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Part III

Department of Labor

Mine Safety and Health Administration

30 CFR Part 75
Sealing of Abandoned Areas; Final Rule

DEPARTMENT OF LABOR

Mine Safety and Health Administration

30 CFR Part 75

RIN 1219–AB52

Sealing of Abandoned Areas

AGENCY: Mine Safety and Health Administration (MSHA), Labor.

ACTION: Emergency temporary standard; Notice of public hearings; Notice of close of comment period.

SUMMARY: The Mine Safety and Health Administration (MSHA) is issuing an emergency temporary standard (ETS) under section 101(b) of the Federal Mine Safety and Health Act of 1977 in response to the grave danger that miners face when underground seals separating abandoned areas from active workings fail. MSHA has concluded from its investigations of mine explosions that occurred and other recent reports, that additional immediate action is necessary to protect miners. This ETS includes requirements to strengthen the design, the construction, the maintenance, and the repair of seals, as well as requirements for sampling and controlling atmospheres behind seals. It also increases the level of overpressure for new seals, thus implementing the requirements of the Mine Improvement and New Emergency Response (MINER) Act of 2006.

DATES: This emergency temporary standard is effective May 22, 2007. This standard must be replaced with a final rule within 9 months. MSHA will hold public hearings on July 10, 2007, July 12, 2007, July 17, 2007 and July 19, 2007 at the locations listed in the Public Hearings section below under the **SUPPLEMENTARY INFORMATION** section of this document. If individuals or organizations wish to make an oral presentation for the record, the Mine Safety and Health Administration (MSHA) is asking that you submit your request at least 5 days prior to the hearing dates. The comment period will close on July 6, 2007.

ADDRESSES: Comments must be clearly identified and may be submitted by any of the following methods:

(1) *Federal Rulemaking Portal: http://www.regulations.gov.* Follow the instructions for submitting comments.

(2) *Electronic mail: zzMSHA-Comments@dol.gov.* Include ''RIN 1219–AB52'' in the subject line of the message.

(3) *Telefax:* (202) 693–9441. Include ''RIN 1219–AB52'' in the subject.

(4) *Regular Mail:* MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Room 2350, Arlington, Virginia 22209–3939.

(5) *Hand Delivery or Courier:* MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Room 2350, Arlington, Virginia 22209–3939. Sign in at the receptionist's desk on the 21st floor.

Docket: Comments can be accessed electronically at *www.msha.gov* under the ''Rules and Regs'' link. MSHA will post all comments on the Internet without change, including any personal information provided. Comments may also be reviewed at the Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Room 2350, Arlington, Virginia.

MSHA maintains a listserve that enables subscribers to receive e-mail notification when rulemaking documents are published in the **Federal Register**. To subscribe to the listserve, go to *http://www.msha.gov/subscriptions/subscribe.aspx.*

Information Collection Requirements: Comments concerning the information collection requirements must be clearly identified as such and sent to both the Office of Management and Budget (OMB) and MSHA as follows:

(1) OMB: All comments must be sent by mail addressed to the Office of Information and Regulatory Affairs, Office of Management and Budget, New Executive Office Building, 725 17th Street, NW., Washington, DC 20503, Attn: Desk Officer for MSHA; and

(2) MSHA: Comments must be clearly identified by RIN 1219–AB46 as comments on the information collection requirements and transmitted either electronically to *zzMSHA-Comments@dol.gov,* by facsimile to (202) 693–9441, or by regular mail, hand delivery, or courier to MSHA, Office of Standards, Regulations, and Variances, 1100 Wilson Blvd., Room 2350, Arlington, Virginia 22209–3939.

Hearings: Locations of the public hearings are in the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: Patricia W. Silvey, Director, Office of Standards, Regulations, and Variances, MSHA, 1100 Wilson Blvd, Room 2350, Arlington, Virginia 22209–3939, *silvey.patricia@dol.gov* (e-mail), (202) 693–9440 (voice), or (202) 693–9441. (telefax).

SUPPLEMENTARY INFORMATION: The outline of this ETS is as follows:

I. Public Hearings

MSHA will hold four public hearings on the ETS. The public hearings will begin at 9 a.m. and end after the last speaker speaks, and in any event not later than 5 p.m., on the following dates at the locations indicated:

Date	Location	Phone
July 10, 2007	Lakeview Golf Resort and Spa, One Lakeview Drive, Morgantown, WV 26508	800–624–8300
July 12, 2007	Crowne Plaza Hotel, 1375 South Broadway, Lexington, KY 40504	859–255–4281
July 17, 2007	Embassy Suites Denver, 7525 East Hampden Avenue, Denver, CO 80231	303–696–6644
July 19, 2007	Sheraton Birmingham Hotel, 2101 Richard Arrington Jr. Boulevard North, Birmingham, AL 35203	205–324–5000

The hearings will begin with an opening statement from MSHA, followed by an opportunity for members of the public to make oral presentations. You do not have to make a written request to speak. Speakers will speak in the order that they sign in. Any unallotted time will be made available for persons making same-day requests.

At the discretion of the presiding official, the time allocated to speakers for their presentation may be limited. Speakers and other attendees may also present information to the MSHA panel for inclusion in the rulemaking record. The hearings will be conducted in an informal manner. The hearing panel may ask questions of speakers. Although formal rules of evidence or cross examination will not apply, the presiding official may exercise discretion to ensure the orderly progress of the hearing and may exclude irrelevant or unduly repetitious material and questions. A verbatim transcript of the proceedings will be prepared and made a part of the rulemaking record. Copies of the transcript will be available to the public. The transcript will also be available on MSHA's Home Page at *http://www.msha.gov,* under Statutory and Regulatory Information.

MSHA will accept post-hearing written comments and other appropriate data for the record from any interested party, including those not presenting oral statements. Written comments will be included in the rulemaking record.

II. Introduction

This ETS is issued under section 101(b) of the Federal Mine Safety and Health Act of 1977 (Mine Act) as amended by the Mine Improvement and New Emergency Response Act of 2006 (MINER Act), 30 U.S.C. 811(b). The ETS establishes or revises standards in part 75—subpart D—Ventilation. These new standards strengthen the design, construction, maintenance, and repair of seals and monitoring and control of atmospheres behind seals in order to reduce the risk of seal failure and the risk of explosions in abandoned areas of underground coal mines.

In accordance with section 101(b)(3) of the Mine Act, an Emergency Temporary Standard (ETS) serves as both a final rule with immediate effect and a proposed rule to establish a final rule through the notice and comment process. Therefore, the final rule may differ from an ETS just as any final rule may differ from a proposed rule. The Mine Act states that the ETS is a temporary standard and must be superseded by a final rule within nine months. The Legislative History of the Mine Act reinforces the statutory language regarding the ETS serving as a proposed rule ''so that all views can be carefully considered in connection with the issuance of a permanent standard.'' S. Rept. 181, 95th Cong., 1st Sess. 24 (1977).

The preamble discusses specific provisions that may be included in the final rule and MSHA solicits comments on these provisions.

III. Basis for the Emergency Temporary Standard

A. Regulatory Authority

Section 101(b) of the Mine Act provides that:

1. The Secretary shall provide, without regard to the requirements of chapter 5, title 5, United States Code, for an emergency temporary mandatory health or safety standard to take immediate effect upon publication in the **Federal Register** if [s]he determines (A) that miners are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful, or to other hazards, and (B) that such emergency standard is necessary to protect miners from such danger.

2. A temporary mandatory health or safety standard shall be effective until superseded by a mandatory standard promulgated in accordance with the procedures prescribed in paragraph (3) of this subsection.

3. Upon publication of such standard in the **Federal Register**, the Secretary shall commence a proceeding in accord with section 101(a) [involving notice and comment], and the standards as published shall also serve as a proposed rule for the proceeding. The Secretary shall promulgate a mandatory health or safety standard under this paragraph no later than nine months after publication of the emergency temporary standard as provided in paragraph (2).

An ETS is an extraordinary measure provided by the Mine Act to enable MSHA ''to react quickly to grave dangers that threaten miners before those dangers manifest themselves in serious or fatal injuries or illnesses.'' S. Rept. 181, 95th Cong., 1st Sess. 23 (1977). Additionally, ''* * * once the Secretary has identified a grave danger that threatens miners the Committee expects the Secretary to issue an emergency temporary standard as quickly as possible, not necessarily waiting until [she] can investigate how well that grave danger is being managed or controlled in particular mines.'' *Senate Report at 24.* An ETS takes effect upon publication in the **Federal Register**, and is a fully enforceable standard.

To assure the comprehensive protection of miners, the ETS authority applies to all types of grave dangers without qualification. The legislative history of the Mine Act emphasizes that ''to exclude any kind of grave danger would contradict the basic purpose of emergency temporary standards protecting miners from grave dangers.'' S. Rept. 181, 95th Cong., 1st Sess., 24 (1977). The ETS authority thus covers dangers arising from exposure to toxic or physically harmful substances or agents and to ''other hazards.'' It applies to dangers longstanding or novel, to dangers that ''result from conditions whose harmful potential has just been discovered'' or to which large numbers of miners are ''newly exposed.'' *Id.*

A record of fatalities or serious injuries is not necessary before an ETS can be issued because ''[d]isasters, fatalities, and disabilities are the very thing this provision is designed to prevent.'' *Id.* at 23. At the same time, the legislative history of the Mine Act is clear that an ETS is not limited to new dangers in the mining industry: ''That a danger has gone unremedied should not be a bar to issuing an emergency standard. Indeed, if such is the case the need for prompt action is that much more pressing.'' *Id.* at 24.

When issuing an ETS, MSHA is ''not required to prove the existence of grave danger as a matter of record evidence prior to taking action.'' *Id.* The legislative history expressly recognizes ''the need to act quickly where, in the judgment of the Secretary, a grave danger to miners exists.'' *Id.* The ETS is a critical statutory tool that MSHA can use to take immediate action to prevent the loss of life in the mines. MSHA accordingly has employed an ETS previously to order ''hands-on'' training for miners in the use of self-contained self-rescue (SCSR) devices 52 FR 24373 (June 30, 1987), to order certain training and mine evacuation procedures for underground coal mines 67 FR 76658 (December 12, 2002) and to order new accident notification timeframes, provide new safety equipment, training and drills in mine emergency evacuations 71 FR 12252, (March 9, 2006).

B. Grave Danger

Based on MSHA's accident investigation reports of the Sago and Darby mine explosions,[1] the National Institute for Occupational Safety and Health's (NIOSH) reports on explosion testing and modeling, MSHA's in-mine seal evaluations, and review of technical literature, MSHA has determined that new comprehensive standards for seal design approval, strength and installation approval, construction, maintenance and repair, sampling and monitoring, training and recordkeeping

[1] MSHA Report of Investigation/Mine Explosion, Sago Mine, January 2, 2006 and MSHA Report of Investigation/Mine Explosion, Darby Mine Number 1, May 20, 2006. These reports can be found on MSHA's Web site at: *http://www.msha.gov.*

are necessary to immediately protect miners from hazards of sealed areas.

Underground coal mines are dynamic work environments in which the working conditions can change rapidly. Caved, mined-out areas may contain coal dust and accumulated gas which can be ignited by rock falls, lightning, and in some instances, fires started by spontaneous combustion. Seals are used to isolate and contain this environment of the active workings of the mine. Adequate seals are crucial to prevent an explosion from propagating to the outby side of the seal where miners work or travel. Seals must therefore be designed to withstand elevated pressures and contain explosions by preventing potentially explosive or toxic gasses from migrating into the active working areas of underground coal mines. Miners rely on seals to protect them from the hazardous and sometimes explosive environments within the sealed area.

The existing safety standards for construction of solid-concrete block seals adopt specific construction criteria. Existing requirements addressing construction of seals using equivalent alternative materials and methods were established, as an interim measure, in MSHA's Program Information Bulletin No. P06–16, ''Use of Alternative Seal Methods and Materials Pursuant to 30 CFR 75.335(a)(2)),'' issued on July 19, 2006 (July 2006 PIB). Under the July 2006 PIB, MSHA increased the strength requirements for new alternative seals to reliably withstand an overpressure of at least 50 pounds per square inch gauge (psig) in the conditions in which they will be installed as demonstrated by well-defined and certified engineering designs. An alternative seal design could also be approved based on actual test results validating the psig. All seal construction must be approved by the District Manager in the mine's ventilation plan. To be considered for approval, mine operators must have a professional engineer (PE) who is knowledgeable in structural engineering to certify seal designs and supporting data. In addition, the proposed ventilation plan must provide that a senior mine management official (such as mine manager, superintendent, etc.) certify that the construction, installation, and materials used were in accordance with the mine's approved ventilation plan. Furthermore, the July 2006 PIB requires an assessment of the atmosphere behind existing alternative seals to determine the potential for an explosion and to assess seal integrity. The July 2006 PIB requires the operator to take remedial actions which may include inerting the sealed atmosphere, increasing the capacity of the existing seal to withstand at least 50 psig overpressure, constructing an additional alternative seal having this capacity, or constructing a solid-concrete seal. Finally, the July 2006 PIB requires that high risk seals, (such as if failure could adversely affect miners' safety) and seals with a poor performance history will require additional actions to better protect miners, including periodic monitoring of the atmosphere behind the seals.

MSHA determined in the Sago accident that even though the seals were not constructed as approved in the ventilation plan, they still could withstand an explosion overpressure of 21 psi. In the Agency's root cause analysis of the Sago accident, MSHA found that: (1) The seals were not capable of withstanding the forces generated by the explosion; (2) The atmosphere in the sealed area was not monitored and it contained explosive methane/air mixtures; (3) Lightning was the most likely ignition source for the explosion with the energy transferring onto an abandoned pump cable in the sealed area and providing an ignition source for the explosion. MSHA found that the explosive forces generated behind the sealed area in the Sago accident were at least 93 psi.

In the Darby accident, MSHA found that the seals were improperly constructed and had an inadequate pressure rating. MSHA also concluded that the use of an oxygen acetylene cutting torch to cut a metal strap outby a seal was the most likely ignition source. MSHA further concluded that when seals are improperly constructed, they present a hazard to miners, even when ignition sources are located outby the seal.

When seals are improperly constructed and maintained, air may leak excessively through the seals, which may result in explosive conditions inby the seals. The air leakage causes increased levels of hazardous conditions whereby introduction of ignition sources could cause an explosion. Air leakage from the sealed area to active working areas could also contaminate the atmospheres, resulting in miners being exposed to potential explosions or toxic gasses.

In addition, the ETS requires that insulated cables and metallic objects through or across seals be removed from the area to be sealed, and prohibits welding, cutting or soldering with an arc or flame within 150 feet of a seal. The July 2006 PIB's interim action has serious limitations in that it fails to provide comprehensive protection for miners from the dangers of explosions in sealed areas: it only permits testing as one method of demonstrating seal strength; it does not address explosion forces generated behind a sealed area that are greater than 50 psi; it requires only a one-time assessment of the atmosphere behind the seal rather than a sampling plan approved by MSHA as required under the ETS; although the July 2006 PIB states that periodic monitoring of sealed areas may be required for high risk seals (such as if failure could adversely affect miners' safety), a periodic monitoring frequency was not specified in the July 2006 PIB; the July 2006 PIB does not address the hazard of welding, cutting, and soldering with an arc or flame in close proximity to a seal. Therefore, hazards in existing sealed areas present a grave danger to miners.

The Secretary has therefore determined that miners are exposed to grave danger if existing and new seals are not properly constructed, maintained, monitored, and repaired in accordance with this ETS.

In addition, for the above-stated reasons under the Administrative Procedure Act (APA), 5 U.S.C. 553(b)(B) and (d)(3), MSHA finds good cause exists to dispense with notice and comment and make the ETS effective immediately. To delay the effective date of the ETS is contrary to the public interest because any delay in the ETS effective date further exposes miners to grave danger from inadequately designed, constructed, maintained, and repaired seals.

IV. Discussion of the Emergency Temporary Standard

A. Background

In the Federal Coal Mine Health and Safety Act of 1969 (Coal Act), the predecessor to the existing Mine Act, Congress first recognized that mine operators must seal abandoned and isolated areas of underground coal mines for the protection of miners' safety:

> In the case of mines opened on or after the operative date of this title, or in the case of areas developed on or after such date in mines opened prior to such date, the mining system shall be designed, in accordance with a plan and revisions thereof approved by the Secretary and adopted by the operator, so that, as each set of cross entries, room entries, or panel entries of the mine are abandoned, they can be isolated from active workings of the mine with explosion-proof bulkheads.

Pub. L. 91–173 (Dec. 1969) Section 303(2)(3)).

In the conference report filed in the House, the statement of the managers on

the part of the House stated, regarding the requirement that an abandoned area of a mine either be ventilated or sealed that:

> [t]he determination of which method [(ventilated or sealed)] is appropriate and the safest at any mine is up to the Secretary or [her] inspector to make, after taking into consideration the conditions of the mine, particularly its history of methane and other explosive gases. The objective is that [s]he require the means that will provide the greatest degree of safety in each case. * * * When sealing is required, such sealing shall be made in an approved manner so as to isolate with explosion-proof bulkheads such areas from the active working of the mine.
>
> Under the conference substitute, paragraph (3) of section 303(z) provides that, in the case of mines opened on or after the operative date of this title, or in the case of areas developed on or after such date in mines opened prior to such date, the mining system shall be designed, in accordance with a plan and revisions thereof approved by the Secretary and adopted by the operator, so that, as each set of cross entries, room entries, or panel entries of the mine are abandoned, they can be isolated from active workings of the mine with explosion-proof bulkheads approved by the Secretary or his inspector.
>
> The managers expect the Secretary to take the lead in improving technology in this area of controlling methane accumulations in gob areas and to improve upon this important section 303(z).

Conf. Rep. No. 91–761, 91Fst Cong. 1st Sess., 82 (Dec. 16, 1969) (statement of the managers on part of the House) (emphasis added).

The Mine Act interim mandatory standards required seals to be ''made in an approved manner so as to isolate with explosion-proof bulkheads such areas from the active workings of the mine.'' 30 U.S.C. 863(z)(2).

On May 15, 1992, as part of a comprehensive revision of its regulations for ventilation of underground coal mines, MSHA published standards for construction of seals in § 75.335 of the ventilation standards. The standard requires seals to be constructed of solid concrete blocks at least six inches by eight inches by sixteen inches, but allows seals to be constructed using alternative methods and materials, provided, among other things, that the seal is capable of withstanding a horizontal static pressure of 20 psi. MSHA based this threshold on a U.S. Bureau of Mines 1971 report entitled ''Explosion-Proof Bulkheads—Present Practices.''

A number of manufacturers developed materials, such as cementitious foams and glass-fiber material, which were tested and subsequently deemed suitable for use in alternative seals and marketed under various trade names. MSHA required the manufacturers to have full-scale seals be subjected to explosion testing at NIOSH's Lake Lynn Experimental Mine (Lake Lynn). MSHA then intended for mine operators to construct seals as constructed and tested at Lake Lynn.

On January 2, 2006, an explosion at the Sago Mine in Upshur County, West Virginia caused the death of twelve miners. Later that year, on May 20, 2006, an explosion at the Darby Mine No. 1 in Harlan County, Kentucky, caused the death of five miners. Common to both of these accidents was the failure of the seals in the mine. The failed seals in both mines were constructed with the same approved alternative material for a 20 psi seal. None of the failed seals were constructed in the same manner as they were constructed at Lake Lynn. Therefore, MSHA issued a moratorium on alternative methods and materials for construction of new seals (Program Information Bulletin (PIB) No. P06–11, June 1, 2006, reissued on June 12, 2006 as PIB No. P06–12.).

Following these underground coal mine disasters in 2006, Congress passed and the President signed the MINER Act. Section 10 of the MINER Act requires that the Secretary issue mandatory health and safety standards for seals of abandoned areas no later than December 15, 2007. It also requires the Secretary to revise the current standard to increase the 20 psi standard for alternative seals.

Seal failures at the Sago Mine and Darby No. 1 Mine in 2006 raised awareness of the problems with seal construction and the design criterion of a 20-psi static horizontal pressure. MSHA continued its investigation of these and other failures of alternative seals, and conducted in-mine evaluations of existing alternative seals. It also reviewed the history of seals in the United States and other countries. Presently, most coal producing countries have coal mine seal requirements that are in excess of a 20-psi overpressure. As a result of MSHA's continued investigations and in-mine evaluations, MSHA increased the strength of alternative seals to 50 psi and addressed a number of other issues related to the construction and the effectiveness of current alternative and solid concrete block seals in Program Information Bulletin No. P06–16, ''Use of Alternative Seal Methods and Materials Pursuant to 30 CFR 75.335(a)(2)),'' issued on July 19, 2006 (July 2006 PIB).

On February 8, 2007, NIOSH issued a draft report, ''Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines'' (2007 NIOSH Draft Report). The draft report states that ''mine seals and their related systems such as the monitoring, inertization and ventilation systems require the highest level of engineering and quality assurance. Successful implementation of the seal design criteria and recommendations in this report should reduce the risk of seal failure due to explosions in abandoned areas of underground coal mines.'' (2007 NIOSH Draft Report at 40). In the executive summary of the draft report, NIOSH makes recommendations for formulating seal design criteria.

B. General Discussion

Existing § 75.334(a) requires that inactive areas of underground coal mines be ventilated or sealed. Most inactive areas are sealed because of ground control, ventilation issues, and the long-term costs of maintaining ventilation and roof support in inactive areas. Seals are also installed to withstand overpressures resulting from explosions in inactive areas and to prevent the potentially explosive methane/air mixtures from migrating to the working areas.

A methane/air mixture becomes explosive when 5 percent to 15 percent methane is present with at least a 12 percent oxygen concentration. If an ignition source is available, then an explosion can occur and create high overpressures. The homogeneity of the methane/air mixture contributes to its explosiveness. The homogeneity of the methane/air mixture can vary depending on the elevation and the methane liberation of the sealed area and outside factors such as the current temperature and barometric pressure. The speed of an explosion and the physical characteristics of a sealed area can increase the force of the explosion such that detonations and significant pressure piling are possible.

In order to address mine conditions that influence the magnitude of overpressures in explosions, seals need to be designed and constructed properly and then inspected on a periodic basis and properly maintained to ensure their reliability. The 2007 NIOSH Draft Report states as follows:

> NIOSH engineers examined seal design criteria and practices used in the U.S., Europe and Australia and then classified seals into their various applications. Next, NIOSH engineers considered various kinds of explosive atmospheres that can accumulate within sealed areas and used simple gas explosion models to estimate worst case explosion pressures that could impact seals. Three design pressure pulses (pressure-time curves) were developed for the dynamic structural analysis of new seals under the conditions in which those seals may be used: unmonitored seals where there is a

possibility of methane-air detonation behind the seal; Unmonitored seals with little likelihood of detonation; and monitored seals where the amount of potentially explosive methane-air is strictly limited and controlled. These design pressure pulses apply to new seal design and construction.

For the first condition, an unmonitored seal with the possibility of detonation, the recommended design pulse rises to 4.4 MPa (640 psi) and then falls to the 800 kPa (120 psi) constant volume explosion overpressure. For unmonitored seals without the possibility of detonation, a less severe design pulse that simply rises to the 800 kPa (120 psi) constant volume explosion overpressure, but without the initial spike, may be employed. For monitored seals, engineers can use a 345 kPa (50 psi) design pulse if monitoring can assure (1) that the maximum length of explosive mix behind a seal does not exceed 5 m (15 ft) and (2) that the volume of explosive mix does not exceed 40% of the total sealed volume. Use of this 345 kPa (50 psi) design pulse requires monitoring and active management of the sealed area atmosphere.

Based on MSHA's accident investigation reports of Sago and Darby mine explosions, NIOSH reports on explosion testing and modeling, MSHA's in-mine seal evaluations, and review of technical literature, MSHA identified a number of issues pertinent to the construction and efficacy of current alternative and solid concrete block seals.

C. Section-by-Section Analysis

1. Sec. 75.335 Seals Requirements

The ETS increases seal strength requirements for construction of new seals and, where necessary, establishes new requirements for monitoring and inerting atmospheres of sealed areas. New § 75.335(a) provides that seals constructed in underground coal mines after May 22, 2007 must be designed, constructed and maintained in accordance with MSHA approval of a mine operator's design application and installation procedures incorporated in the ventilation plan.

The ETS establishes a three-tiered approach for overpressure loading criteria applicable to new seals: (1) 50 psi overpressure; (2) 120 psi overpressure; and (3) an overpressure greater than 120 psi. For purposes of this ETS, MSHA intends that overpressure be any pressure exerted by the forces of an explosion that is above normal atmospheric pressure. In developing these overpressure loading criteria, MSHA relied upon the 2007 NIOSH Draft Report, the Agency's safety and health experience with respect to seals and underground mining conditions and investigations, and accepted scientific and engineering principles.

Under the ETS, if a mine operator monitors and maintains the atmosphere in these areas inert, new § 75.335(a)(1) requires a seal design to withstand at least 50 psi overpressure. If a mine operator does not monitor and maintain atmospheres in these areas inert, new § 75.335(a)(2) requires a seal design to withstand at least 120 psi overpressure. A seal design that will withstand an overpressure greater than 120 psi is required under new § 75.335(a)(3) when the mine operator does not monitor and maintain the atmosphere within sealed areas inert and when: (1) The atmosphere in the area is likely to contain homogeneous mixtures of methane between 4.5 percent and 17.0 percent, and oxygen exceeding 17.0 percent throughout the entire sealed area; (2) or pressure piling is likely due to opening restrictions near the proposed seal area; or (3) other conditions are encountered, such as the likelihood of a detonation in the proposed seal area. Where the conditions in § 75.335(a)(3) are likely to occur, the mine operator must revise the ventilation plan required by existing § 75.370 to address the appropriate seal strength.

The ETS does not require mine operators to upgrade seals constructed prior to May 22, 2007. However, new § 75.335(b) enhances the protection afforded miners under the previous standard by requiring, among other things, that atmospheres in the sealed areas be monitored and inerted. If a mine operator does not monitor and inert the atmosphere in an existing sealed area, the strength of the seals must be increased to 120 psi or greater.

a. Sec. 75.335(a)

New paragraph (a)(1) requires that seals be constructed to withstand 50 psi overpressure. However, mine operators who construct these seals must monitor the atmosphere behind the seals and maintain them inert. Mine operators are currently required to construct seals that will withstand 50 psi overpressure under the July 2006 PIB. In addition, the July 2006 PIB required mine operators to assess atmospheres behind alternative seals and take remedial action where necessary. The 2007 NIOSH Draft Report also recommends a 50 psi overpressure for monitored and managed atmospheres behind sealed areas. Monitoring sealed areas allows the mine operator to know the composition of potentially hazardous gases in sealed areas. Use of a 50 psi overpressure seal requires the mine operator to maintain an inert atmosphere in the sealed area since explosions cannot occur within inert atmospheres.

MSHA believes that in mines that liberate significant volumes of methane, the atmosphere in sealed areas will become inert naturally. In mines that produce very small volumes of methane, the atmosphere in sealed areas may never approach explosive methane/air mixtures of 5 percent. However, some mines may need to actively inert the atmosphere in the sealed area. To inert, an inert gas such as nitrogen or carbon dioxide may be injected into the sealed area through boreholes or pipes extending through the seals. The gas may be obtained from a bulk plant and trucked to the mine site and pumped into the sealed area through a borehole or pipe into the seal. It also may be produced at the mine using a nitrogen generator, Tomlinson Boiler, or other inertization device. This process is commonly used in underground coal mines in the United States during firefighting activities and in other countries where spontaneous combustion is common. MSHA is interested in receiving comments regarding: (1) The economic and technological feasibility of monitoring and inerting sealed atmospheres; and (2) methods of inerting sealed atmospheres.

New paragraph (a)(2) requires 120 psi overpressure if the sealed atmosphere is not monitored and maintained inert except as provided in new paragraph (a)(3). This provision allows mine operators to install seals that withstand 120 psi overpressure if they do not choose to monitor and inert the sealed atmosphere. In MSHA's experience, the overwhelming majority of underground coal mine explosions are typically deflagrations. A deflagration occurs when the flame of an explosion propagates through unburned fuel at a velocity below the speed of sound. The faster the flame travels, the higher the pressures become. Maximum pressures in a deflagration involving methane or coal dust are limited to approximately 120 psi without the occurrence of detonation or significant pressure piling. MSHA accident reports during the past 30 years do not reference an underground coal mine explosion in the United States that generated an overpressure of greater than 120 psi except in the rare instance when detonation occurred.

New paragraph (a)(3) also addresses overpressures resulting from pressure piling and detonations. Methane is explosive between 5 percent and 15 percent and requires at least 12 percent oxygen to ignite. (NIOSH 2006, IC 9486) When ignited, an explosion can occur. To account for correction factors of

methane detection equipment and potential contamination of the samples, the ETS requires that methane concentrations between 4.5 percent and 17.0 percent shall be used to determine an explosive atmosphere. If ignited, large volumes of homogeneous explosive methane/air mixtures in a sealed area can generate high explosion overpressures. The homogeneity of methane/air mixtures in a sealed area is affected by a number of factors such as elevation, temperature, methane liberation, and barometric pressure. Based on Agency experience, MSHA anticipates that there will be few mines that have homogeneous explosive methane/air mixtures throughout the entire area to be sealed. Commenters are encouraged to submit information, with supporting documentation, regarding the number of mines that may have homogeneous explosive methane/air mixtures throughout the entire area to be sealed.

MSHA believes that detonations and significant pressure piling may occur under certain situations. Detonations in underground coal mines are rare. A detonation occurs when the flame of an explosion propagates through the unburned fuel at a velocity exceeding the speed of sound (1129 feet per second). Pressures resulting from a detonation involving methane or coal dust can exceed 250 psi. Pressure piling occurs when the atmosphere ahead of the flame front is compressed prior to the arrival of the flame. When the flame burns through this compressed mixture, an increase in the explosion pressure occurs. Thus, if this mixture is compressed to 45 psi prior to the flame arriving, the resulting explosion pressure could exceed 300 psi. Pressure piling can occur when the physical configuration through which the explosion will propagate inhibits the flow of gases for pressure equalization, such as decreasing the number of entries, decreasing the size of the entries, or obstructing the entry.

The ETS does not specify a seal strength under paragraph (a)(3). Under this provision, the mine operator would submit a strength requirement based on mine-specific conditions that are likely to result in pressure piling or detonation in the sealed area. The mine operator must first recommend the seal strength in the ventilation plan. MSHA expects that mine operators will submit a thorough engineering analysis conducted by a person knowledgeable in explosions and explosion overpressures, based on the conditions in the mine. After the seal strength is approved by the District Manager, the process in § 73.336 will apply. MSHA expects that in these few instances, the District Manager and the Office of Technical Support will coordinate MSHA activities related to the approval process. MSHA believes that most mine operators who encounter homogenous explosive methane/air mixtures and pressure piling in the entire sealed area will monitor and inert the atmosphere in sealed areas. Although the recommended maximum seal strength in the 2007 NIOSH Draft Report is 640 psi, MSHA has no empirical or other data, at this time, demonstrating that mine conditions exist that will necessitate seals stronger than 120 psi. MSHA requests comments from the mining community on the appropriateness of the strategy in this ETS for addressing seal strength greater than 120 psi.

In the ETS, MSHA considered a performance-based approach to the strength requirement for seals. However, MSHA included specific numbers for the strength of seals in the ETS as the agency believes this represents a more appropriate approach. MSHA specifically solicits comments on the Agency's approach to the strength requirement for seals.

MSHA is also interested in receiving comments on the appropriateness of the three-tiered approach to seal strength in the ETS. If commenters believe a different regulatory approach should be developed for the final rule the Agency would like commenters to provide: (1) The details for such a strategy, (2) rationale for such a strategy; and (3) feasibility of using such strategy. The Agency particularly seeks the views of the mining community regarding whether there are other effective alternatives to the requirements in the ETS with respect to providing the most appropriate and protective action for miners exposed to hazards of existing sealed areas. Commenters should provide supporting data, and specific alternatives, including information on technological and cost implications.

Most existing seals were constructed to withstand a static horizontal pressure of 20 psi. MSHA also considered requiring mine operators to remove existing seals and replace them with seals that withstand at least 50 psi. Currently, the Agency believes that replacing existing seals is impractical, and in some instances, may create safety hazards. In addition, these existing seals must be monitored and the atmospheres behind them must be maintained inert. The atmosphere inby and outby the seals near the roof, ribs, or floor adjacent to the seal may contain low oxygen and/or explosive methane/air mixtures that are highly hazardous to miners' safety. In addition, the conditions inby the seals, such as bad roofs, roof falls, and water accumulations, may prevent the mine operator from making changes to provide adequate ventilation inby the seals. MSHA seeks comments on the feasibility of including in the final rule a requirement that existing seals be removed and replaced with a higher strength seal.

Another regulatory option that MSHA considered is whether to require mine operators to build new seals outby existing seals. In some cases, this may not be feasible because the seals may have been constructed too close to the outby corner of the pillar so that there is insufficient space to build new seals in the same pillar; and there may not be an additional open entry outby the existing seals allowing for construction of new seals.

MSHA also considered whether to require mine operators to reinforce existing seals. The Agency is concerned with the feasibility of this option and whether such a requirement could expose miners to greater hazards as discussed earlier in this preamble. MSHA, however, will continue to explore technological advances addressing feasible and safe methods to reinforce existing seals in underground coal mines. Commenters are encouraged to submit information and supporting data regarding new technologies to reinforce seal strength.

Existing § 75.335(a) included minimum specifications for seals constructed of solid concrete blocks after November 15, 1992. Also, existing § 75.335 (a)(2) allowed mine operators to use alternative construction methods or materials to construct a seal provided the seal could withstand a static horizontal pressure of 20 psi (subsequently increased to 50 psi in the July 2006 PIB). In addition, the method of installation and material used had to be approved by the District Manager under MSHA's ventilation plan procedures in § 75.370 based on a 1971 report entitled ''Explosion-Proof Bulkheads—Present Practices,'' issued by the former U.S. Bureau of Mines. According to that report, when a sealed atmosphere has adequate incombustible material and minimum coal dust accumulations, it is doubtful that pressures exceeding 20 psi could occur very far from the origin of the explosion. The primary disadvantage of this level of explosion protection is that current evidence establishes that explosions of coal dust or methane can generate explosion pressures of 120 psi, without detonation or pressure piling.

Previous § 75.335(a)(2) also included measures to prevent exposed timber

seals from quickly failing in a fire or other mine emergency. New construction of timber seals must meet the requirements set forth in this ETS.

b. Sec. 75.335(b) Sampling and Monitoring Requirements

ETS § 75.335(b) establishes new sampling and monitoring requirements for sealed areas. This provision requires that on the effective date of this ETS, a certified person, as defined under existing § 75.100, must immediately monitor atmospheres in all existing sealed areas when seals are outgassing, such as when the barometric pressure in the sealed area exceeds the pressure on the outby side of the sealed area. MSHA intends for mine operators to establish a baseline analysis over a 14-day sampling period, as specified under § 75.335(b)(5)(iii), followed by weekly sampling under paragraph (b)(1) of this section. While sampling is being conducted, mine operators must train certified persons in sampling procedures and develop a sampling protocol to be included in the ventilation plan and submitted to the District Manager for approval.

This provision also requires that for seals constructed prior to May 22, 2007 and seals designed for 50 psi overpressure according to ETS § 75.335(a)(1), mine operators shall develop and follow a protocol to monitor methane and oxygen concentrations and to maintain an inert atmosphere in sealed areas. The protocol shall be approved in the ventilation plan. The sampling protocol must ensure that an inert atmosphere behind the seal area is maintained. An explosion will not occur in an inert atmosphere. The July 2006 PIB and this ETS require mine operators to conduct an atmospheric assessment behind existing alternative seals to determine the potential for an explosion and assess seal integrity. This ETS requirement enhances protection of miners working in the active portions of the mine adjacent to sealed areas where existing seals were installed prior to this ETS. In addition, this provision protects the miner where 50 psi seals will be installed under this rule. MSHA recognizes that conditions in mines may vary and mine operators can more appropriately address their specific conditions in the ventilation plan. During 2006, MSHA inspected existing seals. The inspections revealed that some mine operators were not adhering to their approved ventilation plan for seal installation and construction. The ETS emphasizes the importance of sampling sealed atmospheres to ensure that they remain inert.

ETS § 75.335(b)(1) requires that a trained certified person sample atmospheres of sealed areas weekly when the barometric pressure is decreasing or the seal is outgassing. Because the information obtained during sampling of a sealed area is critical to the safety of miners, the ETS requires sampling to be conducted by a certified person. At least one sample shall be taken at each set of seals. If a seal is ingassing, such as when the barometric pressure outside the sealed area exceeds the pressure on the inby side of the sealed area during the weekly examinations, the ETS requires that a sample shall be collected during the next weekly examination to determine if the seal will outgas. If the seal is ingassing during the second consecutive weekly examination, the operator shall examine that seal daily until the seal is outgassing, unless the seal does not outgas. In this circumstance, an alternative protocol must be developed to effectively evaluate the atmosphere in the sealed area and submitted to the District Manager for approval. Although the ETS does not specify the length of time that the seal must be examined to determine if it will outgas, MSHA intends to require mine operators to develop the alternative protocol within a reasonable timeframe. The District Manager may approve different sampling frequencies and locations in the ventilation plan or approve the use of atmospheric monitoring systems in lieu of weekly sampling. The mine operator shall revise the protocol in the ventilation plan if repeated sampling indicates that a seal is not likely to outgas.

MSHA expects that the certified person will conduct sampling required under the ETS as part of the examinations of seals required in existing § 75.360 and § 75.364 and base the time of these examinations on the barometric conditions to the extent possible. All seals and the strata around them will leak air, resulting in an air exchange near the seal during barometric changes. MSHA does not expect the air leakage to significantly impact the atmosphere in a large portion of the sealed area, but it may affect the atmosphere at a sampling location when the seal is ingassing. Therefore, it is important that samples be representative of the atmospheric conditions in the larger portion of the sealed area, rather than just the area immediately inby the seal.

The certified person must take at least one sample at each set of seals during the weekly examination. Each newly constructed seal must be equipped with two sampling pipes. In accordance with the ETS, MSHA expects that most mines will need to take only one sample from a seal in each set of seals. However, the number of seals that need to be sampled will be determined from the results of the 14-day sampling period specified in paragraph (b)(5)(iii) of this section.

If the seal is ingassing during the examination, the certified person must attempt to take a sample during the next weekly examination. After a second attempt is made and the seal is still ingassing, attempts must be made daily until the seal outgasses. If repeated sampling indicates that a seal is not likely to outgas, then the mine operator must submit an alternative protocol to the District Manager. The alternative protocol must address a means to effectively evaluate the atmosphere in the sealed area. The alternate protocol may address various means such as: (1) The use of a borehole or previously installed sampling line to obtain samples, (2) pressure balancing of the ventilation system to make the seals outgas, or (3) the use of inert gas injection.

The District Manager may approve different sampling frequencies and locations in the ventilation plan. This is intended to address those instances when the atmosphere in the sealed area is unstable, close to the explosive range, or subject to other hazardous conditions, such as a history of spontaneous combustion, which make it necessary to sample at a greater frequency. However, a less frequent sampling strategy may be approved in the ventilation plan if the atmosphere in the sealed area is stable and not at all close to explosive range. For example, the oxygen must be significantly below 10 percent, and methane far less than 3 percent or far greater than 20 percent.

Sampling requirements also addresses instances when an adequate evaluation of the atmosphere in the sealed area cannot be obtained with the sampling pipes located 15 feet inby the seal and into the center of the first connecting crosscut inby the seal. In some sealed areas, the District Manager may find it necessary to require in the ventilation plan that samples be obtained at additional locations to determine that the atmosphere is inert. Additional samples may need to be taken at mines with sealed areas that are very large, have multiple sets of seals, connect with another mine, have flooded areas, have capped shafts, or in other circumstances which may cause samples of the atmosphere taken near the seals not to be representative of the entire sealed area.

The ETS also allows the use of an Atmospheric Monitoring System (AMS)

in lieu of a person physically taking samples on a weekly basis. The use of AMS is discussed more fully under paragraph (b)(5)(vi) of this section.

MSHA believes that the sampling strategy in this ETS will yield results that reflect a reasonable representation of the atmosphere in a sealed area. MSHA is requesting comments addressing the sampling approach in this ETS. The agency is particularly interested in comments concerning sampling, and the sampling frequency, including sampling only when a seal is outgassing. The Agency requests comments on whether another sampling approach is more appropriate for a final rule, such as when the seal is ingassing. MSHA also requests comments, information, and experiences of the mining community concerning sampling sealed areas.

Paragraph (b)(2) requires that certified persons shall be trained in sampling procedures included in the protocol at paragraph (b)(5) of this section prior to conducting sampling. This requirement would ensure that certified persons conducting the sampling have the training necessary to use the sampling devices and knowledge of the sampling protocol requirements in the mine's ventilation plan.

This training shall be conducted by persons with knowledge of the requirements in paragraph (b)(5) of this section. Training may be conducted by a variety of people, including a manufacturer's representative, ventilation engineer or a certified person at the mine. MSHA expects the operator to utilize appropriate people to conduct the training.

At a minimum, this training should include:

1. Relevant information in the mine's ventilation plan;
2. Sampling procedures including equipment and methods to be used;
3. Location of sampling points and sampling pipes;
4. The baseline analysis of oxygen and methane concentrations in a sealed area over a 14-sampling day period;
5. Frequency of sampling for each set of seals;
6. Recording procedures required in paragraph (b)(6) of this section;
7. Sampling frequency in the mine's ventilation plan, if an AMS is used; and
8. General information concerning mine gases present in sealed areas.

Training should include specific actions to take in implementing the operator's ''action plan'' when methane concentrations are at one of three different ranges and oxygen concentrations are 10.0 percent or greater.

MSHA recognizes that the amount of time required to train a certified person will vary. For this reason, MSHA is not specifying a minimum amount of time for training, but instead a requirement that is performance-oriented. MSHA anticipates that mine operators will adjust the time required for this training based on the complexity of sampling procedures, sampling protocol, and existing knowledge and skill level of the certified person. MSHA also expects operators will include ''hands-on'' training during this session to assure that the certified person demonstrates the necessary skills and abilities to perform the tasks. Hands-on training would mean that a certified person demonstrates to the trainer the necessary skills and abilities to perform the testing for oxygen and methane. Hands-on training includes practical application of the type of sampling equipment and the methods to be used at the mine. Examples of this type of training include calibration of sampling equipment, setup of equipment, and recognition of the proper functioning of equipment.

All certified persons shall receive refresher training annually to ensure that they maintain the competence necessary to effectively perform the requirements in paragraph (b)(5) of this section. Annual retraining shall be required within 12 months of the person receiving initial or annual training. For example, a certified person receiving initial training in May 2007 is expected to complete annual retraining no later than the end of May 2008. The month that the refresher training is completed establishes the anniversary month for the next annual retraining. This is consistent with other MSHA training requirements.

This ETS also requires mine operators to certify the date and content of the training provided to the certified person. Operators are required to retain these certifications for one year from the time training was conducted. This provision is similar to other certification requirements in part 75 in which the operator certifies by signature and date that training was provided.

ETS § 75.335(b)(3) states that the atmosphere in the sealed area is considered inert when any of the following conditions occur:

(1) The oxygen concentration is less than 10.0 percent;

(2) The methane concentration is less than 3.0 percent; or

(3) The methane concentration is greater than 20.0 percent.

This ETS provision is consistent with MSHA guidance published in the July 2006 PIB. The explosive range of methane is 5 to 15 percent when the oxygen level is 12 percent or more (IC 9486, 2007 NIOSH Draft Report). To allow for the inaccuracy of methane and oxygen detection equipment and potential contamination of the samples, oxygen less than 10.0 percent, methane concentration less than 3.0 percent and methane concentration greater than 20.0 percent were used to determine an inert atmosphere.

ETS § 75.335(b)(4) requires that when oxygen concentrations are 10.0 percent or greater and methane concentrations are from 3.0 percent to 20.0 percent in a sealed area, the mine operator shall take two additional gas samples at one hour intervals. If the two additional gas samples are from 3.0 percent to 20.0 percent methane and oxygen is 10.0 percent or greater, then the mine operator shall initiate actions required in ETS § 75.335(b)(4)(i) or (ii). The ranges for methane and oxygen in this paragraph include a margin of safety, account for errors in instrumentation or sampling methods (NIOSH IC 9486), and allow the mine operator to obtain confirming samples before implementing the actions outlined in (b)(4)(i) and (b)(4)(ii). However, because the atmosphere in the sealed area is critical to the safety of miners, the ETS requires that samples be taken at one-hour intervals under § 75.335(b)(4).

Paragraphs (b)(4)(i) and (b)(4)(ii) of the ETS require the mine operator to implement the action plan specified in the protocol or to withdraw all persons from the affected area when the specified concentrations are encountered. Historically, when methane levels reached 4.5 percent in active areas of mines, miners were withdrawn from the areas that were dangerous due to high concentrations of methane. However, withdrawal of miners is not required if, under paragraph (b)(4)(i), the operator chooses to implement the action plan to address the actions to be taken by mine operators when the specified concentrations in § 75.335(b)(4) are reached; these concentrations provide a margin of safety. However, the action plan must be approved in the mine's ventilation plan and must provide protection to miners equivalent to withdrawal under paragraph (b)(4)(ii). MSHA requests comments on this approach and whether it provides adequate protection for miners. Commenters are encouraged to submit specific language, with supporting data for MSHA to consider for development of a final rule.

ETS § 75.335(b)(5) establishes the elements that must be addressed in a mine operator's sampling protocol and

actions to be taken when sampling results indicate that the atmosphere behind the sealed area is not inert. Paragraph (b)(5)(i) requires that the mine operator specify sampling procedures, including the type of equipment and methods to be used by the mine operator for the sampling program. MSHA believes most mine operators will use hand-held methane and oxygen detection equipment that they currently have at the mine site. Other operators may need to purchase detectors capable of measuring high levels of methane. Although the mine operator may collect samples in containers to be analyzed by a gas chromatograph, the operator must specify in the protocol when the sample will be analyzed and the procedures that will be followed when the sample results indicate action levels are reached. The methods to be used should include the physical connections to the sample pipes as well as the length of time the detector or pump should be operated to collect the sample. The length of time will be dependent on the length of the sampling pipes.

ETS § 75.335(b)(5)(ii) requires that the mine operator specify in the sampling protocol the location of sampling points used for the sealed area in a set of seals. The sampling points should be identified on a mine map, or the operator should have a narrative description of the location of the sampling points that can be readily identified on a mine map.

ETS § 75.335(b)(5)(iii) requires that the mine operator specify procedures in the protocol to establish a baseline analysis of oxygen and methane concentrations at each sampling point over a 14-day sampling period. For existing seals, the mine operator must begin this sampling upon the effective date of this rule. For newly constructed seals, the mine operator must begin this sampling upon completion of the seal construction.

The baseline shall be established after the atmosphere in the sealed area is inert or the trend reaches equilibrium. These samples would be taken by approved hand-held gas detectors or equipment that collects samples in containers to be analyzed by gas chromatograph. These samples need to be collected over a consecutive 14-day sampling cycle to establish a baseline for a future sampling cycle at each sampling point. Samples need only be taken when the seals are outgassing during the baseline period to ensure samples are representative of the larger area inby the seals. If the seals are not outgassing during any of the days of sampling, the baseline sampling period needs to be extended until 14 samples are taken. Once a baseline is established, the seals need to be sampled at least weekly. MSHA is requesting comments on this sampling approach. The agency is particularly interested in comments concerning the establishment of a baseline, including sampling only when a seal is outgassing and whether it is appropriate to sample the atmosphere in sealed areas during ingassing. MSHA also requests comments, information, and experiences with sampling sealed areas, including data, analytical information, establishment of equilibrium, and trends.

ETS § 75.335(b)(5)(iv) establishes the frequency of sampling at each seal or set of seals. Once a baseline is established, the seals must be sampled at least weekly while the seals are outgassing. Weekly examinations under existing § 75.364 cannot exceed a 7-day interval. Mine operators may conduct sampling required under this ETS in conjunction with weekly examinations under existing § 75.364. Depending on the location and the results of sampling, MSHA may require that seals or sets of seals be sampled at different sampling intervals. Additionally, there may be circumstances where seals or sets of seals within a single sealed area, have a different sampling frequency.

ETS § 75.335(b)(5)(v) requires that the mine operator specify size and conditions of the sealed area. Some mine-specific conditions inby the sealed area may include the type of mining, the presence of pillared areas, the average mining height, the occurrence of bottom mining, any entry restrictions near the seals, the size of the sealed area and the number of seals in each set of seals. This information is important to determine the appropriate seal strength.

ETS § 75.335(b)(5)(vi) requires that the protocol address an atmospheric monitoring system (AMS) to monitor sealed areas, where applicable. MSHA may approve use of an AMS to monitor methane and oxygen levels and pressure differentials across the seals in lieu of a person physically taking or collecting methane samples. The AMS consists of sensors to monitor methane and oxygen levels in the sealed area and the pressure differential across the seal.

ETS § 75.335(b)(5)(vii) requires that the protocol include an action plan addressing hazards presented and actions taken when gas samples indicate oxygen concentrations of 10.0 percent or greater for each of the following ranges of methane concentrations: (1) 3.0 percent or greater but less than 4.5 percent; (2) 4.5 percent or greater but less than 17.0 percent; and (3) 17.0 percent to 20 percent. MSHA expects the action plan to address the risk to miners based on the location of seals, the locations of escapeways, the size and nature of the sealed area, potential impact of seal failure on the mine ventilation system, and the exposure to miners to any potential seal failures. MSHA may require additional sampling when methane ranges are between 3.0 and up to 4.5 percent and from over 17.0 percent to 20 percent, as well as possible changes to the ventilation system, or the addition of inert gas to the sealed area. A methane range between 4.5 and 17.0 percent and an oxygen level greater than 10 percent requires the mine operator to follow the action plan set forth in the protocol in the ventilation plan or to evacuate miners from the affected area of the mine. If miners must be withdrawn, the only persons who may remain in the affected area are those persons referred to in section 104(c) of the Mine Act.

ETS § 75.335(b)(6) requires that the certified person promptly record each sample result from sealed areas, including the location of sampling points, and oxygen and methane concentrations. The results of oxygen and methane samples must be recorded as the percentage of oxygen and methane measured by the certified person. Also, the ETS requires, where applicable, that the certified person promptly record monitoring results from AMS systems.

If sampling and monitoring results indicate the presence of a hazardous condition to miners, the certified person must record the hazardous condition found in accordance with existing § 75.363 (Hazardous conditions; posting, correcting and recording). Also § 75.335(b)(6) requires that hazardous conditions be corrected immediately or the area must be posted. In addition, records of hazardous conditions must be reviewed and countersigned by the mine foreman, or equivalent mine official, by the end of the mine foreman's or equivalent mine officials next regularly scheduled working shift.

ETS § 75.335(b)(7) requires that the mine operator retain sampling records at the mine for at least one year from the date of sampling. A one year retention period permits the mine operator to track trends or changes. The one year retention period is consistent with existing §§ 75.360 and 75.364.

c. Sec. 75.335(c) Welding

ETS § 75.335(c) prohibits the use of open flames or arc associated with welding, cutting, and soldering activities within 150 feet of a seal. MSHA intends to apply this

requirement to seals when their construction has been completed. The use of an oxygen acetylene cutting torch to cut a metal strap at a seal was the most likely ignition source in the Darby Mine No. 1 explosion in 2006. Although the metal strap should have been removed before the seal was constructed, the event underscores the importance of the potential dangers when working near seals, and emphasizes the dangers of using open flames near a seal. A methane enriched atmosphere can leak through the seal or surrounding strata into the active area of the mine. The methane may accumulate and form a methane layer outby the seal. If ignited, a flame can propagate into the sealed area. The 150-foot limit is consistent with an existing requirement in § 75.1002(a)(1) that non-permissible equipment be excluded within 150 feet of pillar workings or longwall faces. In determining the 150-foot distance, MSHA provides guidance in MSHA's Program Policy Manual (Volume V-Coal Mines February 2003, Release V–33) which states that the 150-foot distance shall be measured by following the shortest distance that air can travel (tight string distance) through crosscuts, entries or other openings. MHSA does not believe that this requirement will present significant practical or technical problems for the underground coal mining industry. MSHA is requesting comments from the mining community on the appropriateness of the ETS requirement regarding open flames associated with welding, cutting and soldering activities within 150 feet of a seal and the feasibility of this requirement. MSHA suggests that commenters provide specific rationale in support of their position, and include alternatives, if applicable.

d. Sec. 75.335(d) Sampling Pipes

ETS § 75.335(d) revises previous § 75.335(b) and requires each newly constructed seal to have at least two sampling pipes. One sampling pipe must extend into the sealed area approximately 15 feet as required by previous § 75.335(b). This provision of the ETS is based upon sampling procedures recommended in the 1979 MSHA study, ''Interpreting the State of a Mine Fire.'' The study shows that in sampling situations involving fires behind sealed areas, sampling pipes should extend at approximately 15 feet toward the fire. This distance also applied to atmospheric sampling in sealed areas for non-fire situations. The area directly inby a seal is more likely to be affected by ingassing during normal barometric changes.

Under this provision, the second sampling pipe must extend into the first connecting crosscut inby each seal and to the center of the first connecting crosscut in the middle of the intersection. MSHA has included this new provision in the ETS so that the operator can obtain a representative sample of the sealed area. The Agency believes that sampling points within the first connecting crosscut will provide a more representative sample of the sealed area because this atmosphere is less likely to be affected by ingassing. The District Manager may require more than two sampling locations in the ventilation plan under § 75.335(b)(1).

ETS § 75.335(d) requires that each sampling pipe be equipped with a shut-off valve and an appropriate fitting for taking atmospheric samples behind the seals. A tapered fitting, for example, may be connected at the tip of the sampling pipe to easily accommodate a flexible tube attached to a gas analyzer.

The ETS allows for other types of sampling methods that may be used to monitor sealed atmospheres. ETS § 75.335(b) allows a mine operator to use an atmospheric (gas) monitoring system when appropriate. Although MSHA no longer requires that sampling pipes be installed with the sampling end of the pipe to be about 12 inches from the roof and in the centerline of the entry, the most appropriate placement of the sampling end of the pipe should be about 12 inches from the roof. The ETS affords flexibility to mine operators for the placement of the sampling end to allow more accurate sampling strategies to better protect miners. Therefore, the ETS requires that the location of sampling points be specified in the protocol provided under ETS § 75.335(b)(5). MSHA requests comments regarding the appropriate number and location of sampling pipes for a final rule.

e. Sec. 75.335(e) Water Drainage Systems

ETS § 75.335(e) requires that a corrosion-resistant, water drainage system be installed in the seal at the lowest elevation within the set of seals. Water accumulations can affect the integrity of seals since they are not designed to impound water. Previous § 75.335(c)(2) required each water drainage pipe to have a water trap outby the seal. MSHA required the water trap to prevent the exchange of air through the seal and propagation of an explosion. New seal designs under the ETS, however, must meet performance requirements for a drainage system which prevents the exchange of air and the accumulation and impoundment of mine water inby the seals. The ETS also allows for use of new and innovative designs. MSHA has determined that the ETS provision enhances the level of protection afforded under the previous standard. ETS § 75.336(a)(1)(i) requires that drainage system designs be approved by MSHA, and ETS § 75.336(b)(3)(iii)(I) requires estimation of the volume of water flow in the ventilation plan. Depending on the size and mine floor elevations of the sealed area, it may be necessary for more than one seal in a set of seals to contain a water drainage pipe. These provisions provide flexibility and additional oversight by MSHA to help ensure safe and effective water drainage systems to protect miners from seal failure due to water impoundment. The ETS prohibits seals from impounding water.

MSHA requests comments from the mining community on the ETS requirement for water drainage systems for seals, including effective alternatives for a final rule.

2. Sec. 75.336 Seal Design Applications and Installation Approval

The ETS requires that seal design applications and installation procedures be approved by MSHA prior to construction. The ETS approval requirements for seals are derived from previous § 75.335(a)(2), the July 2006 PIB, and Procedure Instruction Letter (PIL) No. I–06–V–09, ''Procedures for Approval of Alternative Seals,'' issued on August 21, 2006 (August 2006 PIL) and are consistent with existing requirements for approving coal mine impoundments in § 77.216–2. Paragraph (a) requires that seal design applications be submitted to MSHA's Office of Technical Support for approval. Seal design applications must conform to the provisions provided in paragraph (a)(1) or (a)(2) which address seal design and installation approval. Once a seal design is approved by MSHA, a mine operator may use the design in accordance with new provisions in paragraph (b) of this section and the requirements of existing ventilation standards in §§ 75.370, 75.371, and 75.372, which address the submission and approval of the ventilation plan.

Previous §§ 75.335(a), (b), and (c) that address design parameters of seals are transferred to ETS §§ 75.336 (a) and (b) and are revised. These previous provisions required mine operators to either use a seal constructed of solid concrete blocks or seals constructed of alternative methods and materials if approved in the mine's ventilation plan. Under the new provisions, a manufacturer or mine operator may submit an application for approval

which can include any seal design. Seal designs specified in previous § 75.335 may be submitted to MSHA for approval, provided the proposed design meets the strength requirements of ETS § 75.335(a). The provisions of ETS § 75.336(a) are derived from the July 2006 PIB that established criteria to guide the District Managers' approval of the use of alternative seals in ventilation plans. These provisions are also derived from the August 2006 PIL that established uniform procedures for application of MSHA regulations related to review and approval of ventilation plans, which include alternative seals constructed in underground coal mines after July 19, 2006. Installation of seals is required to be approved by the District Manager in the ventilation plan in accordance with ETS § 75.336(b).

a. Sec. 75.336(a)(1) Engineering Design Applications

ETS § 75.336(a)(1), which is derived from the August 2006 PIL, sets forth specific requirements that an engineering design application must include. The requirements in paragraphs (a)(1)(i) through (iii) are new and are based on sound engineering principles. They require that a seal design application shall: (1) Address design calculations and analyses, (2) include certification by a professional engineer, and (3) include a Seal Design Table. The documentation required under this paragraph includes design calculations, drawings, and specifications. Design calculations are required, since they provide the technical basis for developing drawings and specifications and serve as the record of the engineering design. Drawings and specifications provide detailed information necessary to construct seals, technical requirements for a seal, and important information and guidance to be followed during seal construction.

These ETS requirements are consistent with existing approval requirements for various mining-related products under subchapter B—Testing, Evaluation, and Approval of Mining Products for permissibility and for approval of impoundment designs under existing § 77.216. Existing approval regulations require applicants to submit substantial engineering documentation as the basis for approval. The engineering documentation provides MSHA with evidence that the design meets accepted engineering practices and principles.

ETS § 75.336(a)(1)(i) requires each engineering design application to address essential design parameters. This information is required for MSHA to make a thorough assessment of the design application to ensure that the seal design will reliably withstand a specific overpressure, and to verify that the seal design is certified according to ETS § 75.336(a)(1)(ii). MSHA will review the application for evidence that each of these design parameters is sufficiently addressed.

The design application should show the placement of gas sampling pipes required under § 75.335(b). Also, the application must address a water drainage system. The drainage system must be corrosion-resistant and should not be subject to detrimental environmental conditions. The dimensions, material type, and components of the water drainage system should be specified. The application should show how the water drainage system will prevent both the exchange of air and the propagation of an explosion through the water drainage system. Also, the application should show how the water drainage system will be able to withstand the applicable overpressure in ETS § 75.335(a).

The design application must address air leakage and should specify the method and materials used to minimize air leakage along the perimeter of each seal and through any construction joints or cracks that could develop. Consistent with previous § 75.335(a)(iv) that required that a sealant material should have a flame-spread index of 25 or less, the mine operator must address the flame-spread index. The flame spread index is established through recognized laboratory testing such as that designated by ASTM E162–07, ''*Surface Flammability of Materials Using a Radiant Heat Energy Source*'' or equivalent.

The design application must include appropriate information to address fire resistance, such as methods and materials used to provide at least one-hour fire resistance. The fire resistance is established through recognized laboratory testing. The seal material should not fail or allow transfer of sufficient heat while being subjected to a fire test incorporating an ASTM E–119–07 time/temperature heat input, or equivalent, for one hour.

A pressure-time curve provides the necessary loading criterion for a seal design and must be provided in the seal design application. The pressure-time curve provides the reflected overpressure and constant-volume pressure plotted as a function of a specific time period. Pressure-time curves for the 50-psi and 120-psi seal strength requirements of ETS § 75.335(a) are provided in the 2007 NIOSH Draft Report. Alternative pressure-time curves may be used for designs provided the pressure-time curves are submitted to MSHA's Office of Technical Support for approval.

The applicant must document the entry dimensions for which the seal design is applicable and the engineering design and analysis. MSHA expects the design documentation, the design assumptions, references of design standards and guidance, material properties and relevant test data, presumptive geotechnical properties and information, geotechnical test data used to substantiate presumed geotechnical properties, data to address the long-term durability of seal materials, loading criteria, design calculations, and the identification of computer software used and the computer input and output files with the critical design values indicated. The design should also address the factors used to account for the variability in material properties, geologic conditions, and the quality of construction. For example, the applicant must show that an appropriate approach was used to derive the geotechnical and material design values. The design should also show the methodology and the procedures used to evaluate all potential failure modes of the seal and strata. MSHA considers design standards and guidance documents as appropriate references, such as Army TM 5–1300, ''*Structures to Resist the Effects of Accidental Explosions,*'' American Concrete Institute ACI 318–05, ''*Building Code Requirements for Structural Concrete and Commentary,*'' and American Concrete Institute ACI 440.2R–02, ''*Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures.*''

Specifications must be provided in the seal design application to define the performance requirements for construction materials and equipment used. Test methods and reference to industry standards for materials (e.g., American Society for Testing and Materials) that will be used in seal construction must also be included in the application. For construction materials whose properties and performance are not well-researched or well-documented, the applicant would be required to provide data substantiating long-term durability and strength.

Applications must provide construction specifications adequately addressing the preparation of the site for seal construction. For example, construction specifications must include rock and coal removal requirements for the foundation. Specifications for foundations must

address both the horizontal and vertical surfaces of the mine opening. Keys formed in rock and coal to increase the lateral restraint must be excavated with equipment that minimizes fracturing and breakout. The applicant must also specify the necessary actions to be taken to prevent water accumulation in the seal construction area since water accumulation could affect material strength. Necessary storage conditions for construction materials, such as moisture, heat, or shelf life should be specified. Construction specifications should also address formwork when a seal construction involves cast-in-place and pneumatically-applied materials.

The application must list provisions that specify quality control procedures for construction and include requirements for material sampling and testing. Material testing should be conducted by personnel certified by professional organizations such as the American Concrete Institute and by Nationally-Recognized Testing Laboratories to ensure proper quality control testing.

The seal design should establish the maximum allowable convergence a seal may undergo without affecting the structural integrity of the seal. The design should also address other physical limitations for a seal, such as the time required following construction to achieve the specified material strength. For example, the time required for an explosive atmosphere to develop in a sealed area must exceed the time required for the seal construction material to achieve its specified strength. The specified strength of a material must take into account variability in strength of the material. The required material strength ensures that the installed material strength of the seal exceeds the specified design strength.

The professional engineer designated in ETS § 75.336(a)(1)(ii) is responsible for the preparation, signing, dating, sealing, and issuing of engineering documents for the design of a seal. Engineering decisions and actions that must be made by and must be the responsibility of the professional engineer are:

1. The selection or development of design standards or methods, and materials to be used in seal construction;

2. Development and preparation of the structural analyses and design computations, drawings, and specifications;

3. The selection or development of techniques or methods of testing to be used in evaluating materials used either during seal construction or following completion of seal construction; and

4. The development of construction procedures.

ETS § 75.336(a)(1)(iii) requires that a Seal Design Table that discusses characteristics related to mine-specific construction be included in the application. These characteristics include the maximum entry width and height for which the specific design is applicable, specified strength of the seal material, thickness of the seal, and the reinforcement and foundation anchorage requirements for the seal. The mine operator may provide additional information in the seal design application.

EXAMPLE CONCRETE SEAL DESIGN TABLE

Entry dimensions (ft)	Thickness (ft-in)	Specified unconfined compressive strength (psi)	Reinforcement	Foundation anchorage

b. Sec. 75.336(a)(2) Full-Scale Explosion Test Application

ETS § 75.336(a)(2) provides requirements for seal applications that are based on full-scale explosion testing. ETS § 75.336(a)(2)(i) requires that explosion tests be certified by a professional engineer knowledgeable in structural engineering that full-scale tests were conducted in accordance with current, prudent engineering practices and the results are applicable to an underground coal mine. Current, prudent engineering practices should include the preparation, signing, dating, certifying and issuing of engineering documents for the design of a seal. The decisions and actions that are the responsibility of the professional engineer are the same as stated above.

ETS § 75.336(a)(2)(ii) requires that the application include technical information related to the methods and materials used during a successful full-scale explosion test. The testing should include, at a minimum, the following blast loadings: (1) The reflected overpressure due to the blast wave of a methane explosion, and (2) the constant-volume pressure due to the exothermic reaction of the combustion of methane. The overpressures stated in ETS § 75.335(a)(1) serve as the minimum peak reflected overpressures that a seal should be capable of withstanding. Ideally, the seal should be tested to its predicted ultimate strength to determine the actual strength of the seal. For example, seals should be tested with the face perpendicular to the direction of a blast wave and subjected to a reflected overpressure, rather than a side-on overpressure. The testing program must address projectile impact on the seals.

ETS § 75.336(a)(2)(ii) requires the applicant to provide technical information related to the methods and material used to construct and test the seals. The properties and laboratory test data of the materials are required. The laboratory test data should be provided by personnel certified by professional organizations such as the American Concrete Institute and by a Nationally-Recognized Testing Laboratory to ensure proper quality control testing. MSHA intends to substantiate the design values used in the analysis and the full-scale testing of the seals.

ETS § 75.336(a)(2)(iii) requires that the application include proper documentation. Proper documentation includes engineering analyses, construction drawings and specifications, and data that address seal material, fire resistance and flame-spread index. The applicant must establish the materials and materials properties required for adequate seal construction. Construction documentation is required to ensure that the seals are properly built and reliable, to address air leakage, and to verify that the material properties of the seal will meet the specified strength criteria.

ETS § 75.336(a)(2)(iv) requires the application to include an engineering analysis addressing differences between actual full-scale test support conditions and the range of support conditions that could be encountered in an underground coal mine. MSHA recognizes that the test site may have different support conditions than an underground coal mine. This information must ensure that a tested

seal design will reliably function as designed in an underground coal mine.

ETS § 75.336(a)(2)(v) requires a Seal Design Table be included in the application that discusses characteristics related to mine specific seal construction. These characteristics include the maximum entry width and height for which the specific design is applicable, specified strength of the seal material, thickness of the seal and the reinforcement and anchorage requirements for the seal. Additional information may be provided at the discretion of the designer.

Entry dimensions (ft)	Thickness (ft-in)	Specified unconfined compressive strength (psi)	Reinforcement	Foundation anchorage

c. Sec. 75.336(a)(3)

ETS § 75.336(a)(3) is consistent with existing § 77.216(2)(b) and Approval Policy 1009, and specifies that MSHA will notify the applicant if additional information or testing is required. The applicant must provide this information, arrange for any additional or repeat tests related to this additional information, and notify the Agency of the location, date, and time of such tests.

d. Sec. 75.336(a)(4)

The applicant, under ETS § 75.336(a)(4), will be notified by MSHA in writing, whether the design is approved or denied. If the design is not approved, MSHA will specify, again in writing, the deficiencies of the application, or necessary revisions for approval. This provision is consistent with existing § 77.216–2 and Approval Policy 1009.

e. Sec. 75.336(a)(5)

ETS § 75.336(a)(5) is consistent with existing § 77 .216–3 and requires the approval holder to promptly contact MSHA's Office of Technical Support, in writing, of all deficiencies, such as design or material flaws, when they become aware. MSHA's intent is that ''promptly'' means the approval holders are expected to contact MSHA as soon as they have knowledge that a deficiency exists.

f. Sec. 75.336(b) Mine Specific Application; Seal Design Approval in the Ventilation Plan

The ETS requires the mine operator to use an approved seal design, provided the District Manager approves installation of the design in the ventilation plan. The requirements in this section are consistent with Procedure Instruction Letter No. I06–V–9 (August 2006) that established uniform procedures for application to MSHA for approval of alternative seals constructed after July 19, 2006.

ETS § 75.336(b) is new and requires that mine operators use an MSHA-approved seal design. The mine ventilation plan that addresses the installation of seals must be approved by the District Manager prior to the mine operator initiating seal construction in the mine. The Darby and Sago mine explosions revealed problems with seal construction. MSHA's accident investigation report into both explosions states that the seals were constructed without mortar between the joints. MSHA determined that overpressure was a problem in both the Sago and Darby accidents. Adequate seals are crucial to contain explosions and prevent potentially explosive or toxic gasses from migrating into the active working areas of underground coal mines. MSHA is requiring that seal installation be approved in the ventilation plan to help ensure that seals are appropriately installed to effectively protect miners.

Under ETS § 75.336(b), the mine operator must use an approved seal design provided the installation is approved in the ventilation plan. These design documents will serve as historical references. Seal design applications must provide information that the seal will withstand the appropriate overpressure from an explosion in accordance with current, prudent engineering practices, design codes and guidelines, and the seal strength requirements of ETS § 75.335(a).

ETS § 75.336(b)(1) requires the mine operator to retain a copy of the seal design approval information for as long as the seal is needed to serve the purpose for which it was built. MSHA intends to review mine operators' seal design approvals at the mine site to evaluate and address construction and other installation-related issues.

ETS § 75.336(b)(2) requires the mine operator to designate a professional engineer to conduct or have oversight of seal installation. The professional engineer is required to certify that the site-specific seal design complies with the provisions of paragraph(a) of this section. The professional engineer will help ensure that proper seal design implementation and related analyses are performed by qualified personnel and ensure seals are constructed according to the drawings and specifications. A copy of the certification must be submitted to the District Manager with the information provided in ETS § 75.336(b)(3). The mine operator must keep a copy of the certification for as long as the seal is needed to serve the purpose for which it was built.

ETS § 75.336(b)(3) lists specific information that a mine operator must address in the ventilation plan. This information will be used by the District Manager to evaluate a seal installation and determine whether the seal design is appropriate for a particular site. Paragraph (b)(3)(i) requires that mine operators include the MSHA Technical Support Approval Number of the seal design. Paragraph (b)(3)(ii) requires a mine map certified by a professional engineer showing the proposed seal location and surrounding areas to be submitted.

ETS § 75.336(b)(3)(iii) requires specific information about the mine site. This information may be included on the mine map of the area to be sealed. Paragraph (b)(3)(iii)(A) requires that the type of seal be included in the ventilation plan. The type of seal must be identified by the approval number provided in (b)(3)(i) of this paragraph.

ETS § 75.336(b)(3)(iii)(B) requires mine operators to include safety precautions to be taken before seals achieve their specified strength. Safety precautions could include withdrawing miners a safe distance from the seal installation site or actively inerting the sealed area.

ETS § 75.336(b)(3)(iii)(C) requires that the mine operator include methods to address site-specific conditions that may affect the strength and applicability of a seal. These conditions could include: the mine opening dimensions and an estimate of dimension increases due to site preparation, such as the removal of weak roof, floor strata or friable coal; consideration of the local geology and mine conditions of the seal installation location; and a description of the ground conditions, which may include anchorage pull-test information. Other factors such as variability in material properties, geotechnical

properties, geologic conditions, and the quality of construction should be considered to ensure that a seal can reliably withstand the overpressures. Adverse ground conditions, such as convergence, may be unsuitable for certain types of seals. These conditions should be addressed and resolved by the professional engineer.

ETS § 75.336(b)(3)(iii)(D) requires that the mine operator specify construction techniques for each type of seal. This could include equipment, procedures, materials and general mine safety information. This information is required to help ensure that the seal is properly constructed.

ETS § 75.336(b)(3)(iii)(E) requires the mine operator to address seal construction site preparation which should include localized mine water drainage and foundation preparation as required in each seal design. The foundation refers to the horizontal and vertical surfaces of the mine opening. Keys or hitches formed in rock and coal to increase the lateral restraint should be excavated with equipment that minimizes the fracturing and breakout of strata. Strata with open joints should be addressed.

ETS § 75.336(b)(3)(iii)(F) requires the mine operator to include the sequence of seal installations. Ventilation controls should be managed during seal construction until the final seals are installed.

ETS § 75.336(b)(3)(iii)(G) requires the mine operator to provide the projected completion date of each set of seals. Changes in ventilation controls may be necessary as seal construction progresses and may occur on a daily basis. MSHA intends for seals to be installed in a timely manner.

ETS § 75.336(b)(3)(iii)(H) requires the mine operator to specify supplemental roof support to be installed inby and outby each seal. Supplemental support provides long-term stability for each seal, and it is important that the Agency know the type of support used in the sealed area. The competency of the strata surrounding the seal is critical to its long-term stability.

ETS § 75.336(b)(3)(iii)(I) requires the mine operator to provide an estimation of the water flow and the dimensions of the water drainage system. This information will be used by MSHA to evaluate whether the water drainage system is appropriate since seals must not impound water.

ETS § 75.336(b)(3)(iii)(J) requires the mine operator to specify the methods used to ventilate the entries outby the seals after completion. Ventilation is necessary to control methane which outgasses from the sealed area. Information about the ventilation methods will help MSHA assess the adequacy of the ventilation plan.

ETS § 75.336(b)(3)(iii)(K) requires the mine operator to specify methods and materials used to maintain each type of seal. Mine operators should include information to address minor repair of cracks, spalls, and small air leaks through and about the perimeter of each seal to control leakage. Roof deterioration, roof falls, and sloughing of the coal pillars may adversely affect the overall strength of a seal by compromising the structural integrity of the supporting strata.

ETS § 75.336(b)(3)(iii)(L) requires the mine operator to specify methods to address shafts and boreholes within the sealed area. The mine operator should specify how and when each borehole will be plugged and each shaft will be filled during the sealing process.

ETS § 75.336(b)(3)(iii)(M) requires the mine operator to provide any additional information requested by the MSHA District Manager for inclusion in the ventilation plan. This provision will ensure that any new developments in technology or any problems related to site-specific conditions in sealing may be addressed by the mine operator through the ventilation plan.

MSHA requests comments on the appropriateness of the ventilation plan contents and whether additional information should be included. Commenters should submit information in support of their positions, including data related to projected cost and technological feasibility.

3. Sec. 75.337 Construction and Repair of Seals

This ETS includes new provision § 75.337 addressing requirements for: preparation of the area to be sealed; supervision of seal construction and repair; certification that the seal was built in accordance with the provisions in ETS § 75.336(b); notification to MSHA concerning construction schedules; and training miners and senior mine management officials in the construction and repair of seals. Repairs addressed by this section are limited to non-structural repairs. The scope of these repairs is related to general maintenance and includes: Excessive air leakage through and around seals; repair of minor cracks; spalling of seal coating; water drainage systems; and sampling pipes. This section of the ETS is based on MSHA experience with mine ventilation plans under existing §§ 75.334, 75.370, and 75.371, and regarding worked-out areas and areas where pillars are being recovered. MSHA believes these ETS provisions are necessary to adequately protect miners' health and safety.

a. Sec. 75.337(a) Site Preparation

ETS § 75.337(a) requires removal of insulated cables from the area to be sealed and removal of metallic objects through or across seals. Paragraph (a)(1) requires removal of all insulated cables, including hanging, buried, and cables within conduit, from the sealed area before seals are built. This requirement is included in the ETS because a spark could be developed if a length of insulated cable were inductively coupled to an electromagnetic pulse, such as those generated by lightning strikes. These sparks can ignite an explosive methane/air mixture. After the SAGO explosion, MSHA contracted with Sandia Corporation, the operator of Sandia National Laboratories (Sandia), to perform modeling and testing to determine if it were possible for lightning to cause electrical energy to enter the Sago Mine and cause an explosion. Sandia has preliminarily determined that a lightning strike could create enough energy in the sealed area to ignite methane.

Typically, as mine operators complete mining activities in an area, they recover the more valuable cables and may only leave behind damaged or deteriorated cables. MSHA anticipates that the removal of abandoned cables will not be a significant burden for mine operators and would not adversely affect future mining activities. This requirement would improve miners' safety because removal of cables reduces the hazard of an explosion caused by an electrical discharge.

MSHA believes that removal of insulated cables and metallic objects through or across seals is feasible and will not involve significant technical or practical problems. MSHA solicits comments on these measures.

ETS § 75.337(a)(2) requires metallic objects that pass through or across a seal to be removed. Gas sampling pipes and water drainage systems required by ETS § 75.335(d) and (e), and form ties approved in the seal design provided by ETS § 75.336 are allowed in the sealed area.

Metallic material can provide a conduit for electrical current to enter the sealed area and ignite methane/air mixtures. It is necessary to limit the use of conductors that may pass around or across seals. Screen, straps, rails, channels, and water pipes are typical metallic materials that are required to be removed under the ETS. Removal of metallic objects through or across seals before they are built will reduce the

hazard of methane explosions and improve miner safety.

b. Sec. 75.337(b) Supervision of Construction and Repair of Seals

ETS § 75.337(b) requires a certified person designated by the mine operator to directly supervise the seal construction and repair process and make appropriate examinations. After the Sago Mine and Darby No. 1 Mine explosions, MSHA inspected seals in underground coal mines across the country. The Agency has determined that some seals were not built correctly. This new provision requires that seal construction for all seals built after May 22, 2007 be directly supervised by a certified person. Existing § 75.100 defines certified person and requires that person to obtain certification from the Secretary of Labor or the State in which the coal mine is located. A certified person shall directly supervise the construction of each seal throughout the construction or repair process. This new provision will assure that all activities related to seal construction, repair, and examination are performed safely and in accordance with appropriate requirements.

ETS § 75.337(b)(1) requires a certified person to examine each seal construction or repair site prior to beginning seal construction or repair to ensure that the site conditions are in accordance with the approved ventilation plan.

ETS § 75.337(b)(2) requires a certified person to observe the construction or repair process during each shift that construction or repair take place. This provision will help ensure construction or repairs of seals conform to the approved seal design and site specific information provided under § 75.336(b).

ETS § 75.337(b)(3) requires a certified person to perform an examination of each seal or repair to verify that the seal or repair is complete. The District Manager may require that each examination include an assessment of any supplemental roof support, ventilation of the seals, sampling pipes and appropriate fittings, and the water drainage system as provided in the ventilation plan under ETS § 75.336(b).

ETS § 75.337(b)(4) requires the certified person certify each seal construction or repair by initialing the date and time of their examination to verify that the required examinations were made.

ETS § 75.337(b)(5) requires a record be made in a book or a log provided for that purpose to affirm that the examinations were conducted. The record shall describe any deficiencies in site preparation, such as construction, repairs, seal completion, and hazardous conditions and any corrections made. The record must be made by the certified person conducting the examination when the examiner arrives on the surface at the end of the shift. The record shall be countersigned by the mine foreman or equivalent mine official. Records of the deficiencies and the corrective actions provide valuable safety information about seal conditions and sealed areas in the mine and the effectiveness of corrective measures.

The recordkeeping requirement for examination of seals would allow MSHA to determine if examinations have been conducted, if results are valid, and that deficiencies in site preparation, construction, repairs, and seal completion found were corrected. By requiring that a record be countersigned, MSHA expects that the mine foreman or equivalent mine official must review the record before countersigning. This provision makes certain that a mine foreman or equivalent mine official is responsible for oversight of seal installation. The countersignature shall be made by the end of the mine foreman's or equivalent mine official's next regularly scheduled working shift.

The records of examinations required under ETS § 75.337(b)(5) shall be kept at the mine for one year. ETS § 75.338 sets out additional seal recordkeeping duration requirements.

c. Sec. 75.337(c) Certification of Construction by Senior Mine Management

ETS § 75.337(c) requires that upon completion of construction of each seal, a senior mine management official, such as a mine manager or superintendent, certify that the construction, installation, and materials used were in accordance with the approved mine ventilation plan. This requirement assures that a senior mine management official takes responsibility for making sure that seals are constructed in accordance with the provisions under ETS § 75.336(b).

d. Sec. 75.337(d) Notification to MSHA

ETS § 75.337(d)(1) requires the mine operator to notify the local MSHA field office between two and fourteen days prior to commencement of seal construction. This requirement provides MSHA the opportunity to observe seal construction. This is particularly critical when a mine operator is installing a new seal design or the mine liberates large amounts of methane.

ETS § 75.337(d)(2) requires the mine operator to notify the MSHA District Manager, in writing, within 5 days of completion of each set of approved seals. This provision allows the District Manager to be informed when all construction is completed. This is a critical time period during the construction of seals. It involves the time period during which seals are achieving full strength and the atmosphere inby the seals may be transitioning into or through a potentially explosive methane/air mixture. MSHA may decide to inspect the newly sealed area, or sample the atmosphere.

ETS § 75.337(d)(3) requires the mine operator to submit to the MSHA District Manager quality control test results required in ETS § 75.336. Material test results shall be sent to MSHA and must include all seal testing and tests of seal construction materials.

e. Sec. 75.337(e) Training

Failure of a seal may result in significant injury, loss of life and/or significant economic loss. Based on recent explosion investigations, MSHA learned that numerous persons involved in constructing seals that failed were not adequately trained. As a result, installation, construction, and repair tasks and the level of quality control exercised during these activities are critical to preventing seal failures and protecting miners.

Under ETS § 75.337(e), the mine operator is responsible for providing training to miners constructing or repairing seals, certified persons supervising seal construction, repair, and examinations described in (b)(1) of this section, and senior mine management officials described in paragraph (c) of this section.

The training shall address materials and procedures required in the approved seal design in the mine's ventilation plan. For example, material training could include how to construct reinforced concrete, masonry block, gunite, and cementitious foam seals. Additionally, training shall include procedures in tasks such as hitching, evacuating weak materials, supporting and stabilizing roofs, and installing sampling pipes and water drainage systems.

Training under this paragraph is also required for persons repairing seals. In addition to the training required for constructing seals, further training may be necessary for repairing a damaged seal. This training could include tasks such as patching small cracks, sealing leaks, and maintaining water drainage systems.

MSHA recognizes that the amount of time required for training in constructing or repairing seals will vary.

For this reason, MSHA is not proposing a minimum amount of time for the training. MSHA expects mine operators to adjust the time for this training based on the complexity of the seal design in the ventilation plan, construction or repair procedures, materials used, and existing knowledge and skill levels of persons receiving the training. Also, changes in the approved seal design or approved ventilation plan will require retraining.

This paragraph also requires mine operators to certify the date that training was provided. Operators are required to retain these certifications for one year from the time training was conducted. This provision is similar to other certification requirements in Part 75 where the operator certifies by signature and date that training was provided.

MSHA requests comments on the provisions provided in this section. In particular, MSHA requests comments concerning the scope and possible alternatives to the requirements related to site preparation, examinations, and notification provisions.

4. Sec. 75.338 Seals Records

ETS § 75.338(a) sets out the recordkeeping duration required for records created under ETS §§ 75.335, 75.336, and 75.337. For the convenience of the mining community, these requirements are listed in the table entitled ''Table § 75.338(a) Seal Recordkeeping Requirements.'' The table lists the record which must be kept, the section requiring the record, and the required retention time.

TABLE TO § 75.338(a). SEAL RECORDKEEPING REQUIREMENTS

Record	Section reference	Retention time
(1) Protocol to monitor methane and oxygen and maintain an inert atmosphere.	75.335(b)	Same as ventilation plan requirements.
(2) Training of certified persons	75.335(b)(2)	1 year.
(3) Gas sampling records	75.335(b)(6)	1 year.
(4) Approved seal design	75.336(b)(1)	As long as the seal is needed to serve the purpose for which it is built.
(5) Certification of provisions of approved seal design is addressed.	75.336(b)(2)	As long as the seal is needed to serve the purpose for which it is built.
(6) Record of examinations	75.337(b)(5)	1 year.
(7) Seal construction certification	75.337(c)	As long as the seal is needed to serve the purpose for which it is built.
(8) Certification of training	75.337(e)	1 year.

ETS § 75.338(b) applies to seal records required to be kept under the ETS, except for the certification required under ETS § 75.337(b)(4) which must be retained at the seal site. Operators must retain records at the mine site. The mine operator may retain records in a computer system elsewhere, provided they are immediately accessible from the mine site by electronic transmission. Records must be secure and not subject to alteration.

ETS § 75.338(c) requires that the operator allow access to any record to an authorized representative of the Secretary of Labor, the Secretary of Health and Human Services, the authorized representative of miners, or other interested parties, upon request. Mine operators are to promptly provide access to any record listed in the table in paragraph (a) of this section. MSHA expects that an operator show due diligence in providing access to required records. Whenever an operator ceases to do business, the operator will be required to transfer all records required to be maintained by this part to any successor operator.

5. Conforming Changes to Other Sections in Part 75

Existing paragraph (ff) of § 75.371 requires the mine operator to provide a description of methods and materials to be used to seal worked out areas when they are different from those specified in paragraph (a)(1) of § 75.335. The provisions in existing paragraph (a) of § 75.335 are revised and moved to paragraph (b) of § 75.335 and paragraph (b)(3) of § 75.336. Therefore, paragraph (ff) is revised to reference sampling requirements provided by paragraph (b) of § 75.335 and ventilation plan contents requirements provided by paragraph (b)(3) of § 75.336.

V. Executive Order 12866

Executive Order (E.O.) 12866 (58 FR 51735) as amended by E.O. 13258 (Amending Executive Order 12866 on Regulatory Planning and Review (67 FR 9385)) requires regulatory agencies to assess both the costs and benefits of regulations. To comply with Executive Order 12866, MSHA has prepared a Regulatory Economic Analysis (REA) for the ETS. The REA contains supporting data and explanation for the summary materials presented in sections V–IX of this preamble, including the covered mining industry, costs and benefits, feasibility, small business impact, and paperwork. The REA is located on MSHA's Web site at *http://www.msha.gov/regsinfo.htm.* A copy of the REA can be obtained from MSHA's Office of Standards, Regulations and Variances. MSHA requests comments on all the estimates of costs and benefits presented in this ETS and in the REA.

MSHA has determined that the ETS would not have an annual effect of $100 million or more on the economy and, therefore, it is not an economically ''significant regulatory action'' pursuant to Sec. 2(f) of E.O. 12866.

A. Population-at-Risk

The ETS applies to all underground coal mines in the United States. Based on preliminary MSHA data, there were 670 underground coal mines, employing 42,667 miners, operating in the U.S. in 2006. Of these, 372 underground coal mines use seals. These 372 mines employ 33,684 miners, of which 30,095 work underground.

B. Benefits

To provide a preliminary quantitative estimate of benefits, MSHA analyzed the explosions in sealed areas that have taken place since 1993, and especially studied the two accidents in 2006 where the seals failed and fatalities occurred: the Sago mine explosion, where 12 miners died, and the Darby No. 1 mine explosion, where 5 miners died. It is reasonable to assume that if the ETS had been in effect, all 17 of these miners' lives might have been saved. Fourteen of these lives might have been saved by the 2006 ETS and final rule on emergency mine evacuation. However, three of the miners that perished in the Sago and Darby accidents died

immediately from the explosion impact. They could not have been saved by the emergency mine evacuation rule. For purposes of estimating benefits, MSHA attributes the saving of three miners' lives to this ETS and splits the remaining 14 lives between this ETS and the 2006 emergency mine evacuation rule. Hence, MSHA attributes the saving of 10 lives to this ETS (3 + (14 ÷ 2) = 10).

MSHA has good data on explosions in sealed areas only since 1993. During the period 1993–2006 (14 years) there were 13 explosions in sealed areas. However, only 11 of these explosions caused any seal damage and thus had the potential to cause fatalities or injuries. Only two of these 11 explosions actually caused fatalities or injuries. A strict division, (10 lives)/(14 years), would suggest that the ETS will save approximately 0.7 lives per year if the explosions followed approximately the same distribution as they did since 1993.

However, MSHA believes that the risk from explosions in sealed areas has been increasing during this time period because the number of seals has been increasing. MSHA did not allow alternative seals until 1992. Prior to 1992, most mines did not seal, but instead ventilated. During the period from 1993 through 2006, mines went through a transition period of shifting from ventilation to seals. The current risk from explosions in sealed areas is therefore higher than the historic risk during this transition period.

MSHA roughly estimates that, on average, during that transition period, the number of mines using seals was no more than ⅔ of the number of mines that currently use seals. Furthermore, the number of seals in mines is cumulative. During this period of increased seal use, MSHA roughly estimates that the average number of seals in mines that used seals was no more than 2/3 of the number in mines that currently use seals. MSHA specifically asks for comment on these estimates. After adjusting this estimate to account for the increased future risk, the ETS will save approximately 1.6 lives per year, since (10⁄14/⅔/⅔) = 1.6. This is MSHA's best estimate on the number of lives saved per year due to this rulemaking.

MSHA also developed a higher risk estimate, based primarily on the distribution of miners put at risk and the characteristics of the explosions themselves. MSHA also asks for comment on these calculations.

In the 11 explosions in sealed areas with property damage, approximately 688 miners total were underground at the time of the explosions. This is an average of 62.5 miners per explosion that were put at risk. In the two explosions at Sago and Darby only a total of 35 miners were underground at the time of the explosions, for an average risk exposure of 17.5 miners per explosion. Fortunately, no explosions in sealed areas at larger mines (so far) have caused any injuries or fatalities.

If an explosion with the characteristics of the explosions at Sago or Darby occurs at a larger mine, many more lives potentially could be lost. Assuming the risk of fatality from an explosion in a sealed area is about the same at both large and small mines, and the number of potential fatalities is proportional to the number of miners working underground, during the other explosions studied by MSHA, then a higher risk estimate of the benefits of the ETS is approximately 5.7 lives saved per year, since 1.6 x (62.5/17.5) = 5.7.

MSHA also calculated the cumulative risk faced by a miner over a 45 year working life. The 372 existing underground coal mines that seal employ 33,684 miners; of these, 30,095 work underground. Under MSHA's best estimate, the ETS will save 1.6 lives per year, which means that the risk of fatality per year per 1,000 miners is 0.053. Over a 45-year working lifetime, the risk of fatality from an explosion in a sealed area is 2.4 per 1,000 miners. If the ETS will save the higher estimate of benefits of 5.7 lives per year, then the risk of fatality per year per 1,000 miners is 0.191. Over a 45-year working lifetime, the risk of fatality from an explosion in a sealed area is 8.5 per 1,000 miners.

With the provisions of the ETS in effect, an explosion is less likely to occur behind seals that are being actively monitored to maintain an inert atmosphere. The provisions of the ETS also strengthen seals to better withstand explosions, which reduces immediate miner injuries and fatalities and gives miners more time to react to a situation involving an explosion.

MSHA requests comments on the benefit estimates developed above and in the REA, as well as on the assumptions and data sources that MSHA used.

C. Compliance Costs

MSHA estimates that the ETS will result in total yearly costs for underground mine operators and contractors of approximately $39.7 million. Total first year costs will be approximately $43.2 million. Disaggregated by mine size, yearly costs will be $2.6 million for the 83 mine operators with fewer than 20 employees; $34.7 million for the 279 mine operators with 20–500 employees; and $2.4 million for the 10 mine operators with more than 500 employees. Most of the compliance cost occurs in the mine size category with 20–500 employees because 75 percent of the mines that use seals are in this category.

MSHA requests comments on the cost estimates developed above and in the REA, as well as on the assumptions and data sources that MSHA used.

VI. Feasibility

MSHA has concluded that the requirements of the ETS are technologically and economically feasible.

A. Technological Feasibility

MSHA concludes that the ETS is technologically feasible. MSHA based its conclusion on an analysis of the compliance requirements of the ETS provisions for training, sampling, and construction and repair. MSHA believes compliance with these requirements is technologically feasible because the materials, equipment, and methods for implementing these requirements currently exist. However, MSHA will be gathering information on seal designs at 120 psi overpressure and will make this information available to the mining community. MSHA solicits comments on this issue, and on seal designs that are greater than 120 psi overpressure.

B. Economic Feasibility

MSHA also believes that the ETS is economically feasible. The yearly compliance cost of the ETS is $39.7 million which is 0.30 percent of all revenues ($39.7 million/$13.1 billion) for all underground coal mines. MSHA concludes that the ETS is economically feasible for these mine operators because the total compliance costs are well below one percent of the estimated revenues for all underground coal mines.

VII. Regulatory Flexibility Act and Small Business Regulatory Enforcement Fairness Act (SBREFA)

Pursuant to the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), MSHA has analyzed the impact of the ETS on small businesses. Based on that analysis, MSHA has notified the Chief Counsel for Advocacy, Small Business Administration, and made the certification under the Regulatory Flexibility Act at 5 U.S.C. 605(b) that the ETS will not have a significant economic impact on a substantial number of small entities. The factual basis for this certification is presented

in full in Chapter V of the REA and in summary form below.

A. Definition of a Small Mine

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

In addition to examining small entities as defined by SBA, MSHA has also looked at the impact of this ETS on underground coal mines with fewer than 20 employees, which MSHA and the mining community have traditionally referred to as ''small mines.'' These small mines differ from larger mines not only in the number of employees, but also in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Therefore, the cost of complying with MSHA's ETS and the impact of the ETS on small mines will also be different. It is for this reason that small mines are of special concern to MSHA.

MSHA concludes that it can certify that the ETS will not have a significant economic impact on a substantial number of small entities that are covered by this ETS. The Agency has determined that this is the case both for mines with fewer than 20 employees and for mines with 500 or fewer employees.

B. Factual Basis for Certification

MSHA initially evaluates the impacts on ''small entities'' by comparing the estimated compliance costs of a rule for small entities in the sector affected by the rule to the estimated revenues for the affected sector. When estimated compliance costs are less than one percent of the estimated revenues, the Agency believes it is generally appropriate to conclude that there is no significant economic impact on a substantial number of small entities. When estimated compliance costs exceed one percent of revenues, MSHA investigates whether a further analysis is required.

For underground coal mines, the estimated 2006 production was 7,813,073 tons for mines that had fewer than 20 employees and 277,500,019 tons for mines that had 500 or fewer employees. Using the 2005 price of underground coal of $36.42 per ton [2] and total 2006 coal production in tons, underground coal revenues are estimated to be approximately $285 million for mines employing fewer than 20 employees and $10.1 billion for mines employing 500 or fewer employees. Thus, the yearly cost of the ETS for mines that have fewer than 20 employees is 0.9 percent ($2.6 million/$285 million) of annual revenues, and the yearly cost of the ETS for mines that have 500 or fewer employees is 0.4 percent ($0.037 billion/$10.1 billion) of annual revenues. Using either MSHA's traditional definition of a small mine (one having fewer than 20 employees) or SBA's definition of a small mine (one having 500 or fewer employees), the yearly costs for underground coal mines to comply with the ETS will be less than 1 percent of their estimated revenues. Accordingly, MSHA has certified that the ETS will not have a significant impact on a substantial number of small entities that are covered by the ETS.

VIII. Paperwork Reduction Act of 1995

A. Summary

This ETS contains information collection requirements that MSHA estimates will result in 82,037 new burden hours and approximately $4.7 million related burden costs to mine operators and manufacturers in the first year that the ETS is in effect. In the second year that the ETS is in effect, and for every year thereafter, MSHA estimates that mine operators and manufacturers will incur 73,006 new burden hours and approximately $4.6 million related burden costs. The burden is different in the first year because some information collection requirements occur only in the first year that the ETS is in effect.

This ETS contains information collection requirements in the following sections: § 75.335 seal requirements; § 75.336 seal design applications and installation approval; and § 75.337 construction and repair.

For a detailed explanation of how the burden hours and related costs were determined, see Chapter VII of the Regulatory Economic Analysis (REA) associated with this ETS. The REA is located on MSHA's Web site at *http://www.msha.gov/REGSINFO.HTM.* A print copy of the REA can be obtained from the Office of Standards, Regulations, and Variances at MSHA.

[2] U.S. Department of Energy, Energy Information Administration, Annual Coal Report 2005, Table 28.

B. Details

The information collection package has been submitted to the Office of Management and Budget (OMB) for review under 44 U.S.C. § 3504(h) of the Paperwork Reduction Act of 1995, as amended. A copy of the information collection package can be obtained from the Department of Labor by email request to king.darrin@dol.gov or by phone request at (202) 693–4129.

Comments on the provisions in the information collection requirements should be sent to both the Office of Information and Regulatory Affairs of OMB and to MSHA. Comments sent to OMB should be sent to the Attention of the Desk Officer for the Mine Safety and Health Administration. Comments sent to MSHA should be sent to the Office of Standards, Regulations, and Variances. Addresses for both offices can be found in the Addresses section of this preamble. Respondents are not required to respond to any collection of information unless it displays a current valid OMB control number. MSHA will publish a notice in the **Federal Register** announcing when OMB has approved the new information collection requirements.

IX. Other Regulatory Considerations

A. The Unfunded Mandates Reform Act of 1995

MSHA has reviewed the ETS under the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1501 *et seq*). MSHA has determined that this ETS does not include any federal mandate that may result in increased expenditures by State, local, or tribal governments; nor will it increase private sector expenditures by more than $100 million in any one year or significantly or uniquely affect small governments. Accordingly, the Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1501 *et seq.*) requires no further agency action or analysis.

B. Executive Order 13132: Federalism

This ETS does not have ''federalism implications'' because it will not ''have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.'' Accordingly, under E.O. 13132, no further Agency action or analysis is required.

C. The Treasury and General Government Appropriations Act of 1999: Assessment of Federal Regulations and Policies on Families

Section 654 of the Treasury and General Government Appropriations Act of 1999 (5 U.S.C. 601 note) requires agencies to assess the impact of Agency action on family well-being. MSHA has determined that this ETS will have no effect on family stability or safety, marital commitment, parental rights and authority, or income or poverty of families and children. This ETS impacts only the underground coal mine industry. Accordingly, MSHA certifies that this ETS would not impact family well-being.

D. Executive Order 12630: Government Actions and Interference With Constitutionally Protected Property Rights

This ETS does not implement a policy with takings implications. Accordingly, under E.O. 12630, no further Agency action or analysis is required.

E. Executive Order 12988: Civil Justice Reform

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

F. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

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

G. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This ETS does not have ''tribal implications'' because it will not ''have substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes.'' Accordingly, under E.O. 13175, no further Agency action or analysis is required.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

Executive Order 13211 requires agencies to publish a statement of energy effects when a rule has a significant energy action that adversely affects energy supply, distribution or use. MSHA has reviewed this ETS for its energy effects because the ETS applies to the underground mining sector. Because this ETS will result in yearly costs of approximately $39.7 million to the underground coal mining industry, relative to annual revenues of $13.1 billion in 2006, MSHA has concluded that it is not a significant energy action because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. Accordingly, under this analysis, no further Agency action or analysis is required.

X. References

ACI 318–05, ''Building Code Requirements for Structural Concrete and Commentary,'' American Concrete Institute.

ACI 440.2R–02, ''Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures,'' American Concrete Institute.

Army TM 5–1300, Navy NAVFAC P0397, Air Force AFR 88–22, Departments of the Army, the Navy, and the Air Force, ''Structures to Resist the Effects of Accidental Explosions,'' November 1990.

ASTM E119–07, ''Standard Test Methods for Fire Tests of Building Construction and Materials,'' ASTM International.

ASTM E162–06, ''Surface Flammability of Materials Using a Radiant Heat Energy Source,'' ASTM International.

Department of Labor, Mine Safety and Health Administration, Final Rule, Underground Coal Mine Ventilation Standards, May 15, 1992.

Kissell, Fred N., ''Handbook for Methane Control in Mining,'' Information Circular 9486. National Institute of Occupational Safety and Health, U.S. Dept. of Health and Human Services, 2006.

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MSHA. Report of Investigation/Mine Explosion, Darby Mine No. 1, May 20, 2006.

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MSHA. Program Information Bulletin No. P06–12, ''Reissued Moratorium on Future Use of Alternative Seal Methods and Materials Pursuant to 30 CFR 75.335 and Assessment of Existing Sealed Areas in Underground Bituminous Coal Mines,'' June 12, 2006.

MSHA. Program Information Bulletin No. P06–16, ''Use of Alternative Seal Methods and Materials Pursuant to 30 CFR 75.335(a)(2),'' July 19, 2006.

MSHA. Procedure Instruction Letter No. I06–V–9, ''Procedures for Approval of Alternative Seals,'' August 21, 2006.

MSHA. Program Policy Manual, Volume V–Coal Mines, Release V–33, February 2003.

MSHA, Approval and Certification Center, Application Cancellation Policy, CDS No. APOL1009, Revised February 27, 2004.

Zipf, R. K., Sapko, M. J., Brune, J. F., ''Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines, Draft Report,'' National Institute of Occupational Safety and Health, U.S. Dept. of Health and Human Services, February 8, 2007.

XI. Emergency Temporary Standard—Regulatory Text

List of Subjects in 30 CFR Part 75

Mine safety and health, Underground coal mines, Reporting and recordkeeping, Ventilation.

Dated: May 17, 2007.

Richard E. Stickler,

Assistant Secretary for Mine Safety and Health.

■ Chapter I of Title 30, part 75 of the Code of Federal Regulations is amended as follows:

PART 75—SAFETY STANDARDS FOR UNDERGROUND COAL MINES

■ 1. The authority citation for part 75 continues to read as follows:

Authority: 30 U.S.C. 811, 863.

■ 2. Revise § 75.335 to read as follows:

§ 75.335 Seal requirements.

Seals shall be designed, constructed, and maintained to protect miners from hazards related to sealed areas. Seal designs and the installation of each seal shall be approved in accordance with § 75.336.

(a) *Seal strength requirements.* Seals constructed on or after May 22, 2007 shall be designed, constructed, and maintained to withstand—

(1) 50 psi overpressure when the atmosphere in the sealed area is monitored and maintained inert in accordance with paragraph (b) of this section;

(2) 120 psi overpressure if the atmosphere is not monitored, and is not

maintained inert, and the conditions in paragraphs (a)(3)(i) through (iii) of this section are not present; or

(3) An overpressure greater than 120 psi if the atmosphere is not monitored and is not maintained inert and;

(i) The atmosphere in the area to be sealed is likely to contain homogeneous mixtures of methane between 4.5 percent and 17.0 percent and oxygen exceeding 17.0 percent throughout the entire area;

(ii) Pressure piling is likely due to opening restrictions near the proposed seal area; or

(iii) Other conditions are encountered, such as the likelihood of a detonation in the proposed seal area.

(iv) Where the conditions in paragraphs (a)(3)(i), (ii), or (iii) of this section are encountered, the operator must revise the ventilation plan to be submitted to the District Manager to address the potential hazards. The plan shall include seal strength sufficient to address the conditions.

(b) *Sampling and monitoring requirements.* Effective May 22, 2007, a certified person as defined in § 75.100 shall monitor atmospheres of sealed areas. For seals constructed prior to May 22, 2007 and for seals designed for 50 psi overpressure, mine operators shall develop and follow a protocol to monitor methane and oxygen concentrations, and to maintain an inert atmosphere in the sealed area. The protocol shall be approved in the ventilation plan.

(1) A certified person shall sample atmospheres of sealed areas weekly when the barometric pressure is decreasing or the seal is outgassing. At least one sample shall be taken at each set of seals. If a seal is ingassing during the weekly examination, a sample shall be collected during the next weekly examination. If the seal is ingassing during the second consecutive weekly examination, the operator shall examine that seal daily until the seal is outgassing, unless the seal does not outgas. In this case, an alternative plan needs to be developed and submitted to the District Manager. The District Manager may approve different sampling frequencies and locations in the ventilation plan, or approve the use of atmospheric monitoring systems in lieu of weekly sampling. The mine operator shall revise the protocol, if repeated sampling indicates that a seal is not likely to outgas.

(2) Certified persons conducting sampling shall be trained in the sampling procedures included in the protocol, as provided by paragraph (b)(5) of this section, before they conduct sampling, and annually thereafter. The mine operator must certify the date and content of training provided certified persons and retain each certification for one year.

(3) The atmosphere shall be considered inert when—

(i) The oxygen concentration is less than 10.0 percent;

(ii) The methane concentration is less than 3.0 percent; or

(iii) The methane concentration is greater than 20.0 percent.

(4) When oxygen concentrations are 10.0 percent or greater and methane concentrations are from 3.0 percent to 20.0 percent in a sealed area, the mine operator shall take two additional gas samples at one-hour intervals. If the two additional gas samples are from 3.0 percent to 20.0 percent and oxygen is 10.0 percent or greater—

(i) The mine operator shall implement the action plan in the protocol; or

(ii) Persons shall be withdrawn from the affected area, except those persons referred to in section 104(c) of the Act.

(5) The protocol shall address—

(i) Sampling procedures, including equipment and methods to be used;

(ii) Location of sampling points;

(iii) Procedures to establish a baseline analysis of oxygen and methane concentrations at each sampling point over a 14-day sampling period. The baseline shall be established after the atmosphere in the sealed area becomes inert or the trend reaches equilibrium;

(iv) Frequency of sampling;

(v) Size and conditions of the sealed area; and

(vi) Use of atmospheric monitoring systems, where applicable;

(vii) The protocol shall include an action plan that addresses the hazards presented and actions taken when gas samples indicate oxygen concentrations of 10.0 percent or greater for each of the following ranges of methane concentrations—

(A) 3.0 percent or greater but less than 4.5 percent; and

(B) 4.5 percent or greater but less than 17.0 percent; and

(C) 17.0 percent to 20 percent.

(6) The certified person shall promptly record each sampling result, including the location of the sampling points, and oxygen and methane concentrations. The results of oxygen and methane samples shall be recorded as the percentage of oxygen and methane measured by the certified person and any hazardous condition found, in accordance with § 75.363.

(7) The mine operator shall retain sampling records at the mine for at least one year from the date of sampling.

(c) Welding, cutting, and soldering with an arc or flame are prohibited within 150 feet of a seal.

(d) For seals constructed after May 22, 2007, at least two sampling pipes shall be installed in each seal. One pipe shall extend approximately 15 feet into the sealed area and another shall extend into the center of the first connecting crosscut inby the seal. Each sampling pipe shall be equipped with a shut-off valve and appropriate fittings for taking gas samples.

(e) For each set of seals constructed after May 22, 2007, the seal at the lowest elevation shall have a corrosion-resistant water drainage system. Seals shall not impound water.

■ 3. Add § 75.336 to read as follows:

§ 75.336 Seal design applications and installation approval.

(a) Seal design applications from seal manufacturers or mine operators shall be in accordance with paragraphs (a)(1) or (a)(2) of this section and submitted for approval to MSHA's Office of Technical Support, Pittsburgh Safety and Health Technology Center, P.O. Box 18233, Cochrans Mill Road, Pittsburgh, PA 15236.

(1) An engineering design application shall:

(i) Address gas sampling pipes, water drainage systems, air leakage, fire resistance, flame spread index, pressure-time curve, entry size, engineering design and analysis, material properties, construction specifications, quality control, design references, and other information related to seal construction;

(ii) Be certified by a professional engineer that the design of the seal is in accordance with current, prudent engineering practices; and

(iii) Include a Seal Design Table that discusses characteristics related to mine-specific seal construction.

(2) Each application based on full-scale explosion tests shall address the following requirements to ensure that a seal can reliably withstand the overpressures provided by § 75.335:

(i) Certification by a professional engineer knowledgeable in structural engineering that the testing was done in accordance with current, prudent engineering practices and its applicability in a coal mine;

(ii) Technical information related to the methods and materials;

(iii) Proper documentation;

(iv) An engineering analysis to address differences between the seal support during test conditions and the range of conditions in a coal mine; and

(v) The application shall include a Seal Design Table that discusses characteristics related to mine specific seal construction.

(3) MSHA will notify the applicant if additional information or testing is

required. The applicant must provide this information, arrange any additional or repeat tests, and notify MSHA of the location, date, and time of the test(s).

(4) MSHA will notify the applicant, in writing, whether the design is approved or denied. If the design is not approved, MSHA will specify, in writing, the deficiencies of the application, or necessary revisions.

(5) Once the seal design is approved, the approval holder must promptly notify MSHA, in writing, of all deficiencies of which they become aware.

(b) The mine operator shall use an approved seal design provided its installation is approved in the ventilation plan. The mine operator shall—

(1) Retain the seal design approval information for as long as the seal is needed to serve the purpose for which it was built.

(2) Designate a professional engineer to conduct or have oversight of seal installation and certify that the provisions in the approved seal design specified in paragraph (a) of this section have been addressed. A copy of the certification shall be submitted to the District Manager with the information provided in § 75.336(b)(3) and a copy of the certification shall be retained for as long as the seal is needed to serve the purpose for which it was built.

(3) Provide information for approval in the ventilation plan—

(i) The MSHA Technical Support Approval Number;

(ii) The mine map of the area to be sealed and proposed seal locations. This portion of the mine map shall be certified by a professional engineer;

(iii) Specific mine site information, including'

(A) Type of seal;

(B) Safety precautions taken prior to seal achieving full design strength;

(C) Methods to address site specific conditions that may affect the strength and applicability of the seal;

(D) The construction techniques;

(E) Site preparation;

(F) Sequence of seal installations;

(G) Projected date of completion of each set of seals;

(H) Supplemental roof support inby and outby each seal;

(I) Water flow estimation and dimensions of the water drainage system through the seals;

(J) Methods to ventilate the outby face of seals once completed;

(K) Methods and materials used to maintain each type of seal;

(L) Methods to address shafts and boreholes in the sealed area; and

(M) Additional information required by the District Manager.

■ 4. Add § 75.337 to read as follows:

§ 75.337 Construction and repair of seals.

(a) Prior to sealing, the mine operator shall—

(1) Remove insulated cables from the area to be sealed when constructing seals; and

(2) Remove metallic objects through or across seals, except water pipes, gas sampling pipes, and form ties approved in the seal design.

(b) A certified person designated by the mine operator shall directly supervise seal construction and repair and—

(1) Examine each seal site immediately prior to construction or repair to ensure that the site is in accordance with the approved ventilation plan;

(2) Examine each seal under construction or repair during each shift to ensure that the seal is being constructed or repaired in accordance with the approved ventilation plan;

(3) Examine each seal upon completion of construction or repair to ensure that construction or repair is in accordance with the approved ventilation plan;

(4) Certify by initials, date, and time that the examinations were made; and

(5) Make a record of the examination at the completion of any shift during which an examination was conducted. The record shall include each deficiency and the corrective action taken. The record shall be countersigned by the mine foreman or equivalent mine official by the end of the mine foreman's or equivalent mine official's next regularly scheduled working shift. The record shall be kept at the mine for one year.

(c) Upon completion of construction of each seal, a senior mine management official, such as a mine manager or superintendent, shall certify that the construction, installation, and materials used were in accordance with the approved ventilation plan. The mine operator shall retain the certification for as long as the seal is needed to serve the purpose for which it was built.

(d) The mine operator shall—

(1) Notify the local MSHA field office between two and fourteen days prior to commencement of seal construction;

(2) Notify the District Manager, in writing, within five days of completion of a set of seals; and

(3) Submit a copy of quality control results to the District Manager for seal material properties specified by § 75.336.

(e) Miners constructing or repairing seals, certified persons under paragraph (b) of this section, and senior mine management officials under paragraph (c) of this section shall be trained prior to constructing or repairing a seal. The training shall address materials and procedures in the approved seal design and ventilation plan. The mine operator must certify the date of training provided each miner, certified person, and senior mine management official and retain each certification for one year.

■ 5. Add § 75.338 to read as follows:

§ 75.338 Seals records.

(a) The table entitled ''Seal Recordkeeping Requirements'' lists the records the operator must maintain pursuant to §§ 75.335, 75.336, and 75.337, and the duration for which particular records need to be retained.

TABLE TO § 75.338(a).—SEAL RECORDKEEPING REQUIREMENTS

Record	Section reference	Retention time
(1) Protocol to monitor methane and oxygen and maintain an inert atmosphere..	75.335(b)	Same as ventilation plan requirements.
(2) Training of certified persons	75.335(b)(2)	1 year.
(3) Gas sampling records	75.335(b)(6)	1 year.
(4) Approved seal design	75.336(b)(1)	As long as the seal is needed to serve the purpose for which it is built.
(5) Certification of provisions of approved seal design is addressed.	75.336(b)(2)	As long as the seal is needed to serve the purpose for which it is built.
(6) Record of examinations	75.337(b)(5)	1 year.
(7) Seal construction certification	75.337(c)	As long as the seal is needed to serve the purpose for which it is built.

TABLE TO § 75.338(a).—SEAL RECORDKEEPING REQUIREMENTS—Continued

Record	Section reference	Retention time
(8) Certification of training	75.337(e)	1 year.

(b) Records required by §§ 75.335, 75.336, and 75.337 shall be retained at a surface location at the mine in a secure book that is not susceptible to alteration. The records may be retained electronically in a computer system that is secure and not susceptible to alterations, if the mine operator can immediately access the record from the mine site.

(c) Upon request from an authorized representative of the Secretary of Labor, the Secretary of Health and Human Services, or from the authorized representative of miners, mine operators must promptly provide access to any record listed in the table in this section.

(d) Whenever an operator ceases to do business, that operator must transfer all records required to be maintained by this part, or a copy thereof, to any successor operator who must maintain them for the required period.

■ 6. Amend § 75.371 by revising paragraph (ff) to read as follows:

§ 75.371 Mine ventilation plan; contents.

* * * * *

(ff) The sampling protocol as provided by § 75.335(b) and seal installation requirements provided by § 75.336(b)(3).

* * * * *

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