56,000. Applying an annualization factor of 0.252, the estimated yearly cost to purchase and install the 60 diesel-discriminating sensors is $14,000. The annual maintenance for the 60 diesel-discriminating sensors would equal 2 percent of the first-year cost of $56,000, or $1,000. The estimated yearly cost of installation and maintenance for the 60 diesel-discriminating sensors is the sum of $14,000 and $1,000, or $15,000.

Proposed § 75.371(mm) would also require the location of diesel-discriminating sensors that are installed in the belt air course to be contained in the mine ventilation plan for the 21 mines required to install diesel discriminating sensors. MSHA estimates that this provision would have a negligible cost.

Proposed § 75.371(nn) would require reporting the length of the time delay or other method used to reduce non-fire-related alerts and alarms. MSHA estimates that this reporting requirement would affect 40 mines that use diesel equipment and that would be required to install carbon monoxide sensors. MSHA estimates that this provision would have a negligible cost.

Proposed § 75.371 would require that the mine ventilation plan contain additional information. The proposal would require mine operators to revise the mine ventilation plan, to post all revisions of the mine ventilation plan, and to provide copies to the miner's representative, upon request, of any revision to the mine ventilation plan. The cost of the revisions of the mine ventilation plan, as required under existing § 75.370(a)(2), are estimated in this PREA under the separate sections of the proposed rule, as appropriate.

Mine operators are required to post all revisions of the mine ventilation plan, under existing § 75.370(a)(3). MSHA estimates that the provisions of the proposed rule would require the posting of 1,300 revisions to the mine ventilation plans, consisting of 5,000 pages. MSHA estimates that copying each revision costs $2.64 (6 minutes of time at the clerical employee's hourly wage of $26.37) and that copies cost $0.15 per page. Hence, copying 1,300 revisions, at $2.64 a revision, costs $3,500 in labor time and copies of 5,300 pages, at $0.15 a copy, cost $800 in copy expense, for an initial cost of $4,200. When this initial cost of $4,200 is annualized using a 0.159 annualization factor, the yearly cost is $670.

Mine operators are required to provide copies to the miners' representative, upon request, of any revision to the mine ventilation plan, under existing § 75.370(f). Of the revisions to the mine ventilation plan required by the provisions of the proposed rule, MSHA estimates that 30 percent would be copied and provided to the miners' representative. Accordingly, 30 percent of 1,300 revisions, or 400 revisions, consisting of 30 percent of 5,000 pages, or 1,500 pages, would be copied and provided to the miners' representative. MSHA estimates that copying each revision costs $2.64 (6 minutes of time at the clerical employee's hourly wage of $26.37) and that copies cost $0.15 per page. Hence, copying 400 revisions, at $2.64 a revision, costs $1,000 in labor time and copies of 1,500 pages, at $0.15 a copy, cost $230 in copying expense, for an initial cost of $1,300. When this initial cost of $1,300 is annualized using a 0.159 annualization factor, the yearly cost is $200.

MSHA estimates that the yearly cost of the proposed rule to post all revisions of the mine ventilation plan and to provide copies to the miners' representative, upon request, of any revision to the mine ventilation plan is the sum of $670 and $200, or $880.

§ 75.380 Escapeways; Bituminous and Lignite Mines and § 75.381 Escapeways; Anthracite Mines

Proposed §§ 75.380(d)(7)(v)-(viii) and 75.381(c)(5)(v)-(viii) would require that escapeways be equipped with one directional indicator cone to signify the route of escape; that the cones be placed at intervals of no more than 100 feet; that six back-to-back directional cones provide tactile feedback indicating the location of any SCSR storage locations in the escapeways; that four back-to-back directional cones provide tactile feedback indicating the location of readily accessible feedback for personnel doors installed in adjacent escapeways; and that two back-to-back directional cones provide tactile feedback indicating the location of any physical impediments in the escapeways. In addition, proposed §§ 75.380(d)(7)(ix) and 75.381(c)(5)(ix) would require a two-foot length of cork-screw style spiraled coil to provide tactile feedback indicating the location of the refuge alternative and another line attached from the lifeline to the refuge alternative.

The proposed provisions would affect all 624 underground coal mines. MSHA estimates that the average number of additional cones per mine under proposed §§ 75.380(d)(7)(v)-(viii) and 75.381(c)(5)(v)-(viii) is 100 each for the 223 mines with 1-19 employees, for a total of 22,300 additional cones; 420 each for the 391 mines with 20-500 employees, for a total of 164,220 additional cones; and 850 each for the 10 mines with 501+ employees, for a total of 8,500 additional cones. The total number of additional cones for all 624 mines would be the sum of 22,300, 164,220, and 8,500 for these mine sizes, for a total of 195,000 additional cones. MSHA estimates materials cost per cone of $10 and labor cost per cone of $1 for installation, for a total of $11 per cone. The estimated first-year cost to purchase and install 195,000 additional cones, at $11 per cone, is $2.1 million. Applying an annualization factor of 0.159, the estimated yearly cost is $330,000.

MSHA estimates that each refuge alternative in underground coal mines would require, under proposed §§ 75.380(d)(7)(ix) and 75.381(c)(5)(ix), a two-foot length of cork-screw style spiraled coil to provide tactile feedback indicating the location of the refuge alternative and another line attached from the lifeline to the refuge alternative. Based on an economic analysis of the Agency's proposed rule on refuge alternatives in underground coal mines, MSHA estimates a total of 1,168 refuge alternatives would be required in underground coal mines. MSHA estimates a cost of $15 for each two-foot length of cork-screw style spiraled coil, a cost of $10 for a 50-foot line to attach from the lifeline to the refuge alternative, and a labor cost of $6 (10 minutes at a miner's wage of $33.70) to attach the coil and the line, for a total cost of $31 per refuge alternative. The estimated first-year cost for all 1,168 refuge alternatives, at a cost of $31 each, is $35,800. Applying an annualization factor of 0.159, the estimated yearly cost for all 1,168 refuge alternatives is $6,000.

The estimated cost of proposed §§ 75.380(d)(7)(v)-(ix) and 75.381(c)(5)(v)-(ix) is the sum of $330,000 and $6,000, or $336,000.

Proposed §§ 75.380(f) and 75.381(e) would require that the primary escapeway have higher ventilation pressure than the belt entry, unless the mine operator submits an alternative in the mine ventilation plan to protect the integrity of the primary escapeway based on mine specific conditions. The alternative must be approved by the District Manager.

MSHA estimates that 112 mines with 1-19 employees, 352 mines with 20-500 employees, and all 10 mines with 501+ employees would be affected by this requirement, for a total of 474 mines. MSHA estimates the requirement would cost $28 for 20 minutes of a supervisor's time, at $85.14 per hour; $3 for 6 minutes of a clerical employee's time, at $26.37 per hour; and $2 in copy and postage costs per mine to submit an alternative mine ventilation plan. The estimated cost per mine to revise the mine ventilation plan is the sum of the costs for supervisor's time, clerical employee's time, and copy and postage costs, which is $33. The estimated first-year cost for the 474 mines to revise the mine ventilation plan, at a cost of $33 per mine, is $15,700. Applying an annualization factor of 0.159, the estimated yearly cost is $2,500.

§ 75.1103-4 Automatic Fire Sensor and Warning Device Systems; Installation; Minimum Requirements

Proposed § 75.1103-4(a)(1) would require the installation and maintenance of carbon monoxide sensors. Under this requirement, all 479 mines currently using point-type heat sensors would have to purchase and install carbon monoxide sensors. MSHA estimates that the cost to purchase and install carbon monoxide sensors would be $9,900 each for the 210 mines with 1-19 employees, for a total cost of $2.1 million. MSHA estimates that the cost to purchase and install carbon monoxide sensors would be $28,400 each for the 269 mines with 20-500 employees, for a total cost of $7.6 million. MSHA estimates that no mines with 501+ employees would have to purchase and install carbon monoxide sensors under this requirement, because these mines currently have carbon monoxide sensors installed to monitor the belt entry. The estimated first-year cost to purchase and install carbon monoxide sensors for the 479 mines is the sum of $2.1 million and $7.6 million, or $9.7 million. Applying a 0.252 annualization factor, the estimated annualized cost is $2.4 million. MSHA estimates that the annual cost of maintaining carbon monoxide sensors for the 479 mines would be equal to 2 percent of the initial purchase and installation cost of $9.7 million, or $190,000. The yearly cost is the sum of the annualized cost of $2.4 million and the annual cost of $190,000, or $2.6 million.

Under this proposal, new mines, starting in the first year, would no longer have to incur the cost to install point-type heat sensors. This avoided cost for new mines would partially offset the cost of purchasing and installing carbon monoxide sensors. Based on an analysis conducted on April 4, 2008 by MSHA's Office of Policy Evaluation in Information Resources (PEIR) of MSHA data for 2003-2007, the Agency estimates that each year there would be 38 new underground coal mines with 1-19 employees that would no longer install point-type heat sensors, and 22 new underground coal mines with 20-500 employees that would no longer install point-type heat sensors, for a total of 60 new mines per year that no longer install point-type heat sensors. MSHA estimates that point-type heat sensors would cost $22,700 for each of the 38 mines with 1-19 employees, for a total cost of $860,000; MSHA estimates that point-type heat sensors would cost $69,600 for each of the 22 mines

with 20-500 employees, for a total cost of $1.5 million. The partial cost offset from the provision would be the sum of $860,000 and $1.5 million, or $2.4 million per year.

Proposed § 75.1103-4(a)(1)(iii) would require that carbon monoxide sensor spacing not exceed 1,000 feet. Some existing mines have petitions or equivalent systems that allow carbon monoxide sensor spacing of 2,000 feet. MSHA estimates that there are a total of 65 of these mines: 7 with 1-19 employees; 52 with 20-500 employees; and 6 with 501+ employees. MSHA estimates that the number of additional carbon monoxide sensors needed per mine due to this requirement would be 2 for the 7 mines with 1-19 employees, for a total of 14 additional carbon monoxide sensors; 30 for the 52 mines with 20-500 employees, for a total of 1,560 additional carbon monoxide sensors; and 50 for the 6 mines with 501+ employees, for a total of 300 additional carbon monoxide sensors. For all 65 mines, the total number of additional carbon monoxide sensors would be the sum of 14, 1,560, and 300 for the three mine sizes, or 1,874 additional carbon monoxide sensors. MSHA estimates that each carbon monoxide sensor costs $900 and requires $34 for installation (one hour of labor at the miner's hourly wage of $33.70). The estimated cost per installed carbon monoxide sensor is the sum of the cost of a sensor and the cost of installation, which is $930. The estimated first-year cost for the additional 1,874 carbon monoxide sensors, at a cost of $930 each, is $1.7 million for all 65 mines. Applying a 0.252 annualization factor, the estimated annualized cost for the additional 1,874 carbon monoxide sensors for all 65 mines is $440,000. MSHA estimates that the annual cost of maintaining the 1,874 additional carbon monoxide sensors would be equal to 2 percent of the initial purchase and installation cost of $1.7 million, or $35,000. The estimated yearly cost to purchase, install, and maintain the additional 1,900 carbon monoxide sensors is the sum of $440,000 and $35,000, or $480,000.

§ 75.1103-5 Automatic Fire Warning Devices; Actions and Responses

Under proposed revisions to § 75.1103-5(a), when the carbon monoxide level reaches 10 parts per million above the established ambient level at any sensor location, the automatic carbon monoxide fire sensor and warning device system would need to provide warning at all working sections and at a manned surface location where personnel have an assigned post of duty.

This proposal would affect all 479 mines that would be required to replace point-type heat sensors with carbon monoxide sensors. MSHA estimates that the additional time needed to monitor the carbon monoxide sensors for the 210 mines with 1-19 employees would be, on average, 10 minutes per shift at the miner's hourly wage of 33.70, or $5.60 per shift. The total number of shifts a year would be the product of the 210 mines, 1 shift per day, and 260 days per year, for a total of 54,600 shifts per year for mines with 1-19 employees. The total annual cost of monitoring the carbon monoxide sensors for the mines with 1-19 employees would be 54,600 shifts, at $5.60 per shift, or $300,000. MSHA estimates that the additional time needed to monitor the carbon monoxide sensors for the 269 mines with 20-500 employees would be, on average, 15 minutes per shift at the miner's hourly wage of $33.70, or $8.40 per shift. The total number of shifts would be the product of the 269 mines, 2 shifts per day, and 312 days per year, for a total of 167,856 shifts, at $8.40 per shift, or $1.4 million. MSHA estimates no mines with 501+ employees would be required to replace point-type heat sensors with carbon monoxide sensors. The estimated annual cost for all 469 mines is the sum of $300,000 and $1.4 million, or $1.7 million.

Under existing § 75.371(hh), the mine operators for all 479 mines that would be required to install carbon monoxide sensors to replace heat-type sensors would be required to revise their mine ventilation plan to include carbon monoxide ambient levels for the new carbon monoxide sensors. MSHA estimates that the revisions to the mine ventilation plan would take 15 minutes of a supervisor's time at $85.14 per hour, for a cost of $21; 6 minutes of a clerical employee's time at $26.37 per hour, for a cost of $3; and $2 in copy and postage costs. The estimated first year cost per mine is the sum of the costs of the supervisor's time, clerical employee's time, and copy and postage costs, which is $26. The estimated first year cost for the 479 mines, at $26 per mine, is $12,500. Applying a 0.159 annualization factor, the estimated yearly cost is $2,000.

MSHA estimates that 240 of the 479 mines that would be required to install carbon monoxide sensors would determine an ambient level of carbon monoxide in the belt entry above zero. Under existing § 75.371(hh), these mines would need to include in their mine ventilation plans the method for determining the ambient level, including a justification based on a study of conditions present at the mine. MSHA estimates that 8 hours of a supervisor's time, on average, at an hourly wage of $85.14, would be required to accomplish this, for a cost per mine of $680. The estimated first year cost for the 240 mines, at $680 per mine, is $163,000. Applying an annualization factor of 0.159, the estimated yearly cost is $26,000.

Proposed § 75.1103-5(a)(2)(ii) would require a map or schematic showing the locations of carbon monoxide sensors and the intended direction of air flow. The map or schematic would also have to be updated within 24 hours of any changes in sensor locations. This proposed provision would affect all 479 mines that would be required to install carbon monoxide sensors to replace heat-type sensors. This provision has both initial costs and recurring costs.

The initial cost for the 479 mines that would need to install carbon monoxide sensors to replace point-type sensors is approximately $25 for labor (30 minutes of labor time at the mine engineer's hourly wage of $50) and $10 to print a map on special mine map paper, for a total cost of approximately $35 per mine. The estimated initial cost for the 479 mines, at a cost of $35 per mine, is $17,000. Applying an annualization factor of 0.159, to the initial cost of $17,000 for all 479 mines, the estimated annualized cost corresponding to the initial cost is $2,700.

MSHA estimates the recurring cost is 1 hour per year (5 minutes per month) of a mine engineer's time at the hourly wage of $50, for an annual cost per year of $50 per mine. For 479 mines, at an annual cost of $50 per mine, this is an annual cost of $24,000. Combining the $2,700 annualized value of the initial cost with the $24,000 annual cost, MSHA estimates the yearly cost of this provision as $27,000.

Proposed § 75.1103-5(d), (e), and (f) are analyzed together and would apply to the 479 mines that would be required to install carbon monoxide sensors. The cost analysis focuses only on alerts, alarms, or malfunctions that are not related to any hazard. If the carbon monoxide sensors detect a hazard, the sensors are functioning as intended. In such circumstance, the mine operator and mine workers can only be aided, not harmed, by early signal of a hazard.

Paragraph (f) specifies actions that must be taken if any carbon monoxide sensor indicates a warning, unless the operator determines that the signal does not present a hazard to miners. MSHA expects that many carbon monoxide warning signals would have obvious causes that are immediately known not to present a hazard to miners. These obvious non-hazard signals are more common in mines that use diesel equipment due to the emission of carbon monoxide from diesel equipment. MSHA estimates that these incidents of warning signals with obvious non-hazard causes would occur 80 times per year in each of the 106 mines with diesel equipment that would be required to install carbon monoxide sensors, for a total of 8,480 times a year for all 106 mines. In mines without diesel equipment, MSHA estimates that these incidents of warning signal with obvious non-hazard sources would occur 0.5 times a year for the 195 mines with 1-19 employees, for a total of 98 times a year for these 195 mines; and 1 time a year for each of the 178 mines with 20-500 employees, for a total of 178 times for the 178 mines. The total number of these incidents per year for all 479 mines would be the sum of 8,480 for mines with diesel equipment, 98 and 178, for mines without diesel equipment, or 8,756 incidents per year. For each of these incidents, MSHA estimates a cost of $1.12 (two minutes of a miner's time at an hourly wage of $33.70) to ascertain that the cause is not hazardous. The estimated annual cost of miner-hours for the 479 mines to ascertain, in obvious cases, that the cause of a warning signal is not hazardous is the product of the 8,756 incidents and the $1.12 cost per incident, or $9,800.

For warning signals whose causes are not obvious, MSHA estimates that the time spent annually looking for the causes would be 1.25 hours for each of the 210 mines with 1-19 employees, for a total of 263 hours; and 2.5 hours for each of the 269 mines with 20-500 employees for a total of 672 hours. The total number of hours spent annually for all 479 mines for causes of warning signals that are not obvious is the sum of 263 and 672, or 935 hours. The estimated annual cost of the 935 hours, at a miner's hourly wage of $33.70, is $31,500.

For warning signals that are not related to a hazard, miners may need to be withdrawn to a safe location because it cannot be immediately determined that the cause of the signal does not present a hazard. MSHA estimates that the number of times a year miners would be withdrawn for this reason is 0.25 times a year for each of the 210 mines with 1-19 employees, for a total of 53 times per year; and 0.5 times a year for each of the 269 mines with 20-500 employees, for a total of 135 times per year. The total number of withdrawals annually for all 479 mines is the sum of 52 and 135, or 187 withdrawals per year. MSHA estimates that, on average, each withdrawal would last for one hour for a section of eight miners, for a total of 8 hours per withdrawal. The cost per worker is 8 hours at a miner's hourly wage of $33.70, or $270 per withdrawal. The estimated annual cost for 187 withdrawals, at a cost of $270 per withdrawal, is $50,500.

MSHA expects that, with proper maintenance, carbon monoxide sensor malfunctions would occur relatively infrequently. MSHA estimates that the number of carbon monoxide sensor malfunctions a year would be 0.5 for each of the 210 mines with 1-19 employees, for a total of 105 malfunctions per year; and 1 for each of the 269 mines with 20-500 employees, for a total of 269 malfunctions a year. The total number of malfunctions a year for all 479 mines would be the sum of 105 and 269, or 374 malfunctions a year. MSHA estimates that these malfunctions would be easily corrected and would cost, on average, $8 (15 minutes of a

miner's time at an hourly wage of $33.70). The estimated annual cost of the 374 malfunctions, at a cost of $8 each, is $3,100.

The total estimated annual cost of responding to non-hazard related signals is $95,000.

§ 75.1103-8 Automatic Fire Sensor and Warning Device Systems; Inspection and Test Requirements

Proposed § 75.1103-8(a) would require automatic fire sensors and warning device systems to be examined at least once per shift when belts are used as part of a production shift, and require a test of the warning signals once every seven days. This provision affects the 479 mines that would be required to install carbon monoxide sensors.

MSHA believes this examination is likely to be conducted at the same time as the existing pre-shift and on-shift examinations. MSHA believes that any additional cost associated with the examination of the automatic fire sensor and warning systems each shift would be offset by the reduction in cost to examine point-type heat sensors each shift.

MSHA estimates the number of warning units tested per week would be 1 for each of the 210 mines with 1-19 employees, for a total of 210 warning units tested per week; and 2 for each of the 269 mines with 20-500 employees, for a total of 538 warning units tested per week. MSHA estimates that no mines with 501+ employees would incur additional cost under this requirement. For all 479 mines, the number of warning units tested per week would be the sum of 210 and 539, or 748 warning units tested per week. MSHA estimates that the cost of testing each warning unit would be $21 (15 minutes of a supervisor's time at an hourly wage of $85.14). The estimated annual cost per warning unit over 52 weeks, at a weekly cost of $21, is $1,100. The estimated annual cost for testing all 748 warning units under this provision, at an annual cost of $1,100 per warning unit, for all 479 mines is $828,000.

Proposed § 75.1103-8(b) would require a record of the test performed under § 75.1103-8(a) to be maintained and kept by the operator for one year. As calculated above, MSHA estimates that 748 warning units would be tested per week. MSHA estimates that the labor cost for recordkeeping for each unit tested would be $1.14 (0.8 minutes of supervisor's time, at an hourly wage of $85.14) per record of warning unit testing. The estimated annual labor cost for recordkeeping per warning unit for 52 weeks, at $1.14 per week, is $59. In addition, the annual cost for paper for recordkeeping is estimated to be $1 (8 pages at $0.15 per page). The estimated annual cost to make a record for all warning units under this provision for all 748 warning units, at an annual recordkeeping cost of $60 per warning unit, is $45,000.

Under proposed § 75.1103-8(c) carbon monoxide sensors must be calibrated at intervals of no more than 31 days. The operator would have to keep a record of the sensor calibrations for one year.

This provision would apply to all carbon monoxide sensors required under the proposed rule. MSHA estimates that there are 1,068 sensors in mines with 1-19 employees, 7,076 sensors in mines with 20-500 employees, and 307 sensors in mines with 501+ employees, for a total of 8,451 sensors. MSHA estimates the labor cost to calibrate a carbon

monoxide sensor would be $23 (16 minutes per month at the supervisor's hourly wage of $85.14). MSHA estimates that the cost of a gas cylinder for calibration is $80 and that each gas cylinder would, on average, have sufficient gas for 20 calibrations, for a cost per calibration of $4. The cost per monthly calibration of a carbon monoxide sensor is the sum of the labor cost of $23 and the gas cost of $4, or $27. The estimated annual cost for 12 calibrations per carbon monoxide sensor, at $27 per calibration, is $320. The estimated annual cost for calibration of all 8,451 carbon monoxide sensors required under the proposed rule, at an annual cost of $320 for each carbon monoxide sensor, is $2.7 million.

MSHA estimates the costs of recordkeeping for monthly calibration of a carbon monoxide sensor to be $1.14 for labor (0.8 minutes per record at the supervisor's hourly wage of $85.14), plus $0.02 for material costs (2 percent of labor costs). MSHA estimates that there are 1,068 sensors in mines with 1-19 employees, 7,076 sensors in mines with 20-500 employees, and 307 sensors in mines with 501+ employees, for a total of 8,451 sensors. The estimated cost to make a record of monthly calibration of a carbon monoxide sensor is the sum of the labor cost of $1.14 and the materials cost of $0.02, for a total of $1.16 per record. The estimated annual cost per carbon monoxide sensor for 12 months, at $1.16, is $14. The estimated annual cost to make a record for all carbon monoxide sensors under this provision for all 8,451 sensors, at a cost of $14 per sensor, is $117,000.

This provision would also apply to the estimated 60 diesel-discriminating sensors required under this proposal. MSHA estimates the calibration of each diesel-discriminating sensor would cost $1.40 (1 additional minute per month of a supervisor's time at an hourly wage of $85.14), and that there would be no additional recordkeeping cost. MSHA estimates that a gas cylinder for calibration costs $80 and can last 20 calibrations, for a cost of $4 per calibration. The cost per monthly calibration is the sum of the labor and gas costs, or $5.40 per calibration. The estimated annual cost for 12 calibrations per diesel-discriminating sensor, at $5.40 per calibration, is $65. The estimated annual cost for calibration of all 60 diesel-discriminating sensors, at a cost of $65 per diesel-discriminating sensor, is $3,900.

§ 75.1731 Maintenance of Belt Conveyors and Belt Conveyor Entries

Proposed § 75.1731 provides requirements for proper maintenance of belt conveyors and belt entries. These requirements would apply to all 624 underground coal mines. MSHA estimates that the additional time needed each year to properly maintain belt conveyors and belt entries would, on average, be 100 hours for each of the 223 mines with 1-19 employees, for a total of 22,300 hours; 200 hours for each of the 391 mines with 20-500 employees, for a total of 78,200 hours; and 400 hours for each of the 10 mines with 501+ employees, for a total of 4,000 hours. The total number of hours annually for all 624 mines is the sum of 22,300, 78,200, and 4,000, or 105,000 hours. The cost per hour is the miner's hourly wage of $33.70. The estimated annual cost for all 624 mines of 105,000 hours for belt conveyor entry maintenance, at a cost of $33.70 per worker, is $3.5 million.

FEASIBILITY

MSHA has concluded that the requirements of the proposed rule would be both technologically and economically feasible.

Technological Feasibility

The proposed rule does not involve activities on the frontiers of scientific knowledge. Aside from proposed § 75.351(e)(2), compliance with the provisions of the proposed rule is technologically feasible because the materials, equipment, and methods for implementing these requirements currently exist.

Proposed section 75.351(e)(2) would require mines that use air from the belt entry to ventilate working sections to install smoke sensors one year after approval for use in underground coal mines. Smoke sensors are not technologically feasible because these sensors are not commercially available for use in underground coal mining. MSHA will notify the public when smoke sensors become available and are approved for use in underground coal mining.

Economic Feasibility

The yearly compliance cost of the proposed rule would be approximately $51.8 million for underground coal mines, which is 0.37 percent of annual revenue of $14.1 billion for all underground coal mines. MSHA concludes that the proposed rule would be economically feasible for these mines because the total yearly compliance cost is below one percent of the estimated annual revenue for all underground coal mines.

V. REGULATORY FLEXIBILITY CERTIFICATION AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

INTRODUCTION

Under 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. The factual basis for this certification is presented below.

DEFINITION OF A SMALL MINE

Under the RFA, in analyzing the impact of a 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 definition. The SBA defines a small entity in the mining industry as an establishment with 500 or fewer employees (13 CFR 121.201).

MSHA has also examined the impact of the proposed rule on 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 costs of complying with MSHA's rules and the impact of the agency's rules on small mines will also be different.

This analysis complies with the legal requirements of the RFA for an analysis of the impact on “small entities” while continuing MSHA's traditional concern for “small mines.”

FACTUAL BASIS FOR CERTIFICATION

General Approach

MSHA’s analysis of the economic impact on small entities begins with a “screening” analysis. The screening analysis compares the estimated yearly cost of a rule for small entities to their estimated annual revenue. When the estimated cost is less than one percent of the estimated revenue for small entities, MSHA believes it is generally appropriate to conclude that the proposed rule would not have a significant economic impact on a substantial number of small entities. If estimated cost is equal to or exceeds one percent of revenue, MSHA will investigate whether further analysis is required.

Derivation of Costs and Revenues for Mines

The compliance costs noted in this chapter were previously presented in Chapter IV of this PREA along with an explanation of how they were derived. Revenue for underground coal mines is derived from data on underground coal prices and tonnage. The 2006 price of

underground coal was $38.28 per ton.[8] To estimate the 2007 price, the 2006 price was increased by 5.5 percent to $40.37, using the Bureau of Labor Statistics Producer Price Index for underground bituminous coal.

Total underground coal production in 2007 was approximately 7.7 million tons for mines with 1-19 employees. Multiplying tons by the 2007 price per ton, 2007 underground coal revenue was $310 million for mines with 1-19 employees. Total underground coal production in 2007 was approximately 278 million tons for mines with 1-500 employees. Multiplying tons by the 2007 price per ton, 2007 underground coal revenue was $11.2 billion for mines with 1-500 employees. Total underground coal production in 2007 was approximately 349 million tons. Multiplying tons by the 2007 price per ton, total estimated revenue in 2007 for underground coal production was $14.1 billion.

Results of Screening Analysis

Table V-1 below shows the cost of the proposed rule compared to mine revenue, by mine size.

Table V-1. Cost of Proposed Rule Compared to Mine Revenue, by Mine Size, for Underground Coal Mine Operators

Employment Size	No. of Mines	Cost of Proposed Rule	Estimated Revenue	Cost Per Mine	Cost of Rule as % of Revenue
1-19 Employees	223	$4.8 million	$310 million	$21,000	1.54%
1-500 Employees	614	$47.6 million	$11.2 billion	$77,000	0.42%
All mines	624	$51.7 million	$14.1 billion	$83,000	0.37%

As shown in Table V-1, when applying SBA's definition of a small mine, the estimated yearly cost of the proposed rule for underground coal mines with 1-500 employees is approximately $47.6 million, or approximately $78,000 per mine. This is equal to approximately 0.42 percent of annual revenue. Since the yearly cost of the proposed rule is less than one percent of annual revenue for underground coal mines with 1-500 employees, MSHA has certified that the proposed rule would not have a significant impact on a substantial number of small mining entities, as defined by SBA. The Agency has provided in the tables in Chapter IV of this PREA the costs of the proposed rule on this category of mines.

As shown in Table V-1, the estimated yearly cost of the proposed rule for underground coal mines with 1-19 employees is approximately $4.8 million, or approximately $22,000 per mine. This is equal to approximately 1.54 percent of annual revenue for underground coal mines with 1-19 employees. The Agency has provided in the tables in Chapter IV of this PREA the costs of the proposed rule on this category of mines. MSHA estimates that some mines might experience costs somewhat higher than the average per mine in its size category while others might experience lower costs. Even though the

[8] U.S. DOE, EIA, "Annual Coal Report 2006," Table 28, October 2007.

analysis reflects a range of impacts for different mine sizes, from 0.42 percent to 1.55 percent, the Agency concludes that this is not a significant economic impact on a substantial number of small mines.

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.). MSHA has determined that the proposed rule would not include any Federal mandate that may result in increased expenditures by State, local, or tribal governments; nor would it increase private sector expenditures by more than $100 million in any one year or significantly or uniquely affect small governments. Accordingly, the Unfunded Mandates Reform Act of 1995 requires no further agency action or analysis.

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

The proposed rule would have no effect on family well-being or stability, marital commitment, parental rights or authority, or income or poverty of families and children. Accordingly, § 654 of the Treasury and General Government Appropriations Act of 1999 (5 U.S.C. § 601 note) requires no further agency action, analysis, or assessment.

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

The proposed rule would not implement a policy with takings implications. Accordingly, Executive Order 12630 requires no further agency action or analysis.

EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM

The 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, the proposed rule meets the applicable standards provided in § 3 of Executive Order 12988.

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

The proposed rule would have no adverse impact on children. Accordingly, Executive Order 13045 requires no further agency action or analysis.

EXECUTIVE ORDER 13132: FEDERALISM

The proposed rule would not have "federalism implications" because it would 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." Accordingly, Executive Order 13132 requires no further agency action or analysis.

EXECUTIVE ORDER 13175: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

The 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, Executive Order 13175 requires no further agency action or analysis.

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

The proposed rule has been reviewed for its impact on the supply, distribution, and use of energy because it applies to the coal mining industry. Insofar as the proposed rule would result in yearly costs of approximately $51.8 million to the underground coal mining industry, relative to annual revenues of $14.1 billion in 2007, it is not a "significant energy action" because it is not "likely to have a significant adverse effect on the supply, distribution, or use of energy * * * (including a shortfall in supply, price increases, and increased use of foreign supplies)." Accordingly, E.O. 13211 requires no further Agency action or analysis.

EXECUTIVE ORDER 13272: PROPER CONSIDERATION OF SMALL ENTITIES IN AGENCY RULEMAKING

MSHA has reviewed the proposed rule to assess and take appropriate account of its potential impact on small businesses, small governmental jurisdictions, and small organizations. MSHA has determined and certified that the proposed rule would not have a significant economic impact on a substantial number of small entities.

VII. PAPERWORK REDUCTION ACT OF 1995

INTRODUCTION

This chapter shows the estimated paperwork burden hours and related costs to mine operators and manufacturers under the proposed rule. This chapter provides estimates of the burden hours and related costs in proposed §§ 14.4, 75.350, 75.371, 75.1103-5, and 75.1103-8, and existing §§ 75.370.

SUMMARY OF PAPERWORK BURDEN HOURS AND RELATED COSTS

Table VII-1 shows that, in the first year that the rule would be in effect, mine operators would incur approximately 3,300 burden hours with related costs of approximately $240,000. Table VII-2 shows that, annually starting in the second year that the rule would be in effect, mine operators would incur approximately 2,400 burden hours with related costs of approximately $190,000.

Table VII-1: Summary of First-Year Burden Hours and First-Year Costs for the Proposed Rule

Proposed Provisions	Total First-Year Burden Hours	Total First-Year Cost
§ 75.350(a)(2)	105	$7,470
§ 75.350(b)	56	$4,357
§ 75.350(b)(7)	7	$479
§ 75.350(b)(8)	2	$112
§ 75.370(a)(3) & (f)	172	$4,536
§ 75.371(yy)	15	$1,043
§ 75.371(zz)	204	$14,606
§ 75.1103-5(a)	168	$11,483
§ 75.1103-5(a)(2)(ii)	719	$35,950
§ 75.1103-8(b)	519	$44,187
§ 75.1103-8(c)	1,352	$115,109
Total	3,319	$239,331

Table VII-2: Summary of Annual Burden Hours and Annual Costs for the Proposed Rule

Proposed Provisions	Total Annual Burden Hours	Total Annual Cost
§ 75.1103-5(a)(2)(ii)	479	$23,950
§ 75.1103-8(b)	519	$44,187
§ 75.1103-8(c)	1,352	$115,109
Total	2,350	$183,246

As shown in Table VII-3, MSHA estimates that conveyor belt manufacturers would incur burden hours and related cost of: approximately 540 burden hours and related cost of approximately $27,000 in the first year that the rule would be in effect; approximately 270 burden hours and related cost of approximately $13,500 in the second year that the rule would be in effect; and approximately 170 burden hours and related cost of approximately $8,500 in the third year that the rule would be in effect.

Table VII-3: Summary of Burden Hours and Related Cost of the Proposed Rule for Conveyor Belt Manufacturers

Provision	Burden Hours			Burden Cost		
	First Year	Second Year	Third Year	First Year	Second Year	Third Year
§ 14.4	540	270	170	$27,000	$13,500	$8,500
Total	540	270	170	$27,000	$13,500	$8,500

VIII. REFERENCES

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