UPDATED PRELIMINARY REGULATORY IMPACT ANALYSIS

AND

REGULATORY FLEXIBILITY ANALYSIS

PROPOSED RULE ON 30 CFR PART 14

AND

30 CFR §§ 75.1108 AND 75.1108-1

RIN 1219-AA92

PROPOSED REQUIREMENTS FOR THE APPROVAL OF

FLAME-RESISTANT CONVEYOR BELT RULE

Office of Standards, Regulations, and Variance

Mine Safety and Health Administration

United States (U.S.) Department of Labor

December 1999

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

I. EXECUTIVE SUMMARY

INTRODUCTION

In 1992 the Mine Safety and Health Administration (MSHA) proposed new procedures to test and approve flame-resistant conveyor belts for use in underground coal mines. The proposed rule would be codified as Part 14 of Title 30 of the Code of Federal Regulations (30 CFR) and would also include revisions to existing §§ 75.1108 and 75.1108-1 that would establish requirements for the introduction and use of conveyor belts meeting the revised flame test.

MSHA has updated its original Preliminary Regulatory Impact and Regulatory Flexibility Analysis (PRIA) of the proposed conveyor belt rule to allow analysis of the most current data on conveyor belt manufacture, cost, and use and to address several mandates that were not in existence when the original PRIA was completed in 1992. These legislative mandates and Executive Orders require MSHA to evaluate the impact of regulatory action on small mines and manufacturers and on state and local governments.

Executive Order (E.O.) 12866 requires that regulatory agencies complete a Regulatory Economic Analysis (REA) for any rule having major economic consequences for the national economy, an individual industry, a geographical region, or a level of government. The Regulatory Flexibility Act (RFA) similarly

requires regulatory agencies to consider the impact of the rule on small entities. This REA and Regulatory Flexibility Certification has been prepared to fulfill the requirements of E.O. 12866 and the RFA. The Mine Safety and Health Administration (MSHA) certifies that this proposed rule would not impose a significant economic impact on a substantial number of small entities.

This MSHA proposed rule would implement new procedures and requirements for the approval of flame-resistant conveyor belt used in underground coal mines. The proposed rule would replace the existing flame test for the acceptance of flame-resistant conveyor belt specified in 30 CFR § 18.65. Some underground coal mine fires have involved belts that had passed the current small-scale test. In studies conducted by the U.S. Bureau of Mines in conjunction with MSHA, some of these same conveyor belts readily propagated flame and were completely consumed by fire in large-scale flammability tests that were more representative of the mining environment.[1] The proposed rule also would revise and add terminology which applies to conveyor belts or to their approval under this rule.

One year after the effective date of proposed part 14, conveyor belts purchased by mine operators for use in underground

[1]The U.S. Bureau of Mines' functions involving safety and health research, including flammability of products used in mining, were transferred to the National Institute of Occupational Safety and Health (NIOSH) in 1997.

coal mines would have to pass the proposed part 14 flame test. This requirement would allow conveyor belt manufacturers time to formulate and produce commercial quantities of belts that pass the new test and permit underground coal mine operators to replace existing belts as they wear out with belts meeting the part 14 flame test.

BENEFITS

From 1970 through 1997, 344 underground coal mine fires were reported and investigated by MSHA. Of these 344 fires, 51 involved conveyor belt that had burned as much as 2,000 feet before the fire was extinguished. In two cases, the mine had to be sealed to put out the fire. In two of the fires, miners suffered a heart attack while fighting the fire. In one case, the heart attack was fatal. In another fire, five miners were hospitalized and treated for smoke inhalation.

When belt fires propagate, they produce fire gases and can spread faster than the fires of surrounding coal surfaces. Conveyor belt meeting the proposed part 14 flame test would have greater resistance to flame propagation, in addition to being difficult to ignite. Serious risk of fires in the belt entry will be reduced, as would the potential for disaster.

COMPLIANCE COSTS

MSHA estimates the total cost of the proposed rule would be between $7.0 and $15.6 million annually. Of this total, the cost of the proposed rule to underground coal mine operators would be between $6.9 million and $15.5 million annually. Belt manufacturers would incur compliance costs (including increased research and development costs) of approximately $634,000 first year, $83,000 second year, and $33,000 third year and each year thereafter.

EXECUTIVE ORDER 12866 AND REGULATORY FLEXIBILITY ACT

Executive Order (E.O.) 12866 requires that regulatory agencies assess both the costs and benefits of intended regulations. MSHA has fulfilled this requirement for the proposed rule and determined that this rulemaking is not a significant regulatory action.

The Regulatory Flexibility Act (RFA) requires regulatory agencies to consider a rule's economic impact on small entities. Under the RFA, MSHA must use the Small Business Administration's (SBA's) criterion for a small entity in determining a rule's economic impact unless, after consultation with the SBA Office of Advocacy, MSHA establishes an alternative definition for a small mine and publishes that definition in the Federal Register for notice and comment. For the mining industry, SBA defines "small" as a mine with 500 or fewer employees. MSHA traditionally has

considered small mines to be those with fewer than 20 employees. To ensure that the conveyor belt rule conforms with the RFA, MSHA has analyzed the economic impact of the proposed rule on mines with 500 or fewer employees (as well as on those with fewer than 20 employees).

MSHA has determined that this proposed rule would not have a significant economic impact on small mines, whether a small mine is defined as one with 500 or fewer miners or one with fewer than 20 miners. Using the Agency's traditional definition of a small mine, which is one employing fewer than 20 miners, the maximum estimated cost of this proposed rule on small underground coal mines would be about $1.7 million annually, as compared to estimated annual revenue of approximately $292 million. Using the SBA definition for a small mine of 500 employees or fewer, the maximum estimated cost of this proposed rule on small underground coal mines would be about $15.0 million annually, as compared to estimated annual revenue of approximately $7.2 billion.

MSHA has also evaluated the economic impact of the proposed rule on small manufacturers of conveyor belt for underground coal mines (which SBA has defined, for this industry, as those with 500 or fewer employees). For these conveyor belt manufacturers, the annualized cost of the proposed rule would be approximately $119,000, as compared to annual revenues between $71 million and $80 million after the proposed rule is implemented.

Based on its analysis, MSHA has determined that the proposed rule would not have a significant economic impact on a substantial number of small mines, specifically the 972 underground coal mines which are considered to be small mines according to SBA's definition. MSHA has further determined that the proposed rule would not have a significant economic impact on a substantial number of small manufacturers of conveyor belt for underground coal mines. MSHA has so certified these findings to the Small Business Administration. The factual basis for this certification is discussed in Part V of this document.

II. INDUSTRY PROFILE

INTRODUCTION

The industry profile provides background information describing the structure and economic characteristics of the coal mining industry. This profile provides data on the number of mines, their size, the number of employees in each segment, as well as selected market characteristics. Also, general information on the types and number of conveyor belts used in underground coal mines is presented.

Although this particular rulemaking does not apply to the surface coal sector, information about surface coal mines is introduced here in order to provide context for the discussion of underground mining.

OVERALL STRUCTURE OF THE MINING INDUSTRY

MSHA divides the mining industry into two major segments based on commodity: (1) the coal mining industry, and (2) the metal and nonmetal (M&NM) mining industry. These major industry segments are further divided based on type of operation (underground mines, surface mines, and independent mills, plants, shops, and yards). MSHA maintains its own data on mine type, size, and employment. MSHA also collects data on the number of contractors and contractor employees by major industry segment.

MSHA categorizes mines as to size based on employment. For this updated Preliminary Regulatory Impact Analysis (PRIA), MSHA defines small mines to be those having fewer than 20 employees and large mines to be those having 20 or more employees. Over the past 20 years, for rulemaking purposes, MSHA has consistently used this small mine definition. However, for the purposes of the Regulatory Flexibility Act, MSHA has used the SBA definition of a small mine and evaluated the impact of the proposed rule on mines with 500 or fewer employees.

Table II-1 presents the number of small and large coal mines and the corresponding number of miners, excluding contractors, by major industry segment and mine type. This table provides MSHA data for the following three mine-size categories: mines that employ fewer than 20 miners, those that employ between 20 to 500 miners, and those that employ more than 500 miners. The last two categories can be summed to obtain information for those mines that have 20 or more employees. The first two categories can be summed to arrive at information for those mines with 500 or fewer employees. Table II-2 provides the same type of MSHA data about the number of independent contractors as was provided in Table II-1 for miners.

Table II-1: Distribution of Operations and Employment (Excluding Contractors) by Mine Type, Commodity, and Size

COAL TYPE	Size of Coal Mine						TOTAL	
	Fewer than 20 Employees		20 to 500* Employees		Over 500* Employees			
	# of Mines	# of Miners	# of Mines	# of Miners	# of Mines	# of Miners	# of Mines	# of Miners
Underground	436	4,473	536	41,003	9	5,196	981	50,672
Surface	782	4,737	368	27,339	2	896	1,152	32,972
Shp/Yrd/Mill /Plnt**	399	2,519	129	5,049	--	--	528	7,568
Sub-Total	1,617	11,729	1,033	73,391	11	6,092	2,661	91,212
Office Workers	--	654	--	4,094	--	364	--	5,112
TOTAL COAL	1,617	12,383	1,033	77,485	11	6,456	2,661	96,324

(*) Based on MSHA's traditional definition, large mines include those with 20 or more employees.

(**) Shop, yard, mill, and plant are considered surface mines.

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on final 1996 MIS data (quarter 1 - quarter 4, 1996). Data for total office workers from Mine Injury and Worktime Quarterly (Final, January - December 1996) Table 1, p. 5. For mines that employ 500 or fewer, office workers are estimated assuming the same ratios as for non-office workers.

Table II-2: Distribution of Contractors (Contr.) and Contractor Employees (Miners) by Major Industry Segment and Size of Operation

COAL TYPE	Size of Coal Mine						TOTAL	
	Fewer than 20 Employees		20 to 500* Employees		Over 500* Employees			
	# Contr	# Miners	# Contr	# Miners	# Contr	# Miners	# Contr	# Miners
Other than Office Workers	3,684	14,325	301	13,171	2	631	3,987	28,127
Office Workers	--	949	--	872	--	179	--	2,000
TOTAL COAL	3,684	15,274	301	14,043	2	810	3,987	30,127

(*) Based on MSHA's traditional definition, large mines include those with 20 or more employees.

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on final 1996 MIS data (quarter 1 - quarter 4, 1996). Data for total office workers from Mine Injury and Worktime Quarterly (Final, January - December 1996) Table 1, p. 5. For mines that employ 500 or fewer, office workers are estimated assuming the same ratios as for non-office workers.

STRUCTURE OF THE COAL MINING INDUSTRY

MSHA separates the U.S. coal mining industry into two major commodity groups, bituminous and anthracite. The bituminous group also includes the mining of subbituminous coal and lignite. Bituminous operations represent over 93 percent of coal mining operations, employ over 98 percent of coal miners, and account for over 99 percent of coal production. About 60 percent of the bituminous operations are small whereas about 90 percent of the anthracite operations are small.

Underground bituminous mines are more mechanized than anthracite mines in that many underground anthracite mines still hand-load. Over 95 percent of the underground bituminous mines use continuous mining or a combination of continuous and longwall mining methods. The remaining use drills, cutters, and scoops. Almost all underground coal mines use electrical powered equipment, and a growing number of underground coal mines use diesel powered equipment.

Surface mining methods include drilling, blasting, and hauling and are similar for all commodity types. Most surface mines use front-end loaders and shovels to load the coal on trucks for coal haulage.

Final data for 1996, as shown in Table II-1, indicate there are 2,661 active coal mines, of which under MSHA’s traditional definition, 1,617 are small mines (61 percent of the total) and

1,044 are large mines (39 percent of the total).[2] These data indicate total employment in underground coal mines is 96,324, of which 12,383 (13 percent of the total) work in small underground mines and 83,941 (87 percent of the total) work in large underground mines.[3] MSHA estimates that average employment is about 10 miners at small underground coal mines and about 85 miners at large underground coal mines.

ECONOMIC CHARACTERISTICS OF THE COAL MINING INDUSTRY

The U.S. Department of Energy, Energy Information Administration, reported that the U.S. coal industry produced a record 1.06 billion tons of coal in 1996 with a value of approximately $20 billion. Of the several different types of coal commodities, bituminous and subbituminous coal accounts for 91 percent of all coal production (about 971 million tons). The remainder of U.S. coal production is lignite (88 million tons) and anthracite (5 million tons). Although anthracite offers superior burning qualities, it contributes only a small and diminishing share of total coal production. Less than 0.5 percent of U.S. coal production in 1996 was anthracite.[4]

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[2]U.S. Department of Labor, Mine Safety and Health Administration, Division of Mining Information Systems. Final 1996 MIS Data.

[3]U.S. Department of Labor, Mine Safety and Health Administration, Division of Mining Information Systems. Final 1996 MIS Data.

[4]U.S. Department of Energy, Energy Information Administration, July 1998, p.191.

Mines east of the Mississippi accounted for about 53 percent of 1996 U.S. coal production. For the period 1949 through 1996, coal production east of the Mississippi River fluctuated from a low of 395 million tons in 1954 to 630 million tons in 1990. During this same period, however, coal production west of the Mississippi increased each year from a low of 20 million tons in 1959 to a record 500 million tons in 1996.[5] The growth in western coal is due in part to environmental concerns that led to increased demand for low-sulfur coal, which is concentrated in the West. In addition, surface mining which is more prevalent in the West, has increased in productivity due to the technological developments of oversized power shovels, haulage trucks, and drag-lines.

The 1996 estimate of the average value of coal at the point of production was about $19 per ton for bituminous coal and lignite and $37 per ton for anthracite.[6] The value per ton for all coal production in 1996 was also about $19 because anthracite contributes such a small amount to total production that the higher value per ton of anthracite does not greatly impact the average value. In 1996, the total value of production from all coal mines, both underground and surface, was approximately $20

[5]U.S. Department of Energy, Energy Information Administration, July 1998, p.191.

[6]U.S. Department of Energy, Energy Information Administration, July 1998, p.203.

billion, of which about $0.8 billion was produced by small mines and $19.2 billion was produced by large mines.[7]

Coal is used for several purposes, including the production of electricity. The predominant consumer of U.S. coal is the electric utility industry, which used 921 million tons of coal in 1996, or 87 percent of the coal produced. Other coal consumers include coke plants (29 million tons), residential and commercial consumption (6 million tons), and miscellaneous other industrial uses (70 million tons). This last category includes the use of coal products in the manufacturing of other products, such as plastics, dyes, drugs, explosives, solvents, refrigerants, and fertilizers.[8]

The U.S. coal industry enjoys a fairly constant domestic demand due to electric utility usage of coal. MSHA does not expect a substantial change in coal demand by utilities in the near future because of the high conversion costs of changing a fuel source in the electric utility industry. Energy experts predict that coal will continue to be the dominant fuel source of choice for power plants built in the future.[9]

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[7]U.S. Department of Labor, Mine Safety and Health Administration, Division of Mining Information Systems. Final 1996 MIS Data.

[8]U.S. Department of Energy, Energy Information Administration, July 1998, p. 187.

[9]Department of Energy, Energy Information Administration, January 1996, p. 56.

CONVEYOR BELTS IN UNDERGROUND COAL MINES

There are 74 firms or subsidiaries of firms that hold MSHA acceptances for conveyor belts under 30 CFR 18. Twenty-six of these firms are headquartered in foreign countries. Some firms whose belts have been approved may no longer manufacture and/or sell conveyor belts for use in underground mines. On the basis of MSHA's current information, most or all of the plants presently producing conveyor belts for the underground coal mining industry are small entities insofar as they employ 500 or fewer workers.

Conveyor belts are of two general types: (1) synthetic rubber and (2) polyvinyl chloride, or PVC. MSHA estimates that synthetic rubber belts currently comprise between 80 and 85 percent of the underground coal market, while PVC belts account for the balance.

There are several kinds of synthetic rubber belts; most contain polymers of either styrene butadiene rubber (SBR), chloroprene (neoprene), or a blend of SBR and neoprene. A synthetic rubber belt is composed of the rubber polymer, one or more flame retardants, plasticizers for flexibility, one or more layers or plies of woven fabric (the carcass), and various chemical additives. Some of the heavier mainline belts have steel cords or Kevlar® for added strength. A PVC belt is generally composed of the PVC resin, a single solid woven carcass

(i.e., one ply), a plasticizer, flame retardants, and other chemical additives.

Conveyor belt systems are used extensively in underground mines to transport mined material. Conveyor belt widths typically range in 6-inch increments from 30 inches to 72 inches. A section belt is generally 36 inches wide, although both 30-inch and 42-inch belts are not uncommon. Mainline belts can be the same size as the section belts that dump coal onto them, especially in small, one-section mines. In larger mines, however, mainline belts are wider, usually 48 inches wide or wider. Many mines using longwall equipment have even wider section and mainline belts to accommodate high production rates.

Belt strength is measured in pounds per square inch of width, or piw. In general, the heavier and thicker the belt, the higher the piw. Belts range in strength from 220 to 1200 piw. The maximum thickness of a PVC belt is about 3/4 of an inch, while the maximum thickness of a rubber belt is about 1½ inches. Factors such as construction and flame-resistant ingredients can be more important than the thickness, however, in determining a belt's ability to pass the flame test. During developmental tests, both thick and thin belts have passed, and both thick and thin belts have failed.

Belt lengths also vary; a belt may extend a few hundred feet or it may be more than a mile long. Based on data collected by MSHA, there are about 6,000 feet of conveyor belt (covering 3,000

feet of distance each for conveyance and return) in an average small underground mine and 40,000 feet of conveyor belt (covering both conveyance and return) in an average large underground mine.[10] Based on these estimates and the numbers of mines in each size category, conveyor belts cover about 2,300 miles of distance, one-way, in underground coal mines.[11]

The life of a conveyor belt depends on many factors. The quality of the belt is important, but so is proper alignment. A belt that is misaligned will wear at the edges. The characteristics of the coal being carried will also affect belt life. Coal that contains large amounts of rock will wear the belt faster than coal that is free of waste materials. Material transported back after the conveyed coal is dumped, unless it is removed, will cause a belt to wear. The quality of the maintenance of the belt and conveyor hardware is also a factor in

[10]In the original 1992 PRIA in support of the proposed flame-resistant conveyor belt rule, MSHA estimated that there were about 3,000 feet of conveyor belt (covering both conveyance and return) in an average small underground coal mine and 28,000 feet of conveyor belt (covering both conveyance and return) in an average large underground coal mine. The explanation for the increase, over time, in the average amount of belting in small mines is that many small mines which did not use conveyor belts previously either have gone out of business or shifted to production technologies that require the addition of conveyor belts. For large mines, the primary explanation is that the average size of large underground coal mines has increased, in part due to new technology and an increase in the length of panels.

[11]Belt length is sometimes reported as one-way distance into an underground coal mine and sometimes as the distance for both conveyance and return. When the belt length is reported in miles, we follow the convention of referring to one-way distance. Unless otherwise specified, in all other cases, belt length reported in this updated PRIA will refer to conveyance and return. We note also that belt length is sometimes measured in meters rather than feet and that belt width is sometimes measured in centimeters rather than inches. One foot equals 0.3048 meters. One inch equals 2.54 centimeters. One mile equals 5280 feet or 1.6093 kilometers.

belt wear. Idlers upon which the belts ride must run smoothly or friction will be created, causing wear to the belt. Belt transfer points must also be maintained, since coal can collect around the rollers and drums, abrading the belting. Finally, the hours per day that a belt is used will also affect its life.

As the sections and entries advance or retreat, greater or lesser lengths of belt are needed. Two methods are available to change the length of the belt. Mechanical fasteners can be used to splice the belt quickly. This is common on section belt, which needs to be spliced frequently. The second method is vulcanization. This process takes longer and requires special equipment and more skill than is required to splice with metal fasteners. This option often relies on contractors that specialize in vulcanizing. The quality of workmanship in making splices can also affect a belt's wearability.

As discussed in more detail in Chapter IV, MSHA estimates that a section belt has an average life of between five and six years. Section belts are spliced as the section advances and are commonly moved from section to section. Mainline belts, which are rarely moved and are spliced less frequently, have an average life of between six and seven years. These estimates take into account normal operations, rather than ideal conditions, where the belts are properly installed and maintained and carry coal that does not contain foreign materials that might prematurely damage the belt. Besides the quality of the conveyor belt

itself, its life depends primarily on three factors: 1) proper installation and maintenance of the belt system; 2) maintenance at the transfer point (including cleanup and alignment); and 3) the amount of belt-damaging foreign material such as rock that is carried by the belt.

III. BENEFITS

INTRODUCTION

The Mine Safety and Health Administration (MSHA) has evaluated the potential benefits from the anticipated reduction in the number of conveyor belt fires because of the use of improved flame-resistant conveyor belt. The expected reduction in these mine fires will minimize fatalities and injuries as well as provide monetary savings that result from the cost of fire fighting, production losses, and the loss of jobs.

NUMBER OF REPORTABLE MINE FIRES INVOLVING CONVEYOR BELTS

MSHA requires mine operators to report mine fires that last more than 30 minutes or involve an injury or fatality. Table III-1 provides data for the years 1970 through 1997, during which time 344 fires in underground coal mines were reported and investigated by MSHA. Of these 344 fires, 51 were identified as being initiated in the belt entry and involved conveyor belt. Fires which occurred in the belt entry, but did not involve conveyor belting, and fires which extended into the belt entry, such as the Wilberg fire of December 19, 1984, were not included in the 51 belt fires listed in Table III-1. As this table shows, the 51 belt fires represent approximately 15 percent of the total number of fires over this 28-year period. Approximately 60

percent of this total number of belt fires has occurred over the past 15 years.

TABLE III-1: TOTAL NUMBER OF REPORTABLE FIRES AND NUMBER OF THOSE FIRES INVOLVING CONVEYOR BELTS 1970-1997[a,b,c,d]

Years	Total Fires	Number of Belt Fires	Percent of Total Fires
1970	36	5	13.9
1971-1973	53	2	3.8
1974-1976	39	2	5.1
1977-1979	30	5	16.7
1980-1982	45	7	15.6
1983-1985	39	9	23.1
1986-1988	51	10	19.6
1989-1990	14	2	14.2
1991-1992	16	5	31.3
1993-1994	10	2	20.0
1995-1996	9	1	11.1
1997	2	1	50.0
Total	344	51	14.8

[a]DOL/MSHA, Washington, D.C., 1989.

[b]S. Luzik and L. Desautels, November 19, 1990.

[c]S. Luzik, October 31, 1991.

[d]H. C. Verakis & M. Schwartz, 1998

HAZARDS OF CONVEYOR BELT FIRES

No coal mine using conveyor belt haulage is immune from a fire involving the conveyor belt, and according to MSHA data, nearly all underground coal mines use conveyor belts to transport coal. Conveyor belt fires, which jeopardize the lives of personnel working in the mines and persons participating in rescue and recovery work, are an ever-present hazard in underground coal mines. Aside from the fire itself, the toxic products of combustion contaminate the air, threaten the health of individuals exposed to such products, and hinder or block evacuation and escape from the mine.

The most common hazards in connection with conveyor belt fires are: (1) the toxic effects of fumes, such as carbon monoxide (CO), 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 fire area or mine is being sealed; and (4) ignition and/or explosion of a flammable gas or coal dust atmosphere.

Once ignited, conveyor belts can readily transport flame over vast distances, igniting other combustibles in the mine entry. When belt fires reach the propagation state, they produce more fire gases and spread faster than the fires of surrounding coal surfaces. As a fire spreads out of control, normal mine ventilation can be disrupted, which introduces a threat of

explosion from the accumulation of methane and release of flammable gases. For example, mine rescue teams fighting a conveyor belt fire at the Marianna Mine were withdrawn because high levels of methane accumulated, posing the threat of explosion.

Since 1970, two heart attacks, one of which was fatal, have occurred while fighting conveyor fires. In another conveyor fire, miners suffered smoke inhalation. In a third fire, another five miners were treated for smoke inhalation. Conveyor belt fires represent a potential for disaster with large loss of life. Reports of investigations of conveyor entry fires document the fact that conveyor belts meeting the existing MSHA standard for flame resistance (30 CFR 18.65), once ignited, will burn and propagate fire for great distances under conditions that exist in underground coal mines. The conveyor belt is the principal fuel for flame propagation in the conveyor 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. Under large-scale fire gallery tests which were more representative of the mining environment than the current test, conveyor belts which passed the current part 18 test exhibited flame propagation rates as high as 30 feet per minute. Some of the tested belts exhibited "flashover" rates (very high rates of flame propagation) up to 45 feet per minute.

Due to the danger of this rapid flame propagation, the currently approved conveyor belt, which forms a continuous filament of combustible material extending the length of the mine entry, is the single greatest fire hazard in the conveyor entry. However, the severity of mine fires originating in conveyor entries, with the associated threat to life and the disastrous economic impact on individuals, the community, and the state, can be reduced by requiring conveyor belts that pass the proposed part 14 flame test.

DESCRIPTION OF CONVEYOR BELT APPROVALS

Currently, in order to be approved for use in underground coal mines, conveyor belts must pass a small-scale flame test specified in 30 CFR 18.65. This test assesses a conveyor belt's resistance to ignition from a small gas flame but does not assess its resistance to flame propagation. Thus, conveyor belts accepted under the 30 CFR 18.65 test, once ignited, can and have propagated flame along the length of the belt. The new laboratory-scale test (proposed part 14) addresses the resistance of conveyor belt to ignition and flame propagation. It is designed to eliminate the hazard of flame propagation along the belt so that conveyor belts passing the proposed part 14 flame test will be resistant not only to ignition, but will also be highly resistant to flame propagation.

Use of conveyor belts meeting the proposed part 14 flame test will not only reduce the hazard of fire propagation, but will also reduce the production of toxic products of combustion if the burning belt is involved in a fire with other combustibles. Although the levels of CO and other toxic compounds generated from a burning conveyor belt depend on the formulation and conditions of combustion, use of conveyor belts with improved flame resistance (i.e., meeting the proposed part 14 flame test) will reduce the potential for flame spread, and in doing so, also reduce the potential for a serious toxic hazard. The use of these improved fire resistant belts should significantly reduce the serious risk of belt fires as well as virtually eliminate propagation of fires in conveyor belt entries.

DESCRIPTION OF SPECIFIC CONVEYOR BELT FIRES

Beatrice Mine Fire

On November 25, 1981, a conveyor belt caught fire on the longwall panel in Beatrice Mine, Buchanan County, Virginia. MSHA investigators assumed that the fire originated at the dolly car, a part of the belt take-up that serves as a belt storage system. A small flame ignited combustible material which, in turn, ignited the belt, and about 2,000 feet of belt burned. The fire became so intense that rubber gaskets at the joints of the high

pressure water line along the conveyor belt melted, causing a lack of water pressure and preventing the use of water to fight the fire. The use of chemical fire extinguishers and rock dust proved ineffective in preventing the spread of the fire, and the mine had to be sealed.

Sealing operations included covering the intake shafts with plywood, plastic, and concrete over steel rails. The return shafts were sealed with plywood and rigid foam. Later, two vertical holes (2,300 feet deep and cased with steel pipes) were drilled into the fire area to insert liquid nitrogen. Over a period of a month, 18.6 million cubic feet of nitrogen was pumped into the fire area to starve the fire of oxygen.

After it was shown that the fire was out and the underground atmosphere had begun to stabilize, plans were made to reopen the mine. The seals were removed, fans were started, and the mine atmosphere was monitored until it was determined that it was safe for mine rescue teams to examine the mine. Rehabilitation work consisting of pumping, rockdusting, timbering, and checking for methane was then conducted. On March 29, 1982, coal production resumed on a limited basis.

The mine was closed for 124 days. The 380 underground miners were assigned to other mines that the company owned during the time the Beatrice mine was closed. At the time of the fire, Beatrice Mine produced 3,500 tons of coal per day and, based on a five-day week, lost production during the fire was about 315,000

tons of coal. At the 1981 price of $26 per ton of coal, this mine lost about $8.2 million in revenue.

In addition to the lost revenue, the owners incurred substantial expenses as a result of the fire. These expenses included the cost of materials and labor to seal the mine; the cost of drilling holes into the fire area and injecting nitrogen into those holes; the cost of preparing the mine for reopening, such as removing the seals and clearing the mine of dangerous gases; and the cost to rehabilitate, where possible, the areas damaged in the fire. The 380 underground miners were assigned to other mines that the company owned during the time the mine was closed.

MSHA also incurred costs in investigating the fire and providing assistance to the mine. Several MSHA personnel were present at various times throughout the 124 days the mine was closed. The cost to MSHA of direct logistics support services was $64,000.

Shoemaker Mine Fire

On January 4, 1986, a belt fire occurred in the Shoemaker Mine, Marshall County, West Virginia. The fire originated at a track entry overcast. An insulated hanger for the trolley wire failed, and electric current traveled through it into the metal overcast. Heat generated by the electric current passing through

the metal overcast ignited combustible material in the belt conveyor entry which ran through the overcast above the track entry.

The fire traveled along approximately 180 feet of belt before it was extinguished several hours later. The burning belt ignited wooden crib blocks, posts, and planks; however, the roof and ribs did not burn.

The section that the belt served did not resume production for about a week after the fire. Other sections that were not affected by the fire were able to resume production immediately. Lost production, therefore, was relatively minor. This fire demonstrates, however, that conveyor belt that meets current MSHA standards, once ignited, can propagate flame without having a continuing fire source, such as coal or coal dust.

Florence No. 1 Mine Fire

On November 27, 1986, at about 2:00 a.m., a conveyor belt caught fire at the Florence No. 1 Mine, Indiana County, Pennsylvania. Due to the Thanksgiving holiday, the mine was idle that day, and only two section foremen and one pumpman were present at the mine.

A defective bottom roller on the tight side of the belt entry, combined with an accumulation of coal dust, caused the fire. The fire was discovered by the two foremen. One foreman

advanced inby spraying water on the fire while the other foreman and the pumpman built a check curtain to reduce the air velocity in the belt entry. 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 pumpman 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. He was removed from the mine, and for more than an hour no one was in the mine to fight the fire.

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 was instrumental in stopping the fire. By 10:30 p.m. the same day, the fire had been extinguished.

The fire occurred in a sandstone fault area of the mine. Although there was coal dust at the point of origin of the fire, the entry was mostly noncombustible sandstone. Once the fire started, therefore, the belt, rather than other combustibles such as coal, was the sole source for propagating the flame. Had the fire occurred in a coal seam rather than in a fault area, the fire would have involved the coal and been more severe.

The mine was in a nonproducing status for about a week. Miners went underground during that time to perform maintenance, install new belt, and rehabilitate damaged areas. Florence No.

1, Robinson Portal mine was producing 3,200 tons per day and employed 317 miners who worked underground at the time of the fire. At a 1986 price of $24 per ton of coal, about $384,000 in revenue was lost. Blacklick Mine, which is connected to Florence No. 1, also lost production during that time, but MSHA does not have an estimate of this loss.

Marianna Mine Fire

On March 7, 1988, a fire started at a belt drive in the Marianna Mine, 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. 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 three of these sections were inby the fire and miners had to evacuate through heavy smoke. One entire crew of miners was in grave danger when they became disoriented in the smoke and traveled farther into the mine before finding their way out. Five of the miners were sent to a hospital for treatment of smoke

inhalation.

Firefighting activities continued after the evacuation of the sections. Foam, water, and rock dust were used, but the belt fire continued to spread. Levels of combustible gases reached 10 percent in one of the returns. About 23 hours after the fire was discovered, all personnel were withdrawn from underground, and plans were made to flood the area of the mine where the fire was located.

Several boreholes were drilled from the surface into the fire area. Water was pumped into one borehole and limestone, cement, and polyurethane were pumped into others to serve as dams to contain the water. When this proved unsuccessful, a second plan was formulated to use the dams as air seals. This plan also proved unsuccessful.

A month after the fire began, mine rescue teams reentered the mine to examine the seals. Smoke, roof and rib sloughage, water, and several roof falls were encountered. The mine was then sealed and remains sealed today. MSHA knows of no plans to try to reopen the mine. Of the 327 employees at the Marianna mine site, only a few are still employed in mining.

At the time of the fire, Marianna Mine had been producing 4,159 tons of coal per day on two coal-producing shifts, five days per week. At the 1988 price of $22 per ton of coal, the annual lost revenue was first estimated, for the original 1992 PRIA, to be about $23.8 million. Revenue will continue to be

lost as the mine remains closed, up to the productive capacity of the mine.

POTENTIAL BENEFITS FROM FLAME-RESISTANT CONVEYOR BELT

A mine fire can affect not only the mine operators and miners, but also the entire local community. Persons living in the area of the mine may have to be evacuated due to the smoke and toxic fumes escaping to the surface from a mine fire. The evacuated persons may be kept from returning to their homes or place of work for several days until officials consider it safe to return. The Marianna Water Company's pump plant was shut down for three days because of its proximity to a mine supply shaft and the danger of combustible gases being present from the Marianna Mine fire. The use of water in the Marianna community was restricted for about a week as a result of the shutdown of this pump plant.

Frequently, fire-fighting duties must be shared by others in addition to a mine's rescue team. Rescue teams from other area mines and local fire departments are often called upon to contribute to the fire-fighting effort and, thus, are exposed to the mine fire hazards. Other rescue teams and fire departments must provide backup coverage for the units responding to the mine fire. Also, drilling crews may be needed to drill boreholes from the surface into the underground mine passageways to monitor a fire and to attempt to extinguish or seal a fire by injection of

fire-fighting materials. Drilling crews, used to deliver fire-fighting agents such as liquified carbon dioxide or nitrogen and instruments through boreholes, can also be exposed to the hazards of smoke and toxic fumes migrating from a fire in the mine to the surface. The use of such agents in an attempt to control a fire requires application over at least several days and can cost over $20,000 a day.

The conveyor belt which contributed to the severity of the Marianna Mine fire was of a type which is still in widespread use in underground coal mines today. Improvement in the flame-resistant properties of conveyor belts used in coal mines will be less costly than rescue and recovery operations conducted as a consequence of a conveyor belt fire. The potential for a disastrous coal mine conveyor belt fire with injuries or loss of lives will be significantly reduced by the use of flame-resistant conveyor belts meeting proposed part 14.

A summary of the costs of conveyor belt fires in terms of lost production is presented in Table III-2. This table presents the revenue losses incurred during the nonproduction period associated with three mine fires since 1980. The propagation of the conveyor belt fire was a significant contributing factor in the severity of each of these three fires. These data reflect only revenue losses from coal nonproduction evaluated at the 1996 price of coal of $19 per ton. The data do not encompass other costs or financial losses incurred by the mine operator or

employees.

TABLE III-2: Summary of Costs of Conveyor Belt Fires in Terms of Lost Production

Mine	Weeks Shutdown	Coal Production/Weeks	Total Lost Production	Price Coal [a]	Total Value of Lost Prod
Beatrice	18	17,500	315,000	$19	$5,985,000
Florence#1[b]	1	16,000	16,000	$19	$304,000
Marianna	520[c]	20,795	10,813,400	$19	$205,454,600

[a]MSHA used the 1996 price of coal to estimate what the value of lost production would be today.

[b]Figures do not reflect losses incurred at Blacklick Mine, which was idled for the same time period.

[c]Mine sealed and continued in non-production status since March 7, 1988. MSHA estimated the mine to have 10 years of productive life remaining at the time of the fire.

The effect and impact of the Marianna Mine fire is an example of the expenses that are incurred in fighting a conveyor belt fire. Personnel and equipment from nearby mines were brought to the mine to fight the fire. Food, lodging, and wages were provided for these personnel by the mine operator. When the rescue teams were withdrawn, all equipment was left in the mine, and mines that loaned the equipment were reimbursed. More than 30 boreholes were drilled in an attempt to form underground seals for controlling the fire by using materials pumped from the surface. This effort required sophisticated high-speed drilling equipment to operate 24 hours a day in normally inaccessible areas. Access rights were purchased from landowners, and

roadways were cleared and built so that drilling equipment could be installed. When a borehole was drilled errant to its intended location (e.g., an intersection), as many as four boreholes had to be drilled before a suitable borehole was obtained at the intended location.

Material was pumped into the mine through the boreholes in an attempt to create underground seals. When this attempt to extinguish the fire failed, the entire mine was sealed. During the 30 days between the discovery of the fire and sealing of the mine, the direct cost of the fire fighting efforts was reported to have been between $5 and $6 million.

Following this effort, the land was reclaimed to its original state, and reimbursement for inconvenience and damage was paid to the landowner by the mine operator.

Other direct costs, not included in this $5 to $6 million amount, would significantly increase the total cost of the Marianna Mine fire. Miners were paid to fight the fire. In addition, miner benefits were maintained for a time following the mine shutdown. Underground mining supplies, equipment, and fire-fighting equipment owned by the mine operator were left underground when personnel were withdrawn. The cost of this abandoned mining equipment alone is in the millions of dollars.

Thus, the costs associated with the occurrence of a conveyor belt fire include the costs of personnel, equipment, and materials for fighting the fire, loss or damage of mining

supplies and equipment underground, repair to fire-damaged areas, and future revenue losses due to the loss of mineable coal reserves caused by the fire.

The loss continues to affect the people in Marianna and the surrounding community. As part of the revenue loss caused by the fire, the closing of the mine has cost the Marianna borough and surrounding township almost half of its water revenues and thousands of dollars yearly in wage taxes.

The impact of the loss of production at one mine, by shutdown or loss of minable reserves, on the workers and community is reflected by information presented in the Pennsylvania Coal Data Book (1990), distributed by the Pennsylvania Coal Association. This publication describes the value of one million tons of coal to Pennsylvania. This tonnage represents the annual output of a medium-sized mine producing approximately 5,000 tons of coal per day. The mining of this coal, valued at $26,780,000, generates 200 direct jobs with a $6,900,000 payroll and 208 indirect jobs with a $4,800,000 payroll. Pennsylvania collects about $250,400 in personal income taxes from these employees, plus business taxes on the operator's profits. About 340 employees lost their employment as a result of the Marianna Mine conveyor belt fire. The effects of this fire included reduced tax revenue for the state, the local community, and county. While the data are specific to Pennsylvania, it is representative of locations throughout the

nation.

These data show that the economic impact of a single mine fire originating in the conveyor belt entry can exceed the total implementation cost of this proposed regulation to the mining industry. In a written statement presented at the MSHA public hearing on Belt Entry Ventilation (April 18, 1990, in Reston, Virginia), the Research Director of the Pittsburgh Research Center, Bureau of Mines stated:

> The most significant part of this testimony is the following: that improved fire-resistant conveyor belts, if used in all mines, would significantly reduce the risk of serious belt fires. All of the other findings and observations relative to the effect of airflow on belt flammability, the relative effectiveness of different fire-sensing systems, etc., are second-order effects compared to the results achieved through the use of improved fire-resistant conveyor belt material.

The United States lags behind most nations in addressing the hazards associated with burning belts. The United States and Japan, which uses the same small-scale test as the United States, have the lowest belt fire resistance requirements in the world. Many of the belts used in U.S. mines will not pass the tests required in Canada, which uses tests similar to the British test, and the countries of Europe, including the Eastern Block Countries. The United Kingdom upgraded its requirements after 80 miners died in a belt-propagated fire that occurred in 1950 at the Creswell Collieries. Germany also increased its requirements

after 7 miners died in a belt fire that occurred in 1978 at the Schlagel Eisen Collieries.

CONCLUSION

Some belt fires in U.S. mines have come perilously close to claiming the lives of entire sections of miners as well as causing extensive property losses that resulted in lost production and unemployment. This proposed rule would reduce the risk of conveyor belt fires, as well as reduce the flame propagation of a burning conveyor belt; property losses would also be reduced. This proposed rule would also bring MSHA's conveyor belt fire resistance requirements up to international standards.

IV. COMPLIANCE COSTS

INTRODUCTION

Belt manufacturers would incur the costs of developing and producing belts that would pass the proposed part 14 flame-resistance test and the costs of submitting the belts to MSHA for testing and approval. Existing § 75.1108-1 would be changed to require acquisition of coveyor belts meeting the proposed part 14 test. The cost of § 75.1108-1 would be incurred by the users of conveyor belts in underground coal mines.

The following discussion addresses each proposed part separately. Compliance costs of proposed 30 CFR 14 are discussed first. Then the compliance costs for acquisition of the belts are presented.

COSTS OF PROPOSED PART 14

Introduction

Current specifications, procedures, and requirements for the acceptance of conveyor belts as flame resistant are found in 30 CFR 18.65. MSHA uses the flame test in § 18.65 to test and evaluate belts submitted for acceptance by applicants.

The proposed rule is based on new flammability test procedures and criteria developed by the U.S. Bureau of Mines in conjunction with MSHA. The proposed rule describes the new laboratory-scale flammability test that MSHA would use in determining whether or not a belt will be approved as flame

resistant. Provisions for acceptance of flame-resistant conveyor belts in 30 CFR 18.65 would be replaced by a new part, proposed 30 CFR 14.

The costs of this proposed rule 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.

Methodology and Assumptions

MSHA estimated the costs to the manufacturers of underground conveyor belts by considering the costs for application fees, materials, and labor. Application fees are those published in the Federal Register for use in 1999. Labor costs for professional and technical personnel are based on discussions with the manufacturers. The average fringe benefits are estimated to be 43 percent of average wages and salaries. The bases for other estimates in this analysis are explained as they are used in the discussion of each section of the proposed rule.

Cost of Compliance Summary

Table IV-1 shows the cost of full compliance with the proposed rule for manufacturers of conveyor belt.

TABLE IV-1: Cost of Compliance for Belt Manufacturers as a Result of the Proposed Rule

Provision	First Year Costs	Second Year Costs	Annual Costs[a]
§ 14.4 Research/Development	$500,000	$0	$0
§ 14.4 Preparation of Applications	$28,380	$16,340	$6,020
§ 14.4 MSHA Fees	$87,585	$54,380	$20,950
§ 14.5 Test Samples	$18,225	$10,800	$4,050
§ 14.8 Quality Assurance	$129	$129	$129
§ 14.10 Audits	$0	$1,620	$1,620
Total	$634,319	$83,269	$32,769

[a]Annual Costs are those incurred in the third and each succeeding year.

SECTION-BY-SECTION COSTS

Subpart A-General Provisions

§ 14.1 Purpose and Effective Date

This section is informational in nature. No costs are associated with this notice.

§ 14.2 Definitions

Terms used in the proposed rule are defined in this section. They are used to clarify the requirements of the proposed rule. There are no costs associated with the definitions.

§ 14.3 Observers at Tests and Evaluations

This section specifies the individuals who are allowed to be present during the tests and evaluations. It is intended to

protect proprietary information of the applicants. No costs are associated with this section.

§ 14.4 Application Procedures and Requirements

This section specifies the procedures an applicant must follow to apply for approval of a conveyor belt under this 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 passing the proposed part 14 flame test will, in many cases, consist of different formulations of polyvinyl chloride (PVC) or rubber than the belts that are accepted by MSHA under the current flame test found in 30 CFR § 18.65. Research and development costs would be incurred by the manufacturers as they attempt to formulate constructions that will pass the proposed part 14 flame test. Some belts that are currently used in underground coal mines will pass the proposed flame test, while other belts that are being used will fail this test.

In the original Preliminary Regulatory Impact Analysis, MSHA estimated that there would be an initial cost of $10,000——and an average cost of $5,000 per belt submitted for original approval——

for research and development to formulate a belt that would pass the proposed flame test and be commercially acceptable to the mining industry. Based on comments submitted by conveyor belt manufacturers in response to the proposed rule and the original PRIA, MSHA expects that research and development costs for a manufacturer could vary from no cost if the manufacturer's belts can already pass the proposed part 14 flame test, to several thousands of dollars if the manufacturer's belts require only minor reformulations to pass the proposed flame test, to more than $100,000 if the manufacturer's belts would have to undergo major reformulations to pass the proposed flame test. Therefore, based on the comments submitted by conveyor belt manufacturers, MSHA now estimates that, on average, there would be an initial $50,000 cost per manufacturer to conduct the research and development to formulate belts that will pass the proposed test and be commercially acceptable to the mining industry. This amount reflects the salaries and benefits to professional and technical personnel who would determine the new formulations, the raw materials to manufacture 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 that are necessary to pass the proposed flame test and that belt manufacturers would not incur additional R&D expenses in excess of those that would have been incurred to reformulate belting periodically under the existing rule. As previously noted, some manufacturers have, in fact, already reformulated belts that have passed the revised flame test. MSHA estimates that there would be about 10 belt manufacturers who would submit approval applications upon implementation of this proposed rule.[12] MSHA therefore estimates the research and development costs for the first year would be about $500,000 ($50,000 per applicant x 10 applicants).

Costs to Prepare the Applications

An application for an original approval of a conveyor belt would have to include technical information about the construction of the belt, such as type of compound used in the covers, thickness of top and bottom covers, carcass construction, and type of fabric used. Formulation information on the compounds in the belt would also have to be specified in the application. Finally, the name, address, and telephone number of the applicant's representative responsible for answering

[12]In 1992, when the original PRIA for the proposed rule was prepared, MSHA estimated that there were some 74 manufacturers of conveyor belt for use in underground coal mines. However, an MSHA investigation conducted in 1998 revealed that there were only 10 conveyor belt manufacturers currently active in the manufacture of conveyor belts for use in underground coal mines.

questions regarding the application would also have to be provided. Less information would be required to be submitted for extensions of approvals of conveyor belts similar to previously-approved belts. (An example of an application for extension of approval is one for approval of a 3-ply belt that has the same formulation as a previously-approved 2-ply belt.)

MSHA estimates that an application for an approval 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. It is expected that an engineer, compensated at $43 per hour, including 43 percent of base salary for benefits, would prepare the applications.[13] The labor cost to prepare an approval application, therefore, would be $215. The cost to prepare an application for approval of a belt similar to a previously-approved belt or an extension of approval would be $86.

In Fiscal Year(FY) 1997 there were 18 new applications submitted for testing and evaluation under § 18.65. The number of new applications for approval under the proposed rule is expected to be substantially greater during the first few years, as manufacturers try to gain approval for new belt constructions. During the first year, MSHA estimates that applicants would

[13]Western Mine Engineering, Inc., 1997

submit 150 belt constructions for testing.[14,15] Of these 150 belts, MSHA estimates that 120 would be for first-time or original approvals, while the remaining 30 would be for approvals of belts either similar to those that had already been approved or for extensions of approval.

The 120 approval applications would require five hours to prepare. The cost to prepare these applications will be $25,800 ($43 per hour x 5 hours per application x 120 applications). The remaining 30 applications would be for approvals or extensions of approvals requiring two hours to prepare. The cost to prepare these applications would be $2,580 ($43 per hour x 2 hours per application x 30 applications).

During the second year, MSHA estimates that 100 applications would be submitted, 60 of them for original approval and 40 for approvals of belts either similar to those already approved or

[14]In a comment on the proposed rule, one conveyor belt manufacturer asserted that it alone would require a minimum of 200 to 300 constructions tested the first year. However, under the proposal, manufacturers would be able to submit "families" of constructions requiring only a single approval, just as they can do currently under part 18. A family would consist of constructions with nearly identical characteristics except for one feature (e.g., the number of plies). Thus, in many cases, manufacturers could submit 10 or 20 constructions requiring only one approval.

[15]In the original 1992 PRIA, MSHA had estimated that the 74 belt manufacturers then in existence would submit approximately 250 belt applications the first year. Since that time, the number of belt manufacturers has decreased, both because some have gone out of business and because some have merged. Based on its 1998 investigation of conveyor belt manufacturers actively manufacturing conveyor belts for mines, MSHA now estimates that there are only about 10 conveyor belt manufacturers who would be likely to submit applications under proposed part 14. MSHA has therefore reduced its estimate of the number of first year applications to 150.

extensions of approvals.[16] The cost to prepare the approval applications would be $12,900 ($43 per hour x 5 hours per application x 60 applications) and the cost to prepare the balance would be $3,440 ($43 per hour x 2 hours per application x 40 applications).

MSHA estimates that 40 applications per year would be submitted in the third and following years.[17] These are expected to be applications for approvals of similar belts or extensions of approvals. The cost to prepare the approval applications would be $4,300 ($43 per hour x 5 hours per application x 20 applications) and the cost to prepare the balance would be $1,720 ($43 per hout x 2 hours x 20 applications).

The total preparation costs, therefore, would be about $28,380 the first year, $16,340 the second year, and $6,020 the third year and each succeeding year.

[16]The estimate of 100 applications per year is less than the 150 applications per year set out in the original 1992 PRIA. It reflects the reduction in the number of belt manufacturers likely to submit applications, according to MSHA's estimates, from 74 to 10.

[17]The estimate of 40 applications per year is less than the 60 applications per year set out in the original 1992 PRIA. It reflects the reduction in the number of belt manufacturers likely to submit applications, according to MSHA's estimates, from 74 to 10.

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 for MSHA's testing and evaluation fees. The fees for testing and evaluation, effective January 1, 1999, are $59 per hour.[18] The costs of evaluation are equal to the hourly fee for testing and evaluation multiplied by a support factor of 1.895. The 1.895 support factor is a mathematical multiplier, derived from MSHA cost data, used to incorporate the overhead costs associated with application approval such as: manager's review of applications and action processing; typing, mailing, and filing of approval documentation; computer services, tracking status, reports generation and distribution; and records control (filing, retrieving, security, and confidentiality).[19]

MSHA's Approval and Certification Center estimates that the conveyor belt flame test would take an average of 3 hours to conduct, or about 1 hour for each of the three samples that would be required to be tested. The original 1992 Preliminary Regulatory Economic Analysis estimated the time to conduct the test to be 6 hours. However, since that time, MSHA has gained much experience conducting the subject tests. The vast majority

[18]"Fee Adjustments for Testing, Evaluation, and Approval of Mining Products," Federal Register, December 18, 1998, Vol. 63, No. 243, pp. 70163-70164.

[19]These costs no longer include a $100 non-refundable application fee since MSHA began waiving this fee for all hourly-rate actions effective January 1, 1996.

of flame tests can be conducted as part of the conveyor belt test program within 3 hours. On rare occasions, a belt test of three samples may take more time if the belt has very poor flame-resistant properties. If the samples create a conflagration, 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 and accompanying documentation for a new approval would take about 4 hours. The original 1992 PRIA indicated that the evaluation time would be 5 hours. Since 1992 when the PRIA was written, the Approval and Certification Center implemented an electronic filing, storing, and processing system that permits an MSHA investigator to acquire, review, and complete an application more quickly and efficiently. MSHA anticipates that the use of this electronic system should decrease the evaluation time from the 5 hours that were estimated in the original PRIA to the 4 hours now stated. For this same reason, the time needed to evaluate an application for an approval of a similar belt or an extension of approval has also been changed to 3 hours from the original estimate of 5 hours. It has been MSHA's experience that extensions of acceptances for conveyor belts take only slightly less time to evaluate than new application submittals. Accordingly, the 4 hours for a new approval, and 3 hours for an extension of approval are more reasonable estimates based upon MSHA's more recent experience.

The total cost per application would be $624, which includes $177 for testing ($59 per hour x 3 hours) and $447 per evaluation ($59 per hour x 1.895 support factor x 4 hours). An application for an approval of a similar belt or an extension of approval might not necessarily require testing, but the application would have to be evaluated. For example, if a manufacturer submits a 5-ply belt that is identical, except in number of plies, to a family of belts with 3, 4, and 6 plies that have been previously approved, MSHA would likely grant an extension of approval to the 5-ply belt without additional testing. The estimated cost for an evaluation for such an application would be $335 ($59 per hour x 1.895 support factor x 3 hours).

MSHA estimates that evaluation and testing would be required for all approval applications at an estimated cost of $624 per application. Thus, the estimated 120 approval applications submitted the first year of the program would result in a cost to the manufacturers of $74,880. Of the 30 applications for extensions of approval submitted the first year, MSHA estimates that one-half (15) would require testing and evaluation, at a resulting cost of $7,680 ($335 per evaluation + $177 per testing for each of the 15 applications). MSHA estimates that the remaining 15 applications would require evaluation but not testing, at a resulting cost of $5,025 ($335 per evaluation for

15 applications).[20] The total cost for testing and application fees during the first year would be $87,585.

During the second year of the program, when an estimated 60 applications would be submitted for new approval and 40 applications would be submitted for approvals of similar belts or extensions of approvals, MSHA estimates that one-half (20) of the applications for similar belts in extension of approval would also require testing. The total cost for testing and application fees during the second year would be $54,380, calculated as follows: ($624 x 60 applications) + ($335 per evaluation for 20 applications without testing) + ($335 per evaluation + $177 testing for 20 applications).

During the third year and for each succeeding year, MSHA estimates that 40 applications per year would be received, 20 new approval applications and 20 extension of approval requests. MSHA estimates that one-half (10) of the extension of approval requests would not require testing. The total cost for testing and application fees during the third and succeeding years would be $20,950 ($624 x 20 applications)+ ($335 per evaluation for 10

[20]In the original 1992 PRIA, MSHA assumed that all applications would require testing. However, a review of MSHA records indicates that not all applications, specifically extension applications, require testing. Since January of 1995, only 8 of 20 extension applications received by MSHA have required testing. Based on this information, MSHA believes that a reasonable estimate is that one-half of extension applications would be tested, rather than all of them, which was previously assumed.

applications without testing) + ($335 per evaluation + $177 per testing for 10 applications).

§ 14.5 Test samples

Upon request by MSHA, applicants would have to submit three 5-foot by 9-inch samples for testing under this section. The minimum width belting for underground coal mines is generally 36 inches. Therefore, only 5 feet of belt (which can be divided into three 9-inch wide pieces), at an estimated average cost of $20 per foot, would be required. MSHA estimates that the material costs would be $100 (5 feet x $20 per foot) and the shipping cost for each five-foot-long sample submitted for testing would be approximately $35.[21] MSHA anticipates that applicants would submit a sample for each application for approval that requires MSHA testing.

In the first year, MSHA estimates that there would be 135 applications requiring testing. The material costs and shipping costs for the 135 first-year test samples submitted with these applications would be $18,225 ($135 x 135 applications). In the second year, MSHA estimates that there would be 80 applications requiring testing. The material and shipping costs for the 80 second-year test samples submitted with these applications would

[21]The original 1992 PRIA did not address separately the cost for shipping samples.

be $10,800 ($135 x 80 applications). In the third and each succeeding year, MSHA estimates that there would be 30 applications requiring testing. The material and shipping costs for these 30 samples submitted with these applications would be $4,050 ($135 x 30 applications).

§ 14.6 Issuance of approval

This section would specify that an approval or a notice of reasons denying approval would be issued by MSHA after reviewing an application and testing a product. It also would prohibit an applicant from representing a belt as approved prior to issuance of its approval by MSHA. These costs would be included in the testing and evaluation charges to the applicants.

§ 14.7 Approval marking and distribution record

The specifications for approval marking on a conveyor belt would be changed from the existing rule. The change modifies the location of the marking from approximately one inch from the edge to marking across the width of the belt. This change would permit greater ease of identification because belt edges fray during use, often making markings close to the edge indiscernible. The approval marking would have to be placed at intervals not to exceed 60 feet rather than every 30 feet, as the current rule requires. The current requirement for the marking to be at least ½-inch high would be retained. The proposed rule also would allow more flexibility in how the markings are

applied. MSHA attributes no additional costs to this proposed revision of the existing standard. There might be a cost savings from liberalizing the way markings are applied; these savings, however, would not be expected to be significant.

Applicants would be required to maintain records of the initial sale of each belt having an approval marking. The records of the approved belts would be expected to be maintained for the projected service life of the belts, as determined by the applicants. The proposed rule does not specify the type of record to be maintained. MSHA assumes most manufacturers would use existing record systems to fulfill this requirement. No costs are associated with this requirement.

§ 14.8 Quality assurance

In this section, MSHA would require applicants to manufacture conveyor belts as approved, either to flame test a sample of conveyor belt or to inspect and test certain materials that contribute to its flame resistance, to calibrate instruments, to control documentation, and to notify MSHA immediately when belt has been distributed that does not meet the specifications of the approval. This notification would have to include a description of the nature and extent of the problem, the locations where the belt has been distributed, and the approval-holder's proposed plan for corrective action, such as recalling the belt.

MSHA assumes that manufacturers already have sophisticated quality assurance programs in effect. These programs test batches, lots, or slabs for various characteristics, such as flame resistance, adhesion, strength, and abrasion resistance. MSHA also assumes 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 this proposed rule. A 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 identifying the mine that has purchased a particular belt is relatively simple.

Distribution of belts that do not meet the specifications of the approval should be rare. MSHA estimates that an average of 12 belts per year not meeting specifications would be distributed, but the actual number could be much smaller. Notifying MSHA of the distribution of these belts would take about 15 minutes per notification and would be done by professional personnel compensated at $43 per hour. The annual cost of notification would therefore be about $129 for labor.[22]

[22]MSHA estimates that the communications costs per notification, by electronic mail or other electronic means, would be negligible.

§ 14.9 Disclosure of Information

This section states that all information concerning product specifications and performance submitted to MSHA would be considered proprietary; MSHA would notify the applicant of requests for disclosure of information concerning its conveyor belts. MSHA associated no costs with this notice.

§ 14.10 Post-approval product audit

This section subjects approved conveyor belts 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 requires belts to be submitted to the Agency for cause at any time. Submissions of belts for cause, however, are expected to be infrequent.

MSHA's best estimate is that 12 belts in total would be submitted for audit each year, starting with the second year (twelve months after the issuance of their approval).[23] MSHA assumes that these audits would be necessary to confirm that belt is manufactured according to approval requirements.

Three samples of belt 5 feet long by 9 inches wide would have to be submitted. The minimum width belting for underground coal mines is generally 36 inches. Therefore, only 5 feet of

[23]In the original 1992 PRIA, MSHA estimated that 74 belts would be submitted for audit each year. MSHA reduced this estimate to reflect the decline in the number of conveyor belt manufacturers from 74 to 10.

belt (which can be divided into three 9-inch wide pieces), at an estimated average cost of $20 per foot, would be required. Starting with the second year, the total value of audited belts would be $1,200 per year (12 audits x 5 feet per audit x $20 per foot), a cost that would be borne by the approval holders. The shipping cost per belt submitted is estimated to be $35, for an annual shipping cost of $420 for the 12 belts submitted for audit each year.

§ 14.11 Revocation

This section specifies MSHA's authority to revoke an approval granted under proposed part 14 whenever a conveyor belt fails to meet the applicable technical requirements specified or creates a hazard when used in a mine. Unless the conveyor belt poses an imminent hazard to the safety or health of miners, the approval-holder would be informed in writing of MSHA's intent to revoke an approval. The right to demonstrate or achieve compliance with the product approval requirements and to receive a hearing, when requested, would be provided to the approval holder. No costs are associated with this provision.

COST OF COMPLIANCE BY PROVISION IN SUBPART B - TECHNICAL REQUIREMENTS

§ 14.20 Flame resistance

This section is based upon the joint efforts by MSHA and the U.S. Bureau of Mines to develop a test for the flame resistance of conveyor belts that would be more representative of the mining environment than the present test specified in § 18.65. No costs are associated with this section.

§ 14.21 Belt flame test apparatus

This section describes the principal parts of the apparatus used to test for flame resistance of conveyor belt. An applicant for conveyor belt approval would not be required to construct an apparatus, either prior to submission of a belt for approval or as part of a quality assurance program. The Approval and Certification Center would conduct the tests and perform the evaluations for the fees described above in § 14.4.
No additional costs to the manufacturers are associated with this section.

§ 14.22 Test for flame resistance of conveyor belt

This section specifies the test procedures and acceptable performance requirements to approve conveyor belt as flame resistant. A 5-foot long by 9-inch wide sample of belt would be positioned and secured in the test chamber as specified in § 14.21. An airflow of 200 ± 20 feet per minute across the belt during the test would be required.

The sample would be subjected to a gas-fueled impinged-jet burner flame for five minutes in the test apparatus. The burner

flame would be applied to the front edge of the sample. A sample, after it ceases to burn, would pass if it exhibited an undamaged portion of belt across its width. Each of the three samples submitted for testing would have to pass for the conveyor belt to be approved by MSHA.

The costs of this test are included in the previously discussed proposed § 14.4 -- Application Procedures and Requirements.

§ 14.23 New technology

This section would permit the Agency to approve a conveyor belt that incorporates new technology if the belt is as safe as one which meets the requirements. No costs are associated with this section.

SUMMARY OF COSTS OF COMPLIANCE FOR PROPOSED PART 14

The total initial cost of compliance for this proposed rule is $634,319 for the first year and $83,269 for the second year. The total annual cost of compliance for this proposed rule would be $32,769 for the third year and for each succeeding year.

COST OF COMPLIANCE WITH PROPOSED §75.1108-1

Introduction

Sixty days after publication of the rule the provisions of proposed part 14 would take effect, and all applications for approval of conveyor belt would have to be submitted under part

14 of this chapter. Moreover, on this same date §75.1108-1(a) would take effect, and mine operators would be permitted to use either conveyor belt accepted under part 18 or approved under proposed part 14. One year after that date, §75.1108-1(b) would be effective, and all belts purchased for use in underground coal mines would have to be approved under proposed part 14 of this chapter.

The effective date for conveyor belt to meet the proposed part 14 flame test is given in §75.1108-1(b). Underground coal mines would incur the costs of §75.1108-1(b).

Methodology and Assumptions

MSHA determined the costs of compliance with the proposed rule by estimating the incremental costs of underground conveyor belts over the life of those belts. Based on testimony provided during the public hearing, MSHA assumes that belts that would pass the flame-resistance test in proposed part 14 ("new" belts) would have useful lives equal to those of the belts that are accepted under existing part 18 ("old" belts).

In the original 1992 PRIA for the proposed rule, MSHA estimated that conveyor belts accepted under existing part 18 have an average useful life, depending on belt width, of 8 to 10 years. These estimates were based on advertising literature and published material from various conveyor belt manufacturers

describing their products. Commenters to the proposed rule, while indicating that the potential life of conveyor belting for underground coal mines might be 10 years or longer, consistently stated that the average life of their product in use has ranged from 4 to 8 years, depending on belt width. For this updated PRIA, MSHA has therefore modified its earlier estimate of the average life to 5 to 7 years, depending on belt width.

As indicated previously, some belts currently in use would pass the proposed part 14 flame test. MSHA estimated in the original PRIA for the proposed rule that between 5 and 10 percent of the currently purchased belts would have demonstrated that they can pass the proposed part 14 flame test. In response to commenters' estimates ranging from a high of 10 percent and a low of 2 percent, MSHA estimates that 5 percent of currently purchased belts for use in underground coal mines would meet the proposed part 14 flame test.

There is a market for used conveyor belts. Used belts are trimmed, (e.g., a frayed 42-inch belt has 3 inches trimmed from each edge to make a 36-inch belt) or cut into shorter lengths and are sold either to other, generally small, underground coal mines, or are sold for use in other applications. Some of these other applications include use at surface mines, for gymnasium floors, and in various agricultural applications. MSHA assumes the primary purchasers of used conveyor belt are small mines.

Estimates of incremental costs of the "new" belts were made after discussions with seven major manufacturers of conveyor belts.

Costs of Compliance

MSHA estimates that annual sales of conveyor belt for underground coal mines are currently about $64 million. The proposed rule would require that all belt purchased one year after the effective date of part 14 would have to be approved under proposed part 14 of this chapter.

As described in Chapter II of this REA, belts vary in width, thickness, strength, length, and useful life. In order to estimate the costs of compliance with the proposed rule, this analysis separates belts into three general categories by width: (1) belts 36 inches or less (narrow belts) (2) belts greater than 36 inches up to 42 inches (medium belts); and (3) belts more than 42 inches (wide belts). Narrow belts are generally used on the section and, for many small mines, on the mainline as well. Narrow belts are usually thinner and wear faster than wider belts. Medium width belts are used as section belts at larger mines and on the mainline at both small and large mines. Wide belts are generally used on the mainline and on sections of longwalls.

In order to estimate the potential increase in cost to mine operators of purchasing the "new" belt, MSHA surveyed 7 conveyor belt manufacturers and requested information concerning the difference in price between currently accepted belt and "new" belt.[24] MSHA does not have information concerning the individual conveyor belt market shares of these manufacturers. As a group, however, these 7 manufacturers sell between 60 percent and 80 percent of the conveyor belt sold in the United States. All of these manufacturers reported that the cost of a conveyor belt of a given type and width that would pass the proposed part 14 flame test would exceed the cost of a similar type and width of belt that is currently accepted. The increased costs provided by these seven manufacturers range from a 3 percent increase to a 45 percent increase. Several manufacturers reported more than one estimated cost increase because these reported cost increases varied by belt composition and belt width. The 7 manufacturers reported 10 cost estimates, on a percentage basis, as follows for narrow and medium-width conveyor belt:[25]

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[24]One commenter argued that in estimating the increased cost of conveyor belting to underground coal mine operators, MSHA forgot to include the labor costs for installation. However, only additional costs incurred as a result of the proposed rule are properly attributable to the proposed rule. Since conveyor belting under the current flame test in 18.65 involves identical labor costs for installation, MSHA concludes that no additional installation costs for this rule are appropriate.

[25]MSHA chose to present the cost increases in percentage terms rather than in terms of the effect on the price of a particular manufacturer's products in order maintain the confidentiality of the manufacturers surveyed.

3%, 4%, 14%, 25%, 30%, 32%, 32%, 35%, 40%, and 45%

For wide conveyor belt, the 7 manufacturers reported the following estimated cost increases in percentage terms:

3%, 4%, 14%, 25%, 30%, 32%, 32%, 35%, 35%, and 40%

Of the 10 estimates for each belt size, 5 (reported by 5 different manufacturers) were greater than 30 percent and 1 was exactly 30 percent.

In order to determine an average cost increase for new conveyor belt, MSHA used an averaging methodology in which all reported percentage cost increases were given equal weight because the agency could not obtain conveyor belt sales figures from most of these manufacturers.[26] For those manufacturers who reported a range of cost increases, MSHA used the arithmetic mean as that manufacturer's estimate. Finally, in order to provide a range for the cost estimates, MSHA calculated the following three averages: (1) a 26 percent average cost increase for narrow and

[26]Furthermore, MSHA assumes that the current conveyor belt sales of the manufacturers are not appropriate to weight cost increases, because underground coal mine operators would tend to shift their purchases in the future to the lower-priced conveyor belting in compliance with the proposed new flame-resistance test. On the other hand, MSHA expects that a wide variety of conveyor belting would be sold, at a corresponding wide range of prices-- reflecting the range of belt properties, such as hardness, durability, abrasion-resistance, and slippage that are more or less desirable, depending on the application. It is for this reason that MSHA used an average price of belt meeting the proposed new part 14 flame test, rather than the lowest estimated price on the market.

medium-width belt and a 25 percent average cost increase for wide belt, based on all of the reported cost increases; (2) a 15.2 percent average cost increase that excludes all reported cost increases that were greater than 30 percent; and (3) an 11.5 percent average cost increase that excludes all reported cost increases of 30 percent or greater.

Incremental Costs for Belts 36 Inches or Less in Width

Based on data collected by MSHA, there are approximately 2,300 miles of conveyor belting in underground coal mines.[27] The 2,300 miles of conveyor belting refer to the number of miles of conveyor belting going into the mines; there is an equal number of miles of conveyor belting on the return. This is equivalent to 24,288,000 feet of conveyor belting in underground coal mines for conveyance and return.

MSHA estimates that 13,200,000 feet of underground conveyor belts are belts of 36-inch width or less.[28] Assuming a useful life of 5 years, this means approximately 2.64 million feet of narrow belt (1/5 of the total length) is replaced each year. At

[27]In the original 1992 PRIA, MSHA estimated that there were 2,430 miles of conveyor belts in underground coal miles. The decline in the number of miles of underground conveyor belting is due to a reduction in the number of underground coal mines (which more than offset an increase in the amount of conveyor belting per mine during the period 1992 - 1998).

[28]In the original 1992 PRIA, MSHA estimated that approximately 45% of conveyor belting for underground coal mines was narrow; approximately 20% was medium-width; and approximately 35% was wide. Based on data collected by MSHA in 1998, the Agency now estimates that 54.35% of conveyor belting for underground coal mines is narrow; 14.45% is medium-width; and 31.2% is wide.

the current average price of $12.93 per foot (as derived from the survey of the seven belt manufacturers), total annual sales of narrow belt are $34.1 million. Assuming a 5 percent pre-regulatory compliance rate of use and based on a 11.5 percent increase in belt cost, MSHA estimates that the total cost increase for narrow belts would be $3.7 million per year. Assuming a 15.2 percent cost increase, MSHA estimates the total cost increase for narrow belts would be $4.9 million per year. Based on a 26 percent increase, MSHA estimates that the total cost increase for narrow belts would be $8.4 million per year.

Incremental Costs of Belts Greater Than 36 Inches But No More Than 42 Inches in Width

MSHA estimates that approximately 3,511,200 feet of underground conveyor belts are belts of more than 36 inches but no more than 42 inches wide. Assuming a useful life of 6 years, this means approximately 585,200 feet per year of medium width belt (1/6 of the total length) is replaced each year. At the current average price of $15.49 per foot (as derived from the survey of the seven belt manufacturers), total annual sales of 36-inch to 42-inch wide belt are $9.1 million. Assuming a 5 percent pre-regulatory compliance rate of use and based on a 11.5 percent increase in belt cost, MSHA estimates that the total cost increase for medium width belts would be $1.0 million per year.

Assuming a 15.2 percent cost increase, MSHA estimates the total cost increase for medium-width belts would be $1.3 million per year. Based on a 26 percent increase in belt cost, MSHA estimates that the total cost increase for medium width-belts would be $2.2 million per year.

Incremental Costs of Belts Greater Than 42 Inches

MSHA estimates that approximately 7,576,800 feet of underground conveyor belts are belts of greater than 42 inches in width. Assuming a useful life of 7 years, this means approximately 1,082,400 feet of wide belt (1/7 of the total length) is replaced each year. At the current average price of $18.78 per foot (as derived from the survey of the seven belt manufacturers), total annual sales of greater-than-42-inch-wide belt are $20.3 million. Under a 5 percent pre-regulatory compliance rate of use, based on a 11.5 percent increase in belt cost, MSHA estimates that the total cost increase for wide belts would be $2.2 million per year. Assuming a 15.2 percent cost increase, MSHA estimates the total cost increase for greater-than-42-inch wide belts would be $2.9 million per year. Based on a 25 percent increase in belt cost, MSHA estimates that the total cost increase for wide belts would be $4.8 million per year.

SUMMARY OF COSTS OF COMPLIANCE FOR PROPOSED §75.1108-1

Total costs of compliance to mine operators would be between $6.9 million and $15.5 million per year. Table IV-2 presents the costs by width of belt and average cost increases.

SUMMARY OF COSTS TO MANUFACTURERS AND MINE OPERATORS

Table IV-3 presents the combined costs of compliance to conveyor belt manufacturers and to mine operators. MSHA estimates first-year costs would be approximately $634,319. These costs include research and development costs, application fees, quality assurance costs, and audit costs to manufacturers. Starting with the second year, costs would include the increased costs to mine operators for belts meeting the proposed part 14 flame test. By the third year after the effective date of proposed part 14, and each year thereafter, MSHA estimates annual costs of compliance with the proposed rule would be between $7.0 million and $15.6 million.

TABLE IV-2: Costs of Compliance for Mine Operators

Belt Width (x)	Replacement Per Year (Feet)*	Annual Replacement Cost (millions $)*	Annual Incremental Cost Resulting from the Proposed Rule (millions $)[a]		
			25/26%[b]	15.2%[c]	11.5%[d]
36" or less	2,640,000	32.4	8.4	4.9	3.7
36" but no more than 42"	585,200	8.6	2.2	1.3	1.0
Greater than 42"	1,082,400	19.3	4.8	2.9	2.2
Total	4,307,600	60.3	15.5	9.2	6.9

*Replacement conveyor belt per year affected by the proposed rule (total annual replacement net of 5% voluntary replacement).

[a]In some cases, totals may appear to deviate from the sum of their components because the component factors have been rounded in the table.

[b]Average cost increase for sample of seven manufacturers. Average cost increase for sample is 26% for belt width of 42" or less and 25% for belt width of greater than 42".

[c]Average cost increase excluding manufacturers who reported greater than 30 percent.

[d]Average cost increase excluding manufacturers who reported cost increases of 30 percent and greater.

TABLE IV-3: Summary of Costs of Compliance with Proposed Conveyor Belt Flammability Rule for Belt Manufacturers and Underground Coal Mines

Affected Industry	First Year Costs	Second Year Costs	Third Year Costs	Annual Costs[a]
Belt Manufacturers	$634,319	$83,269	$32,769	$32,769
Underground Coal Mine Operators				
25/26%[b]	$0	$15,498,162	$15,498,162	$15,498,162
15.2%[c]	$0	$9,173,359	$9,173,359	$9,173,359
11.5%[d]	$0	$6,940,371	$6,940,371	$6,940,371
Total				
25/26%[b]	$634,319	$15,581,431	$15,530,931	$15,530,931
15.2%[c]	$634,319	9,256,628	$9,206,128	$9,206,128
11.5%[d]	$634,319	$7,023,640	$6,973,140	$6,973,140

[A]Annual costs are those incurred in the fourth and each succeeding year.

[b]Average cost increase for sample of seven manufacturers.

[c]Average cost increase excluding manufacturers who reported greater than 30 percent increases.

[d]Average cost increase excluding manufacturers who reported cost increases of 30 percent and greater.

V. EXECUTIVE ORDER 12866 AND REGULATORY FLEXIBILITY ANALYSIS

Executive Order 12866 requires that regulatory agencies assess both the costs and benefits of intended regulations. MSHA has fulfilled this requirement in this updated PRIA for the proposed rule and determined that this rulemaking is not a significant regulatory action.

The Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), requires regulatory agencies to consider a rule's economic impact on small entities. Under the RFA, MSHA must use the Small Business Administration's (SBA's) definition of a small entity in determining a rule's economic impact or, after consultation with the SBA Office of Advocacy, establish an alternative definition for a small mine by publishing that definition in the Federal Register for notice and comment. MSHA has not taken such an action and, hence, is required to use the SBA definition.

For the mining industry SBA defines "small" as a mine with 500 or fewer employees. MSHA has traditionally considered small mines to be those with fewer than 20 employees. However, to ensure that the conveyor belt proposed rule conforms with the RFA, MSHA has analyzed the impact of the rule on mines with 500 or fewer employees (as well as on those with fewer than 20

employees). MSHA has determined that the proposed rule would not impose a significant economic impact on a substantial number of small mines, whether a small mine is defined as one with 500 or fewer miners or one with fewer than 20 miners.

MSHA has also evaluated the effect of the proposed rule on manufacturing plants with 500 or fewer employees that currently produce conveyor belts for the underground coal mining industry and determined that the proposed rule would not impose a significant economic impact on a substantial number of them.

MSHA has so certified these findings to the Small Business Administration.

FACTUAL BASIS FOR CERTIFICATION

General approach: The Agency's analysis of impacts on "small entities" and "small mines" begins with a "screening" analysis. The screening compares the estimated compliance costs of the proposed rule for small entities in the affected sector to the estimated revenues for the sector. When estimated compliance costs for small entities in the affected sector are less than 1 percent of estimated revenues, the Agency believes it is generally appropriate to conclude that there would be no significant economic impact on a substantial number of small entities. When estimated compliance costs approach or exceed 1

percent of revenue, it tends to indicate that further analysis may be warranted.

Derivation of costs and revenues: MSHA used a quantitative approach in concluding that the proposed rule would not have a significant economic impact on a substantial number of small entities. The Agency performed its analysis for all underground coal mines, which is the mining sector covered by the proposed rule. For the purpose of this analysis, MSHA evaluated the impact of this proposed rule on small underground coal mines using both the traditional Agency definition and SBA's definition of a small mine. The Agency compared the annual costs of the proposed rule for small underground coal mines to their annual revenues, both for mines with fewer than 20 employees and for mines with 500 or fewer employees.

Table V-1 summarizes the results of this analysis. MSHA's estimate of compliance costs for underground coal mines assumes that all manufacturing costs (excluding research and development costs, application costs, testing costs, and quality assurance and audit costs) are passed on as price increases for conveyor belting and that demand for belting is insensitive to these price increases. As shown in Table V-1, compliance costs using both MSHA's traditional definition and SBA's definition of a small mine are less than 1 percent of revenue. MSHA therefore concludes that the proposed rule would not impose a significant

economic impact on a substantial number of small underground coal mines.

TABLE V-1: Annual Costs Compared to Annual Revenues for Small Underground Coal Mines

Mine Type and Size	# Mines	Minimum Estimated Costs (millions)	Maximum Estimated Costs (millions)	Estimated Revenue (millions)	Minimum Cost as % of Revenue	Maximum Cost as % of Revenue
UNDERGROUND COAL MINES						
Small <20	436	$0.7[a]	$1.7[a]	$292[c]	0.2%	0.6%
Small ≤500	972	$6.7[b]	$15.0[b]	$7,211[d]	0.1%	0.2%

[a]Minimum estimated compliance cost based on 11.5% price increase applied to 95% of annual belt sales (5% assumed already in compliance prior to proposed regulation), where current price is $12.93 for narrow belt and $15.49 for medium-width belt. Maximum estimated compliance cost based on 26% price increase for narrow and medium-width belt. Based on MSHA data on the total feet of belting by width in mines with fewer than 20 employees, MSHA estimates that annual sales of belting will be 475,200 feet of narrow belt and 44,000 feet of medium-width belt.

[b]Minimum estimated compliance cost based on 11.5% price increase applied to 95% of annual belt sales (5% assumed already in compliance prior to proposed regulation), where current price is $12.93 for narrow belt, $15.49 for medium-width belt, and $18.78 for wide belt. Maximum estimated compliance cost based on 26% price increase for narrow and medium-width belt and 25% price increase for wide belt. Based on MSHA data on the total feet of belting by width in mines with 500 or fewer employees, MSHA estimates that annual sales of belting will be 2,640,000 feet of narrow belt, 555,700 feet of medium-width belt, and 994,939 feet of wide belt.

[c]Source: MSHA MIS Data, CM441 Report, Cycle 1997/184 on coal production, valued at $19 per ton, for underground coal mines with fewer than 20 employees.

[d]Total underground coal production net of production of underground coal mines with more than 500 employees, with production valued at $19 per ton. Source: MSHA MIS Data, CM441 Report, Cycle 1997/184 on coal production for all underground coal mines; special MSHA PEIR run on coal production for underground coal mines with more than 500 employees.

Other small entities potentially affected by the proposed rule are small manufacturers of conveyor belt for underground coal mines. For these manufacturers, represented in Standard

Industrial Classification (SIC) code 3052 (rubber and plastics hose and belting), SBA defines those with 500 or fewer employees as “small.” An MSHA investigation conducted in 1998 revealed that there were only 10 conveyor belt manufacturers currently active in the manufacture of belting for use in underground coal mines. All 10 manufacturing establishments are small, according to the SBA definition, insofar as they each employ 500 or fewer workers at the plants engaged in the manufacture of conveyor belting for use in underground coal mines.

To estimate the impact of the rule on these small entities, MSHA compared their annualized cost of complying with the proposed rule to their annual revenues. MSHA assumed that conveyor belt manufacturers absorbed all research and development costs, application costs, testing costs, and quality control and audit costs resulting from the proposed rule (but passed on all other manufacturing costs in the form of price increases). MSHA assumed that conveyor belt manufacturer revenues include price increases ranging from 11.5% to 26% resulting from the proposed rule. Table V-2 summarizes the results, which show that compliance costs are less than 1% of revenues (under both minimun and maximum price increases). MSHA therefore concludes that the proposed rule would not have a significant economic impact on small manufacturers of conveyor belt for use in underground coal mines.

TABLE V-2: Annual Costs Compared to Annual Revenues for Small Manufacturers of Conveyor Belt for Underground Coal Mines

Number of Manufacturers	Annualized Cost	Minimum Annual Revenue	Maximum Annual Revenue	Cost as % of Revenue (Minimum)	Cost as % of Revenue (Maximum)
10	$119,000[a]	$70,800,000[b]	$79,800,000[c]	0.2%	0.1%

[a]Annualized cost based on manufacturer costs of $634,319 in Year 1, $83,269 in Year 2, and $32,769 in Year 3 through Year 10. Costs amortized over a 10 year period using a 7% annual discount rate and annualized using a 14.2% annualization rate.

[b]Based on MSHA estimates, current sales of conveyor belt to underground coal mines total $63.5 million. Estimate of minimum future annual revenues assumes a minimum price increase of 11.5% due to the proposed rule.

[c]Based on MSHA estimates, current sales of conveyor belt to underground coal mines total $63.5 million. Estimate of maximum future annual revenues assumes a maximum price increase due to the proposed rule of 26% for narrow and medium-width belt and of 25% for wide belt.

REGULATORY ALTERNATIVES

The Regulatory Flexibility Act requires agencies which are developing proposed regulatory rules to evaluate and include, whenever possible, compliance alternatives that minimize any potential adverse impact on small entities of the regulatory standards. The impact on both small mines and small manufacturers of conveyor belts was a consideration in the development of the proposal.

Proposed part 14 is a product approval standard for conveyor belts. It was developed as a pure performance standard. This means that manufacturers would not, in any way, be constrained in the design of their belts, as long as a belt submitted for approval passed the proposed part 14 flame test. Further, under the proposal, a manufacturer would be permitted to apply for approval of a “family” of belts (i.e., belts that are identical in construction except in certain aspects, such as the number of plies). Thus, a manufacturer who made a belt that varied only in the number of plies (for example, 3, 4, 5, and 6) would only need to file one application for approval with MSHA (rather than four, in the example, one for each belt with a different number of plies). By allowing “families” of belts under one application, MSHA expects that the time required to process and test the belts would be minimized.

MSHA also sought to reduce the economic impact of the proposal on small mines. Proposed 30 CFR 75.1108-1(b) would require mine operators, one year after the effective date of proposed part 14, to purchase only conveyor belts approved under part 14 for use in underground coal mines. This provision would allow mine operators to use existing part 18 approved belt inventories in their possession as long as they were purchased prior to the one year date. After the inventory of part 18 belt is exhausted and existing part 18 belts wear out, the operator would have to purchase belts meeting the proposed flame test for use underground.

VI. OTHER REGULATORY CONSIDERATIONS

EXECUTIVE ORDER 12875 AND THE UNFUNDED MANDATES REFORM ACT

Executive Order (E.O.) 12875, Enhancing the Intergovernmental Partnership, requires executive agencies and departments to reduce unfunded mandates on State, local, and tribal governments; to consult with these governments prior to promulgation of any unfunded mandate; and to develop a process that permits meaningful and timely input by State, local, and tribal governments in the development of regulatory proposals containing a significant unfunded mandate. E.O. 12875 also requires executive agencies and departments to increase flexibility for State, local, and tribal governments to obtain a waiver from Federal statutory or regulatory requirements.

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

For purposes of the Unfunded Mandates Reform Act of 1995, as well as E. O. 12875, this proposed rule does not include any Federal mandate that may result in increased expenditures by

State, local, or tribal governments or increased expenditures by the private sector of more than $100 million.

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

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

EXECUTIVE ORDER 13084: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

MSHA certifies that the proposed rule would not impose substantial direct compliance costs on Indian tribal governments. No Indian tribal government either owns or operates any underground coal mine or manufactures conveyor belt for use in such mines.

EXECUTIVE ORDER 13132: FEDERALISM

MSHA has reviewed this proposed rule in accordance with Executive Order 13132 regarding federalism and has determined that it does not have “federalism implications.” The proposal does not “have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the

various levels of government." There are no underground coal mines or conveyor belt manufacturers owned or operated by any State governments.

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

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

EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM

The Agency has reviewed Executive Order 12988, Civil Justice Reform, and determined that this rulemaking would not unduly burden the Federal court system. The proposed rule has been written so as to provide a clear legal standard for affected conduct, and has been reviewed carefully to eliminate drafting errors and ambiguities.

VII. PAPERWORK REDUCTION ACT

The paperwork requirements, as described below, have been submitted to the Office of Management and Budget (OMB) for review under section 3504(h) of the Paperwork Reduction Act of 1995 (P.R.A. 95). The proposed rule contains information collection requirements in §§ 14.4(c) and (d), 14.5, 14.7(d), and 14.8(d). Annual burden hours are for manufacturers of conveyor belt for use in underground coal mines. Based upon discussions with belt manufacturers, MSHA assumes that there are about 10 belt manufacturers who would submit approval applications upon implementation of this proposed rule.

Although the paperwork compliance costs are included in the total compliance costs of the proposed rule estimated in part IV of this document, the paperwork compliance costs are again presented in this section in order to show their relationship to burden hours.

PAPERWORK BURDEN

Summarized below is detailed information about paperwork requirements which are related to this proposed rule. MSHA estimates that there would be 663 burden hours for the first year related to mine equipment manufacturers, 383 hours for the second year, and 143 burden hours for each year thereafter, for a total of 1,189 burden hours for Years 1 through 3 combined.

Sections 14.4 and 14.7

MSHA estimates that there would be 150 applications submitted the first year (120 new approvals and 30 extensions of approval), 100 applications the second year (60 new approvals and 40 extensions of approval), and 40 applications in the third and each following year (20 new approvals and 20 extension of approval). The time required for the applicant to prepare an application for a new approval is projected to be 5 hours, and the time projected for an approval of a similar belt or for an extension of approval is 2 hours. In addition, MSHA estimates that it would take the manufacturer 15 minutes (0.25 hours) to prepare a report of distribution for belts not meeting specification. MSHA estimates that 12 belts per year would not meet specification.

First Year:

120 new approval applications x 5 hours	=	600
30 extensions of approval applications x 2 hours	=	60
12 reports x 0.25 hours	=	3
		663 hrs.

Second Year:

60 new approval applications x 5 hours	=	300
40 extensions of approval applications x 2 hours	=	80
12 reports x 0.25 hours	=	3
		383 hrs.

Third and each following year:

20 new approval applications x 5 hours	=	100
20 extension of approval applications x 2 hours	=	40
12 reports x 0.25 hours	=	3
		143 hrs.

Total (Years 1-3) 1,189 hrs.

PAPERWORK COMPLIANCE COSTS

Sections 14.4 and 14.5

MSHA estimates that it would take an applicant about 5 hours to prepare a new approval application and 2 hours to prepare an extension of approval application. At a cost of $43 per hour ($43 per hour includes benefits of 43 percent), the cost of a new approval application would be $215 ($43 x 5 hours) and the cost of an extension of approval request would be $86 ($43 X 2 hours). In addition, each application for approval that needs MSHA testing would require three 5-foot x 9-inch samples for testing at a material cost of $100 and a shipping cost of $35.

First year:

120 new approval applications x $215	=	$25,800
30 extension of approval x $86	=	$ 2,580
135 applications requiring testing x $135	=	$18,225
		$46,605

Second year:

60 new approval applications x $215	=	$12,900
40 extension of approval x $86	=	$ 3,440
80 applications requiring testing x $135	=	$10,800
		$27,140

Third year (and each year thereafter):

20 new approval applications x $215	=	$ 4,300
20 extension of approval x $86	=	$ 1,720
30 applications requiring testing x $135	=	$ 4,050
		$10,070
Total (Years 1-3)		$83,815

Research and Development: MSHA estimates that each applicant would expend, on average, an initial $50,000 in research and development costs associated with developing constructions of conveyor belts that would meet the proposed new part 14 laboratory-scale flame test and be commercially acceptable to the mining industry. MSHA estimates about 10 belt manufacturers would submit approval applications upon implementation of the proposed rule. The research and development cost are, therefore, estimated to be:

$50,000 per applicant x 10 applicants = $500,000

Testing and Evaluation: MSHA's Testing and Evaluation fees are $59 per hour for testing and $112 per hour for evaluation ($59 per hour x 1.895 support factor). The three flame tests for a

new approval application would take approximately 3 hours. The evaluation would take approximately 4 hours. Therefore, the total cost for a new approval application would be $624, which includes $177 for testing ($59 per hour x 3 hours) and $447 per evaluation ($59 per hour x 1.895 support factor x 4 hours).

An evaluation for an extension of approval would take approximately 3 hours. Therefore, an application for extension of approval that requires evaluation and testing would cost $512. This cost figure includes $335 for evaluation ($59 per hour x 1.895 support factor x 3 hours) and $177 for testing ($59 per hour x 3 hours).

First year: (Assuming 120 of the new approvals and 15 of the extensions would require testing)

120 new approval applications x $624	= $74,880
15 extension of approval applications (with testing) x $512	= $7,680
15 extension of approval application (without testing) x $335	= $5,025
	Total of $87,585

Second Year: Assuming 60 of the new approvals and 20 of the extensions would require testing)

60 initial approvals x $624	= $37,440
20 extension of approval applications (with testing) x $512	= $10,240
20 extension of approval applications (without testing) x $335	= $ 6,700
Total of	$54,380

Third and succeeding years: (assuming 20 of the new approvals and 10 of the extensions would require testing)

20 inital approvals x $624	= $12,480
10 extension of approval applications (with testing) x $512	= $ 5,120
10 extension of approval applications (without testing) x $335	= $ 3,350
Total of	$20,950
Grand Total (Years 1-3) of	$162,915

Section 14.7(d)

MSHA assumes that manufacturers would fulfill the requirements of § 14.7(d), which require maintaining records of initial sales of approved belt, by using existing record systems. Therefore, no additional paperwork or cost is associated with this requirement.

Section 14.8

Notification of Distribution: Under the proposal, MSHA would have to be notified of the distribution of belts that do not meet the approval requirements. MSHA estimates that an average of 12 belts per year might be distributed that do not meet the approval requirements. The costs associated with this notification would be $129 annually, based on 15 minutes per notification with personnel compensation at $43 per hour.

Section 14.10

Post-Approval Product Audits: 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, no more than once per year. In addition, MSHA would require belts to be submitted to the Agency for cause at any time; submissions of belts for cause, however, are expected to be infrequent. MSHA estimates that approximately 12 belts would be submitted for audit each year starting with the second year (12 months after the issuance of the approval), consisting of 5 feet of belt divided into three 9-inch wide pieces at an estimated cost of $20 per foot. The shipping cost per belt is estimated to be $35.

Second and each succeeding year:

12 audits x 5 feet x $20 per foot	$1,200
12 audits x 1 belt per audit x $35 per belt	$ 420
	$1,620

SUMMARY:	Year 1	Year 2	Year 3 On
Research and Development	$500,000	$ 0	$ 0
Preparation of Application	$ 46,605	$ 27,140	$ 10,070
Testing and Evaluation	$ 87,585	$ 54,380	$ 20,950
Notice of Distribution	$ 129	$ 129	$ 129
Post-Approval Product Audits	$ 0	$ 1,620	$ 1,620
	$634,319	$ 83,269	$ 32,769

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