DEPARTMENT OF LABOR

Mine Safety and Health Administration

30 CFR Part 75

RIN 1219–AA11

Safety Standards for Underground Coal Mine Ventilation

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

ACTION: Final rule.

SUMMARY: This final rule revises the Mine Safety and Health Administration's (MSHA's) existing safety standards for ventilation of underground coal mines. After publication of the existing standards, the U.S. Court of Appeals in the D.C. Circuit stayed the application of one standard and MSHA stayed two standards. The rule revises these stayed provisions, revises or clarifies other provisions in the rule and includes some new provisions. The provisions of the final rule are expected to decrease the potential for fatalities, particularly accidents which can result in multiple deaths, and to reduce the risk of injuries and illnesses in underground coal mines. For the convenience of the reader, MSHA has published the full text of the ventilation standards for underground coal mines in this document.

EFFECTIVE DATE: The final rule is effective June 10, 1996.

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SUPPLEMENTARY INFORMATION:

I. Background

The mining of coal underground has historically been recognized as one of the more hazardous occupations in the world. It is a universally recognized principle of underground coal mine safety that there must be proper ventilation of the mine. Indeed, no aspect of safety in underground coal mining is more fundamental than proper ventilation. A basic tenet of mining safety states that ventilation must be sufficient: (1) To dilute, render harmless and carry away the hazardous components of mine air, such as potentially explosive methane; and (2) to provide necessary levels of oxygen to the miners' working environment. Ventilation safety programs are designed around this philosophy. The history of mining is replete with tragic incidents where one aspect or another of a necessary ventilation safety protection was either not in place or not followed, with disastrous results. Examples include the explosion at the Monogah mine in 1907 in which 362 miners perished, the worst mining disaster in the history of the United States. Other more recent examples include the Farmington disaster in 1968 in which 78 miners died, the Scotia mine in 1976 where 26 died, Grundy No. 17 in 1981 where 13 died, Wilberg in 1984 where 27 died, Pyro in 1989 with 10 deaths and Southmountain in 1992 where 8 miners died. In 1969 and again in 1977, Congress recognized the hazards of improper ventilation and established a role for the government in addressing ventilation hazards. MSHA, with the cooperation of labor and industry, has met with a large measure of success in reducing the accidents, injuries and fatalities that have resulted from poor ventilation practices. For example, explosions and fires in a 29 year period from 1940 to 1968 resulted in the deaths of 491 miners. Since the passage of the Federal Coal Mine Health and Safety Act of 1969, 178 explosion and fire related deaths have occurred. While MSHA recognizes that this number is still unacceptable, the significant reduction in loss of life cannot be ignored. To a great extent, the framework for this success has been the implementation of effective ventilation standards.

Preventing recurrence of disasters like those of the past remains the top priority of MSHA. MSHA believes that a serious commitment by management, labor, and government is necessary to develop effective, yet reasonable and practical regulations that protect the safety and health of our nation's miners. MSHA anticipates that this rulemaking, which revises portions of the comprehensive ventilation rule published in 1992 (57 FR 20868, May 15, 1992) and adds new provisions, will bring the coal mining industry closer to that objective.

The comprehensive 1992 ventilation rulemaking was closely followed by interested industry and labor groups, who frequently expressed divergent views on approaches to resolving ventilation issues. Certain commenters exercised their right to challenge the rule and the U.S. Court of Appeals for the D.C. Circuit Court stayed one provision relating to oxygen and carbon dioxide in the bleeder entries. MSHA held a series of informational meetings around the country during which it explained the application of the rule. In so doing, MSHA listened to many questions about the implementation of the rule. MSHA was sensitive to the views expressed at these meetings and gave serious consideration to these issues. Some of these comments became the basis for portions of this rulemaking. Internal discussions of MSHA's experience with the implementation of the rule led MSHA to include still other issues in this rulemaking. In fact, MSHA stayed the application of two additional provisions in response to potential problems pointed out by interested parties. These stayed provisions relate to actions following the stoppage of the main mine fan with persons underground and to a potential fire hazard from the enclosure of compressors in a noncombustible structure. MSHA addresses these issues in the rulemaking. Once MSHA decided that it was going to proceed with a rulemaking to address these issues, it added other provisions to the package to allow all parties an opportunity to comment where they expressed the view that they had insufficient opportunity to comment on the existing rule (The comprehensive rule that was published in the Federal Register on May 15, 1992). The rule MSHA proposed also included issues raised by parties in litigation challenging the existing rule. MSHA anticipates that the final rule should resolve matters included in the challenge raised by the litigation of the existing rule. Finally, in an effort to address confusion that seemed to exist with certain provisions of the existing ventilation rule promulgated in May of 1992, MSHA either proposed clarifications to the existing rule or discussed the affected provisions in the preambles to the proposed and final rules in an effort to clarify them.

The issues in the rulemaking are complex and highly technical. Comments to the proposal (published on May 19, 1994, 59 FR 26536) and comments following the public hearings (held in September and October 1994, in Price, Utah, Logan, West Virginia, and Washington, Pennsylvania) were extensive. One party alone submitted over two thousand pages of written comments and over 275 exhibits. Not only were the safety issues involved complex, but in many cases, MSHA's task was made more difficult by hearing diametrically opposed viewpoints.

Major Improvements in the Final Rule

The final rule provides a number of significant improvements to the existing ventilation regulations. For example, the final rule provides for the electronic storage of records. A major portion of the mining industry has this capability at the present time through computer technology at the mine site. Electronic

record retention can reduce the cost of storage and maintenance of records and provide for ease in access and transfer of information without reducing the protection afforded miners. Additionally, having records electronically stored can facilitate trend analysis, allowing for earlier detection and correction of potential hazards.

The final rule also requires pressure recorders or an option of the use of a fan monitoring system on main mine fans at all mines. This represents a major step toward monitoring the mine fans controlling the ventilation at the mines and helps assure that the miners have uncontaminated air at all times. The final rule also provides for methane testing at the face during mining operations. This technology is especially useful for taking methane tests during extended cut mining operations. The methane testing evaluates air flow to the face to determine that methane is sufficiently diluted, rendered harmless, and carried away so as to reduce or eliminate the hazards associated with methane liberated during mining operations.

Other improvements in the rule include revisions to the three stayed provisions in the existing rule. Air quality levels for oxygen and carbon dioxide in bleeders are established to protect mine examiners who are required to travel to determine if the bleeders are functioning properly. A second stayed provision is revised to limit the use of transportation equipment during the withdrawal of miners after an unintentional fan stoppage. This revision to the existing rule reduces the likelihood of an ignition from methane that can accumulate during the fan stoppage. The third stayed provision is revised to allow the option of attending rather than housing compressors in a noncombustible enclosure. The hazards associated with the operation of compressors in underground mines were demonstrated at the Wilberg mine disaster, where 27 people lost their lives as a result of a compressor fire.

This final rule provides for an alert and alarm device to be located outside of noncombustible structures housing electrical installations. The alert and alarm assures that miners are made aware of a problem in time to extinguish a fire or safely evacuate an area or the mine as necessary for safety. Another change to the existing rule involves miners or their representatives in the mine ventilation plan approval process before the plan is submitted for approval. This provides for the opportunity for input from those having first hand knowledge in the particular mining conditions and practices that impact the plan approval.

Other safety enhancements from the existing rule include: requiring the use of extendable probes to conduct methane tests at deep cuts; requiring on-shift examinations on other than coal producing shifts; and accepting a performance test to determine minimum dimensions at certain locations in escapeways.

Finally, the final rule clarifies existing regulations that were considered vague by some parties or were misunderstood. For example, the final rule provides that certified pumpers can conduct their own examination rather than requiring the examination to be conducted during the preshift segment of the mining operation.

To serve the interests of the mining community, MSHA has republished the full text of subpart D of 30 CFR part 75 as it will read upon promulgation of this rule.

II. Discussion of the Final Rule

A. General Discussion

In developing the final rule, MSHA has made every effort to address the comments received during the rulemaking, and to develop practical requirements for real safety problems. Both the costs and the benefits of each standard were also considered. In addition, each standard, as well as revisions and deletions, was carefully considered against the statutory requirement that nothing in the final rule shall reduce the protection afforded miners by an existing mandatory health or safety standard. Where appropriate, MSHA has provided for a phase in period to allow mine operators time to effectively plan and implement the necessary changes.

MSHA carefully analyzed the comments received and responded in many instances by revising the proposed requirements. For example, unlike the proposal, the final rule does not require the second level countersigning of records; allows the use of nonpermissible equipment when conducting an examination upon restart of a fan following unintentional fan stoppages, and requires pressure recording devices or an option of the use of a fan monitoring system to be used on all main mine fans.

Several commenters strongly urged MSHA to proceed in this rulemaking on the issue of using air coursed through the belt entries (''belt air'') to ventilate the working face. MSHA has completed its consideration of the Report of the Secretary's Advisory Committee Report on Belt Air and has placed the issue of using belt air to ventilate the working face on the rulemaking agenda for development of a proposed rule. Thus, ''belt air'' is not addressed in this rulemaking.

MSHA has also received comments and recommendations on a number of other issues that are outside the scope of this rulemaking. For example, much of the extensive testimony directed toward the use of atmospheric monitoring systems was beyond the issues dealt with in this rulemaking. Also, recommendations for the use of transparent or translucent material for check curtains exceed the scope of this rulemaking. The final rule, therefore, does not include these recommendations.

Commenters to the proposal frequently included a discussion of various accident reports, most written by MSHA. In addition, there were discussions of other documents related to specific incidents or mines, such as MSHA Internal Review Reports or specific mine plans. In some cases, the documents were submitted for inclusion in the record. In other cases, the documents were merely referenced.

MSHA is independently aware of the extensive history of ventilation related explosions, and has considered this information. Where appropriate, this information is discussed in the section-by-section analysis in the preamble of this rule. MSHA is aware that accidents can result from or be contributed to by the violation of one or more of the existing standards. In that context, MSHA has found that the solution is not necessarily to promulgate another standard. (The offender may be as likely to ignore it as well.) Instead, for demonstrated noncompliance with existing standards, the solution is often found in increased emphasis, training, or enforcement, rather than in the promulgation of additional rules.

Several sections of the final rule deal with requirements for sections and areas where mechanized mining equipment is being installed or removed. These provisions, which were included in the existing standard published in May 1992, were reproposed without change for the purpose of receiving additional comments from all interested parties. One commenter cited the William Station mine explosion as evidence of the need for these requirements. Other commenters reiterated an earlier objection that the standards were procedurally flawed. MSHA does not agree that these provisions are procedurally flawed and notes that each of these standards was reproposed and not simply restated as part of this rulemaking. Comments relative to the

technical merits of an individual standard are addressed in the section-by-section portion of this preamble.

Recordkeeping Requirements in the Final Rule

The final rule revises the recordkeeping requirements for several standards. The standards affected are § 75.310, Installation of main mine fans; § 75.312, Main mine fan examinations and records; § 75.342, Methane monitors; § 75.360, Preshift examination; § 75.362, On-shift examination; § 75.363, Hazardous conditions; posting, correcting and recording; § 75.364, Weekly examinations; and § 75.370, Mine ventilation plan; contents.

Generally, the final rule requires examiners to record the results of methane tests as a percent of methane detected; records must be made in a book that is secure and not susceptible to alteration, or electronically in such a manner as to be secure and not susceptible to alteration; and records must be countersigned by the mine foreman by the end of the mine foreman's next regularly scheduled working shift. These rules are intended to assure that examination results are maintained and made available, and that the appropriate level of mine management is made aware of conditions or problems requiring attention. The revisions also help assure the integrity of records and enable mine management to review the quality of the examinations. MSHA intends the term ''secure and not susceptible to alteration'' when applied to electronic storage to mean that the stored record cannot be modified. One example of acceptable storage would be a ''write once, read many'' drive.

Numerous comments were received both supporting and opposing the proposed recordkeeping requirements. MSHA reviewed and fully considered each of these comments. The proposal would have required that records be kept in either state-approved books or in bound books with sequential machine-numbered pages. Commenters argued that under the existing rule records may be falsified or altered. Commenters also stated that accident investigations have demonstrated the need for improved records. Other commenters asserted that the proposed requirement for bound books with sequential machine-numbered pages adds an economic burden for the majority of compliant operators and another way should be found, ''to foil the very few who are recalcitrant.'' Other commenters stated that since all records currently include dates and times, machine-numbered pages are unnecessary.

Some record books that are currently in use and acceptable under the existing standards are vulnerable to misuse or manipulation. For example, under the existing rule, records could be kept in a spiral notebook or even a loose leaf binder. The final rule addresses this issue by requiring that records be made in books that are secure and not susceptible to alteration. Examples of books that are considered by MSHA to be secure and not susceptible to alteration include, but are not limited to, record books that are currently approved by state mine safety agencies, and permanently bound books. Examples of books that would not be considered books that are secure and not susceptible to alteration include loose leaf binders and spiral note books.

Several commenters advocated the use of computers for the storage and retrieval of records. In support of this approach, the commenters cited computer records as being highly accurate, requiring less storage space and facilitating data retrieval. Other commenters expressed concern for the security of records stored electronically, and offered examples of breaches of security in record systems at banks and national security installations as evidence to support this concern.

Electronic storage of information and assessing it through computers is more and more a common business practice generally and in the mining industry. Recognizing this trend, the final rule permits the use of electronically stored records provided they are secure and not susceptible to alteration, are able to capture the information and signatures required, and are accessible to the representative of the miners and the representatives of the Secretary. Based on the rulemaking record, MSHA believes that electronic records meeting these criteria are practical and as reliable as traditional records.

In the preamble to the proposal, MSHA expressed its intent to require a hard copy printout of the information stored electronically to be available within 1 hour of a request, and to require backing up of the information within 24 hours. Commenters objected to making the records available within 1 hour as being too stringent and unnecessarily requiring a person to be on duty at all times. MSHA agrees that the requirement would be overly burdensome and has not included it in the final rule. Similarly, MSHA has not included a specific requirement for backing up the computer data. The final rule requires that the records be secure. This encompasses backing up the data as appropriate to the conditions and electronic storage system used at the mine. Upon reconsideration, MSHA has concluded that an additional specific requirement would be an unnecessary burden and has not included it in the rule.

A variety of comments were received regarding the countersigning of certain records by the mine foreman, and the time frame permitted for countersigning. The final rule adopts the proposal that the mine foreman must countersign the record by the end of the mine foreman's next regularly scheduled working shift. The mine foreman is the person most responsible for the day-to-day operation of the mine. It is essential for the health and safety of the miners that the mine foreman be fully aware of the information contained in examination reports so as to be able to allocate resources to correct safety problems as they develop. Allowing until the end of the mine foreman's next regularly scheduled working shift to countersign the reports assures that the mine foreman is aware of the results of the examination in sufficient time to initiate corrective actions. In response to commenters, the final rule allows a mine official equivalent to a mine foreman to countersign the records.

Some commenters suggested that the time for countersigning is unnecessarily long, and that the final rule should restore a previous requirement that countersigning be completed ''promptly.'' The term ''promptly'' involves a level of ambiguity that is eliminated by specifying the time for countersigning records. The record does not show that the time set by the final rule would expose miners to safety or health risks. Also, hazardous conditions are required to be corrected immediately.

Commenters suggested that the term ''mine foreman'' be replaced by a ''certified person responsible for ventilation of the mine or his designee.'' Another commenter suggested that the record could be countersigned by the mine foreman or any other mine official responsible for the day-to-day operation of the mine. Commenters stated that some operations no longer use the terms ''mine foreman'', ''mine manager,'' or ''superintendent.'' To provide for alternative management titles, the final rule incorporates the phrase ''or equivalent mine official.''

Numerous comments were received regarding the requirement of the proposal for second level countersigning by the mine superintendent, mine manager, or other mine official to whom the mine foreman is directly accountable within 2 scheduled

production days thereafter. Commenters objecting to the proposal stated that higher level management should be able to delegate responsibility, noting that often this level of official has more than one mine to oversee and may not necessarily be available within the proposed two days. One commenter suggested allowing three days for second level countersigning in order to recognize that such an official often has numerous obligations and to allow for normal absences. Other commenters simply recommended that the second level countersigning be deleted.

Another commenter stated that some states hold the mine foreman legally responsible, that the mine foreman should correct hazardous conditions immediately and withdraw miners as appropriate, and that the second level countersigning would add no measure of safety. One commenter noted that in many cases the mine manager or superintendent is not a certified individual and long periods may elapse during which this person does not go underground. In these instances, the person countersigning would have little or no understanding or first hand knowledge of the conditions in the mine. Commenters stated that countersigning by the mine foreman is adequate notification to the operator of any deficiency and that the mine foreman has the necessary resources and responsibility to correct any situation noted in the records.

Other commenters supported the proposal noting that second level countersigning would provide an additional level of accountability. These commenters also suggested that in the event of a major accident, the second level countersigning requirement would be important in fully assessing the contributing causes.

MSHA has determined that countersigning by the mine foreman or equivalent mine official, as specified in the final rule, provides the means necessary to detect and correct developing hazards in a mine. Countersigning by the mine foreman assures the necessary notification to an official with the knowledge of the day-to-day operation of the mine having the authority to maintain the mine in a safe operating condition. Agency experience has demonstrated that higher level mine officials commonly lack hands-on involvement or in-depth knowledge of the specific conditions underground or how the highly detailed ventilation rules impact upon those conditions. Therefore, countersigning by a mine official at a higher level does not assure any additional level of safety and imposes an unnecessary burden.

B. Section-by-Section Discussion

The following section-by-section portion of the preamble discusses each provision affected. The text of the final rule is included at the end of the document.

Section 75.301 Definitions

The final rule revises the definition of return air to permit operators to designate certain air courses as return air courses for the purpose of ventilating structures, areas or installations that are required to be ventilated to return air courses and for ventilating seals when the air in the air course will not be used to ventilate working places. Thus, an operator wishing to split air off of an intake for the purpose of ventilating shops, electrical installations, or for other purposes, could designate the air course into which the split is directed as a return provided the air in the air course would not be used to ventilate working places or other locations, structures, installations or areas required to be ventilated with intake air. Commenters generally agreed with the change. However, one commenter expressed the concern that air currents ventilating electrical installations could be coursed to the conveyor belt entry before being coursed to a redesignated return air course, and thus not vented directly to a return. The commenter expressed the opinion that because the air is not vented directly to a return under this scenario, the rule would not permit this practice. MSHA does not agree with the commenter's interpretation and the final rule, consistent with § 75.340, permits this practice.

MSHA does not anticipate that operators will need to redesignate air courses on a routine basis. When questions arise as to the need to redesignate an intake as a return, the operator should contact the local MSHA office. In order that all interested persons are made aware when an air course is redesignated, the final rule requires in § 75.372, Mine ventilation map, that such redesignated air courses be shown on the mine's ventilation map.

Section 75.310 Installation of Main Mine Fans

The main mine fans serve a vital role in providing ventilation to prevent methane accumulations and possible explosions as well as providing miners with a healthful working environment. Section 75.310 is primarily directed at protecting the main mine fans from fires and damage in the event of an underground explosion so that necessary ventilation can be maintained. Monitoring of the fans to assure that they are operating properly is an element of this protection. The final rule for § 75.310 revises paragraphs (a) and (c) of the existing rule. The revisions address: (1) automatic signals for fan stoppage, (2) pressure recording devices, and (3) main mine fan monitoring systems.

Paragraph (a)(3) of § 75.310, like the proposal, requires each main mine fan to be equipped with an automatic device that gives a signal at the mine when the fan either slows or stops. The existing rule does not specify where the signal is to be given. Commenters supported the proposal stating that a signal alarming at a location away from the mine site would rely on overland communication lines to transmit the signal, with the person receiving the signal then notifying the mine. These overland communication lines are subject to weather and other potential sources of damage, which could result in a disruption of the communication. Other commenters objected to the proposal, however, stating that the ability of a mine operator to consolidate monitoring of several mines at one single location is a very efficient and cost-effective practice and should not be arbitrarily prohibited. Further, they stated that there would be absolutely no delay in contacting the miners from this central location should a fan malfunction occur. For clarity and for increased safety, the final rule requires that the signal be given at the mine. MSHA believes that in the case of a fan stoppage, this will assure more timely notice to miners, and hence, a more effective safety response. The requirement that the signal be given at a surface location at the mine does not preclude the signal from also being given elsewhere, such as at a central office, as long as it is given at the mine.

Paragraph (a)(3) of § 75.310 requires that a responsible person, designated by the operator, shall always be at a surface location at the mine where the signal can be seen or heard while anyone is underground. In addition, the responsible person must be provided with two-way communication with working sections and with other established locations where persons are normally assigned to work. Commenters supported the proposal stating that the changes provide clarification and specificity. Other commenters agreed with the proposed concept of two-way communication but felt that the wording, ''established locations where persons are normally assigned to work'' is ambiguous and subject to misinterpretation. Some commenters

objected to the proposed requirement stating that (1) it is redundant of § 75.1600 Communications; (2) properly the subject of a separate rulemaking under § 75.1600 or; (3) it is vague, ambiguous, or subjective. Section 75.1600 only requires two-way communication between the surface and working sections and does not identify that this communication must be provided to a location where a person can see or hear the fan alarm signal. Commenters suggested that the requirement be revised to more specifically quantify locations where persons are normally assigned to work. MSHA recognizes that, as proposed, the standard might result in misinterpretation and the final rule has been reworded to read, ''* * * two-way communication with working sections and work stations where person(s) are routinely assigned to work for the majority of a shift.''

Some, but not all, outby areas where two-way communication would be required by the final rule include; shops, attended belt transfer points, attended rail car loading points, and attended underground coal storage bins and hoppers. It is not intended that this communications capability be provided in areas where secondary roof support is being installed or where rock dust is being applied, or at unattended underground pumps, or in areas such as return air courses, bleeder entries and conveyor belt haulageways other than at belt transfer points. The requirement that two-way communication be provided to work stations where persons are routinely assigned to work for the majority of a shift is intended to help assure that these persons receive prompt notification of fan stoppages. Because these work stations are off the working section, a lack of communication capabilities could result in delays in notification and therefore delays in egress from the mine.

Paragraph (a)(4) of the existing rule requires that main mine fans be equipped with a pressure recording device or with a main mine fan monitoring system but exempts from this requirement mines permitted to shut down main mine fans under § 75.311.

The final rule eliminates this exemption and requires that all main mine fans be equipped with a pressure recording device or a main mine fan monitoring device. For mines not currently required to have such a device, MSHA has provided for a 1 year phase in period to allow mine operators time to effectively plan and implement the necessary changes. One commenter suggested that all main mine fans at all mines be required to operate continually and further suggested that all main mine fans be equipped with pressure recording devices and main mine fan monitoring systems. In support of this suggestion, the commenter stated that continuous fan pressure recording devices would have a positive impact on safety at these operations. Such devices will provide necessary information to operators and miners at operations affected by this change. MSHA has not included one commenter's suggestion that main mine fan monitoring systems be required for all main mine fans. While MSHA supports and encourages the use of this advanced technology the Agency does not believe that it is appropriate to mandate it for all mines because daily fan examinations coupled with pressure recording devices have proved to be adequate over the years. Also, MSHA does not adopt a suggestion that main mine fans at all mines be required to operate continuously.

Paragraph (a)(4) of the final rule requires that when a pressure monitoring device is used in lieu of a pressure recording device, it must produce a continuous graph or chart of the fan pressure. A hard copy of the continuous graph or chart must be printed at regular intervals of not more than 7 days. This provision permits the use of relatively recent advances in technology for monitoring main mine fan pressure provided a continuous record of the fan pressure is provided. In the proposal, MSHA specifically solicited comments as to an appropriate polling frequency that would provide a record that is substantially continuous. In response to this request, one commenter proposed that a polling frequency of two seconds is necessary to take full advantage of available technology. This commenter stated that continuously means constant or unbroken and that a continuous record should require a polling frequency of not greater than 2 seconds. Another commenter, an instrument manufacturer, suggested that a one minute sampling interval is definitely feasible. Main mine fan monitoring, when used, is often part of a more comprehensive mine-wide atmospheric monitoring system (AMS), and to require that the fan be polled every two seconds could delay the polling of other important sensors. Additionally, because these pressure monitoring devices are intended to be used in lieu of the traditional circular pressure recorder they must provide a substantially equivalent record. Experience by MSHA engineers following mine explosions and during more routine ventilation survey work has shown that the accuracy to which a 7-day, circular recording chart of the type normally used can be read is on the order of several minutes. MSHA would expect that the polling frequency for a pressure recording device used in lieu of a pressure recorder would be no more than one (1) minute.

MSHA received a number of comments in response to the proposed requirement in paragraph (a)(4) that when a pressure recording device other than a circular pressure recorder is used, a hard copy of the continuous graph or chart be generated at not more than 7-day intervals. Comments ranged from requiring daily printouts to not requiring any printout except when requested by an Authorized Representative of the Secretary. In response to these comments, the final rule retains the requirement for a hard copy of the continuous graph or chart be generated at not more than 7-day intervals. In light of MSHA's stated position to permit records of examinations to be stored electronically, the final rule permits the record of main mine fan pressure to be stored electronically provided the record is secure and not susceptible to alteration.

Paragraph (c) of § 75.310 specifies requirements for main mine fan monitoring systems if used under § 75.312. Commenters suggested that the requirements were repetitive, confusing, and would discourage mine operators from using monitoring systems which could provide more protection. MSHA believes that the requirements in paragraph (c) are necessary to effectively monitor a fan, particularly when these systems are used in lieu of daily fan examinations.

Paragraph (c)(3) of § 75.310 of the proposal would have required that main mine fan monitoring systems provide, on demand, a printout of the monitored parameters, including the mine ventilating pressure. Several commenters objected to the requirement that a printout be provided ''on demand.'' As interpreted by these commenters, this standard would require that the operator provide a printout at any time it is requested. As explained in the preamble to the proposal, ''* * * the monitoring system would be required to have the *capability of providing* (emphasis added), on demand, a printout of the information being monitored. This capability is intended to facilitate the review of the information by mine management required in § 75.312(b).'' The commenters misinterpreted the purpose for the standard. MSHA recognizes,

however, the merits of being able to obtain a printout within a reasonable period of time. Therefore, the final rule requires that a main mine fan monitoring system used to satisfy the requirements of § 75.312 provide a printout of the monitored parameters, including the mine ventilating pressure, within a reasonable period, not to exceed the end of the next scheduled shift during which miners are underground.

Paragraph (c)(5) of § 75.310 requires that two-way communication be provided between a surface location at the mine where the signals from the fan monitoring system can be seen or heard and working sections and other established locations where persons are normally assigned to work for the majority of the shift. Except for minor editorial changes, this requirement is the same as the proposal. Comments on this proposal were the same as comments on proposed paragraph (a)(3). Several commenters supported the proposal stating that the changes provide clarification and specificity. Other commenters agreed with the proposed concept of two-way communication but felt that the wording, ''established locations where persons are normally assigned to work'' is ambiguous and subject to misinterpretation. Some commenters objected to the proposed requirement stating that (1) it is redundant of § 75.1600 Communications; (2) properly the subject of a separate rulemaking under § 75.1600 or; (3) it is vague, ambiguous, or subjective. Section 75.1600 only requires two-way communication between the surface and working sections and does not identify that this communication must be provided to a location where a person can see or hear the fan alarm signal. Commenters suggested that the requirement be revised to more specifically quantify locations where persons are normally assigned to work. MSHA recognizes that, as proposed, the standard might result in misinterpretation and the final rule has reworded the proposal to read, ''* * * two-way communication with working sections and work stations where person(s) are routinely assigned to work for the majority of a shift.''

Some, but not all, outby areas where two-way communication would be required by the final rule include; shops, attended belt transfer points, attended rail car loading points, and attended underground coal storage bins and hoppers. It is not intended that this communications capability be provided in areas where secondary roof support is being installed or where rock dust is being applied, or at unattended underground pumps, or in areas such as return air courses, bleeder entries and conveyor belt haulageways other than at belt transfer points. The requirement that two-way communication be provided to work stations where persons are routinely assigned to work for the majority of a shift is intended to help assure that these persons receive prompt notification of fan stoppages or other problems with the fan that might require withdrawal of miners. Because these work stations are off the working section, a lack of communication capabilities could result in delays in notification and therefore delays in egress from the mine.

Section 75.311 Main Mine Fan Operation

The main mine fan provides the pressure that causes air to move through the mine to dilute and carry away explosive and toxic gases, dusts and fumes. As such it is the most important part of the ventilation system. Section 75.311 requires fans to be continuously operated to provide constant ventilation to underground areas and specifies precautions for planned fan stoppages. It also addresses the repair of main mine fans, monitoring of fan signal devices on the surface, and protection against fires around fans and intake air openings.

The final rule revises paragraph (d) of § 75.311, which addresses the notification of mine officials of any unusual variance in mine ventilation pressure and requires the prompt repair of electrical or mechanical deficiencies. The final rule requires immediate notification and the prompt institution of corrective action or repairs.

Commenters suggested deletion of the word ''unusual'' maintaining that this term makes the requirement vague and subject to different interpretations. These commenters suggested substituting the phrase, ''that could materially affect the safety and health of persons in the mine'' to describe the type of pressure variance that would require action. In making this recommendation, the commenters cited similar language in existing § 75.324(a)(1) that, according to the commenters, is understood throughout the coal mining community. Section 75.324(a)(1) concerns alterations of the main ventilation air current or any split of the main air current. The final rule does not adopt this recommendation. Minor fluctuations in fan operating pressure are normal; however, unusual changes can be indications of changes in fan operation or changes underground, such as roof falls or loss of ventilation controls, that require prompt attention and corrective action. In addition, MSHA has 25 years of experience with the phrase ''unusual variances in mine ventilation pressure'' and is unaware of significant difficulties with this terminology.

Commenters questioned what constitutes an ''electrical or mechanical deficiency'' for the purposes of § 75.311. The purpose of the standard is to assure that a problem with main mine fans is corrected promptly and that the proper persons are notified that the problem exists. The types of electrical or mechanical deficiencies requiring action under paragraph (d) are those that can interfere with mine ventilation. In addition, MSHA has 25 years of experience with the phrase ''electrical and mechanical deficiencies'' and is, again, unaware of any significant difficulties with the use of this terminology during this time frame.

Commenters also addressed the proposal that the ''mine superintendent, assistant mine superintendent, or mine foreman'' be notified immediately when an unusual variance in mine ventilation pressure is observed, or when an electrical or mechanical deficiency in a main mine fan is detected. The final rule does not retain the mine superintendent or the assistant mine superintendent as mine officials to be notified. Commenters stated that this provision provides a measure of safety to the miners by requiring that specific mine managers be notified of possible main mine fan problems, while the existing standard specifies that such a situation must be investigated. Other commenters, however, suggested that the persons identified for notification under the proposal may not be the most qualified to handle the problem. They also indicated that the notification requirement could unnecessarily delay appropriate action by other responsible persons. The commenters further stated that the mine superintendent or assistant mine superintendent may not be at the mine and that a certified person would be in charge who should be permitted to take the appropriate action. The proposed requirement that certain mine managers be notified immediately was not intended to require that these individuals personally take the necessary actions to respond to the problem with the main mine fan. Neither was it intended that they be notified of such a problem, to the exclusion of all others. The objective of the rule is to assure that the appropriate actions are taken as soon as possible. Additionally, notification of specified mine officials is intended to assure that those persons who are responsible for the mine are aware of the problem. The

final rule, therefore, retains the requirement that certain mine managers be notified of any unusual variance in the mine ventilation pressure or if an electrical or mechanical deficiency of a main mine fan is detected.

The final rule does, however, delete reference to notification of the mine superintendent or assistant mine superintendent. As discussed in relation to the countersigning of records, the mine superintendent is quite often not a certified person and is only periodically present at the mine. In addition, consistent with other sections of the final rule and recognizing that the term mine foreman is not used at some mines, the final rule requires that if an unusual variance in the mine ventilation pressure is observed, or if an electrical or mechanical deficiency of a main mine fan is detected, the mine foreman or equivalent mine official, or in the absence of the mine foreman or equivalent mine official, a designated certified person acting for the mine foreman or equivalent mine official shall be notified immediately. As with the proposal, the final rule requires that appropriate action or repairs shall be instituted promptly. It is not intended that the appropriate action or repairs be delayed until the mine foreman or equivalent mine official is notified.

During a series of informational meetings held by MSHA following publication of the existing rule, questions arose concerning the operation of back-up fans. For informational purposes, the preamble to the proposal included a detailed discussion of questions about the operation of back-up fans under the ventilation regulations and solicited comments. MSHA did not propose any rule changes, nor does the final rule contain specific provisions for back-up fans. When a back-up fan operates in place of the main mine fan, the back-up fan is considered to be a main mine fan and all subpart D requirements for main mine fans are applicable.

Section 75.312 Main Mine Fan Examinations and Records

Proper operation of main mine fans is critical to mine ventilation and the prevention of methane accumulations and possibly methane explosions. Recognizing the importance of the main mine fan, § 75.312 requires that each main mine fan be examined at least once each day that the fan operates unless the fan is continuously monitored with a main mine fan monitoring system. Through daily examinations or continuous monitoring of critical parameters, the operator can determine if problems with the fan are developing and correct these problems before ventilation is affected.

The final rule removes existing paragraph (g)(2), revises existing paragraphs (a), (b)(1), (c), (d), (g)(1) and (h), redesignates existing paragraph (f) as (f)(1), and adds new paragraphs (f)(2) and (g)(2). Paragraph (a) of the final rule, like the existing rule, requires daily examination of main mine fans unless a fan monitoring system is used. In addition, paragraph (a) specifies that an examination of the main mine fan is not required on days when no person goes underground. An examination of the fan, however, is required prior to anyone entering the mine. The purpose of this examination, as stated in paragraph (a), is to assure the electrical and mechanical reliability of the fan.

When a fan monitoring system is used, the final rule requires a daily review of the data from the monitoring system to be made, except on days when no person goes underground. A review of the data from the monitoring system must be completed, however, prior to anyone entering the mine.

Fan examinations or review of fan monitoring system data are required to be performed by a trained person designated by the operator.

Commenters questioned the use of the term ''assure'' in paragraph (a) when referring to the electrical and mechanical reliability of main mine fans. MSHA uses the term ''assure'' in this context as defined in *Webster's Third New International Dictionary,* Unabridged, 1993 edition, to mean, ''to make safe, to give confidence to.'' The sense of this definition is consistent with the intended purpose of the examination. The term does not mean to ''guarantee'' safety, as suggested by one commenter.

Commenters suggested that the final rule require the examination of main mine fans for proper operation be conducted by an individual trained as part of the mine operator's training plan required by MSHA's comprehensive training regulation in part 48 of 30 CFR. Other commenters understood the proposal to require training of fan examiners under part 48, and objected to such a requirement. These commenters suggested that the person conducting the fan examination be one who has received training through experience or has been trained by an experienced person, or by the fan manufacturer. The final rule does not require fan examiners to be trained as part of the operator's part 48 training plan. Instead, the final rule specifies that fan examiners must be trained sufficiently to have the skill and knowledge to ascertain whether the fan is in proper working order, mechanically and electrically.

Paragraph (a) requires a daily physical examination of the main mine fan, unless a fan monitoring system is used. If a fan monitoring system is used, paragraph (b) requires a weekly physical examination of the main mine fan, a weekly test of the monitoring system, and a daily review of the main mine fan monitoring data. Commenters suggested that even if a main mine fan is equipped with a monitoring system, the fan should still be subject to daily physical examinations because a fan monitoring system is not capable of disclosing all conditions that a physical inspection could disclose. The final rule does not adopt this suggestion. A weekly physical examination of the fan and a test of the monitoring system coupled with a daily review of the monitoring data provides reasonable assurance that a mine fan is operating reliably. Commenters suggested that the proposed requirement of paragraph (b)(1) requiring a daily review of main mine fan monitoring system data is unnecessary and redundant. These commenters suggested that the system need only be capable of producing a printout because the systems would automatically alarm anytime an electrical or mechanical deficiency exists. Requiring a daily review of the monitoring system data, according to these commenters, could discourage the use of improved technology. Other commenters noted that operators currently using fan monitoring systems conduct a daily review of the data at the present time and that the requirements to review the data would provide an additional measure of safety for the miners. MSHA believes that a daily review of data from fan monitoring systems is needed to assure that mine management is made aware of any operational changes or trends in monitored parameters. Main mine fans provide the source for mine ventilation and, therefore, are critical to miners' safety. As discussed earlier, these daily reviews of data are designed to complement the physical examinations of the fan.

The final rule adopts the requirements of proposed paragraphs (b)(1)(ii) (A) and (B) and requires that when a fan monitoring system is used as provided under paragraph (a), a trained person designated by the operator must test the system for proper operation at least every 7 days. Commenters objected that it is redundant because a fan monitoring system is capable of monitoring itself and can automatically provide a warning when a fan malfunction occurs. These commenters also stated that if the

system is continuously operated, the system is self-tested for proper operation several times a minute and that the 7-day test is unnecessary. The commenters suggested that the 7-day test only be conducted if the fan monitoring system is not continuously operated. For continuously operating fans an examination of the fan should more appropriately be conducted monthly, according to these commenters. Requiring more frequent checks the commenters maintain would discourage the use of fan monitoring systems.

The final rule does not adopt these suggestions. While MSHA encourages the use of fan monitoring systems, excessive reliance on the self-monitoring features of these systems is incompatible with the importance of reliable operation of main mine fans. MSHA does not anticipate that the final rules for examination requirements will discourage the use of fan monitoring systems. Main mine fans without a monitoring system are required to be examined daily, while fans with monitoring systems are required to be examined every seven days.

Paragraphs (c) and (d) of § 75.312 of the final rule continue in effect the requirements that tests of the automatic fan signal device and automatic closing doors, when these doors are required, be conducted at intervals not to exceed 31 days. The specified means of testing these devices and doors is by stopping the fan. The proposal would have permitted an alternative test not involving stopping the fan if the alternative method provided the same level of assurance that the signal device or door would function as intended during fan stoppages. Two commenters favored the proposal and suggested that there is no need to approve alternate means of testing fan signal devices in the mine ventilation plan. These commenters expressed the opinion that each authorized representative should be capable of ascertaining the validity of the alternative method. The commenters did not make a similar suggestion relative to the alternative means provision proposed in paragraph (d) for automatic closing doors. Another commenter opposed the use of alternative tests stating that it would be premature to adopt a provision for an alternative test to stopping the fan when such a test has not as yet been developed. MSHA has reconsidered the proposal and the final rule continues to require that the tests of fan signal devices and automatic closing doors be conducted by stopping the fan. Should an operator develop an alternative method that provides the same level of protection as stopping the fan, the petition for modification process is available for an operator to obtain approval.

Paragraphs (c) and (d) permit underground power to remain energized during fan signal and automatic closing door testing, notwithstanding the requirements of § 75.311. If the fan is not restarted within 15 minutes, the final rule requires that underground power be deenergized and no one is permitted to enter any underground portion of the mine until the fan is restarted and an examination is conducted. Additionally, paragraphs (c) and (d) require that only persons necessary to evaluate the effect of the fan stoppage or restart, or to perform maintenance or repair work that cannot otherwise be done while the fan is operating, are permitted underground.

Some commenters objected to limiting the persons who can be underground during fan signal and closing door tests. Other commenters objected to anyone being permitted underground during the stoppage of a fan to conduct the required tests. These commenters expressed the opinion that all necessary work can be performed with the fan operating and therefore, when a fan is shut down to test the fan signal device or the automatic closing doors no one should be underground.

Some work, such as working immediately inby a blowing fan, could place workers at risk by exposing them to extreme temperatures, effects of the high velocity air stream, or excessive noise levels when the fan is operating. In addition, repair work within a shaft can more safely be done when a fan is stopped. The rule, therefore, retains the exception that permits persons underground during intentional fan stoppages to evaluate the effect of the fan stoppage or restart, or to perform maintenance or repair work that cannot otherwise be done while the fan is operating.

Paragraphs (c) and (d) of the final rule are reworded to clarify that during the required tests, power circuits may remain energized only if no person is underground. Therefore, if an operator elects to evaluate the effect of the fan stoppage or restart, or to perform maintenance or repair work that cannot otherwise be done while the fan is operating, simultaneous with the tests required, power circuits must be deenergized in accordance with § 75.311(b)(3). Additionally, in accordance with § 75.311(b)(2), all mechanized equipment must be shut off.

Paragraph (f)(1) of the final rule retains the longstanding requirement that the person performing main mine fan examinations certify by initials and date at the fan or another location specified by the operator that the examinations were made. Each certification is required to identify the main mine fan that was examined. When daily fan examinations are conducted, daily certification is required. When a main mine fan monitoring system is used and fan examinations are conducted at 7 day intervals, certification is required each time the fan is examined.

One commenter offered suggested wording that would eliminate the option of certifying that the examination was completed at a location other than the fan being examined. This suggestion has not been adopted and the final rule retains the flexibility for certifications to be made away from the fan.

Paragraph (f)(2) of the final rule requires that when a main mine fan monitoring system is used, a daily printout of the system's data must be certified to indicate that the daily review was completed. While some commenters generally agreed with this requirement other commenters suggested that an alternative should be provided for systems which are continuously operated and supervised. In such cases, the commenters suggested that immediate notification of the mine foreman when a deficiency arises would be appropriate, together with maintaining the internal records of data gathered by the systems for one year.

The suggested alternative is not included in the final rule. MSHA believes that documentation that monitoring system data is being reviewed is necessary to provide reasonable assurance that mine management is aware, on a timely basis, of the operating condition of the fan being monitored. However, to reduce the burden of this requirement, the final rule in paragraph (f)(2) does permit the electronic certification of the review of the data generated by a fan monitoring system. As with electronically kept records, the rule would require that the electronic certification include handwritten initials and dates. A discussion of comments concerning the use of computers to maintain records can be found in the General Discussion of this preamble.

Paragraph (g)(1) of § 75.312 requires that by the end of the shift on which the examination is made, persons making main mine fan examinations must record all uncorrected defects found during the examination that may affect the operation of the fan. The rule also specifies that records be maintained in a book that is secure and not susceptible

to alteration, or electronically in such a manner as to be secure and not susceptible to alteration. The proposal would have required all defects found during the main mine fan examination that may affect the operation of the fan to be recorded whether corrected or uncorrected.

Some commenters objected to recording defects that ''may'' affect the operation of the main mine fan, and suggested only defects that do affect the operation of the main mine fan and that are not corrected by the end of the shift, need to be recorded.

Some commenters asserted that a record of ''all'' defects should be required in order to identify recurring problems that may lead to bigger problems. These commenters interpreted the proposal to require such a record. The final rule is intended to address problems found during fan examinations that may indicate more serious defects and ultimately lead to a fan failure and that cannot be corrected by the end of the shift. The objective is to record defects of a nature and seriousness that could result in a fan failure, but not to record defects that are so minor that it would be unreasonable to expect fan failure to result. Another commenter stated that recording all defects that may affect fan operation would result in excessive paperwork of little value. This commenter also suggested that if mine ventilation does become ineffective, the workers are to be withdrawn from the mine. MSHA is sensitive to concerns about recordkeeping. Therefore, the final rule requires that all uncorrected defects which are found during the examination that may affect fan operation be recorded. In this manner, miners on the oncoming shift are aware of problems with the fan that potentially could impact underground ventilation.

Commenters supported the use of electronic media as a substitute for specific types of record books. Commenters pointed out that almost all such systems incorporate recordkeeping functions and that significant variances from the norm are easily noted. They concluded that the computer monitoring systems provide superior protection for the miners. The final rule permits, in paragraph (g)(1), the use of electronically stored records for main mine fan examinations provided the records are secure, are able to capture the information and signatures required, and are accessible to the representative of the miners and the representatives of the Secretary.

As with other records required by this rule, paragraphs (g)(2) and (g)(3) require that records required by § 75.312 must be made in books that are secure and not susceptible to alteration, or electronically in such a manner as to be secure and not susceptible to alteration. A detailed discussion of record books and the use of computers to maintain records can be found in the General Discussion of this preamble.

Paragraph (g)(2) of the existing rule requires that at mines permitted to shut down main mine fans under § 75.311, if a pressure recording device is not used, a record shall be made, in a book maintained for that purpose, of the time and fan pressure immediately before the fan is stopped, and after the fan is restarted and the fan pressure stabilizes. The final rule does not retain this requirement in light of the new requirement of § 75.310(a)(4) that all main mine fans be provided with a pressure recording device or an option of the use of a fan monitoring system. This new requirement eliminates the need for an additional record of the time and fan pressure made immediately before the fan is stopped and after the fan is restarted and the fan pressure stabilizes. This information is obtained from the pressure recording chart, which records the pressure continuously and automatically, thus maintaining the protection afforded the miners.

Paragraph (h) of the final rule requires that the records required by § 75.312 be maintained at a surface location at the mine for one year and be made available for inspection by authorized representatives of the Secretary and the representative of miners. Comments were generally favorable on this proposal. A discussion of comments concerning the use of computers to maintain records can be found in the General Discussion of this preamble.

As with the other provisions of the final rule allowing electronic certification or recordkeeping, sufficient protections have been included so that there is no reduction in protection from the existing standards.

Section 75.313 Main Mine Fan Stoppage With Persons Underground

Section 75.313 was stayed by MSHA as explained in the introductory section of this preamble. Generally, this standard is concerned with protecting miners from the danger introduced when the main mine fan stops, such as when there is a loss of power. Under these circumstances, mine ventilation is interrupted, permitting gases such as methane to accumulate. These conditions can lead to an explosion ignited by electric circuits or the operation of equipment.

Paragraph (a)(3) of the final rule requires that if a main mine fan stops, everyone shall be withdrawn from the working sections and from areas where mechanized mining equipment is being installed or removed. The language of the final rule is identical to the wording of stayed § 75.313 (a)(3). An in-depth discussion of provisions concerning the installation and removal of mechanized mining equipment is presented in the General Discussion section of this preamble.

The final rule revises paragraphs (c)(2), (c)(3), (d)(1)(i) and, (d)(1)(ii) of the stayed standard. Paragraphs (c)(2) and (c)(3) require that when a main mine fan stops with persons underground, the underground electric power circuits shall be deenergized and mechanized equipment shall be shut off. These rules further recognize an exception to facilitate miners' evacuation from the mine. The exception temporarily permits some circuits to remain energized and some mechanized equipment to not be shut off, provided these circuits and mechanized equipment are necessary to withdraw persons from the mine and are located in areas where methane is not likely to migrate to or accumulate. These circuits must be deenergized and the mechanized equipment must be shut off as persons are withdrawn. The final rule differs from the stayed standard by limiting the exception permitting the use of these circuits or equipment to areas where methane is not likely to migrate to or accumulate.

Paragraph (d)(1)(i) requires that when a fan stoppage lasts for more than 15 minutes a preshift-type examination must be conducted before persons other than designated examiners, are permitted to enter any underground area of the mine. Examiners are permitted to re-enter the underground area of the mine from which miners have been withdrawn only after the fan has operated for at least 15 minutes unless a longer period of time is specified in the mine ventilation plan. Paragraph (d)(1)(ii) requires that when a fan stoppage lasts for more than 15 minutes, underground power circuits are not to be energized and nonpermissible mechanized equipment is not to be started until a preshift-type examination is conducted, except that designated certified examiners may use nonpermissible transportation equipment in intake airways to facilitate the conduct of the required examination.

Some commenters suggested that actions following fan stoppages are best handled on a mine-by-mine basis through a plan approval process. Along

these lines, commenters suggested that the fan stoppage plan approval process previously used by MSHA should be used with only minor modification to assure that plans do not become standardized, that is, model the rule on a past standard with criteria for approval of fan stoppage plans. Other commenters, while supporting the concept of fan stoppage plans, proposed to tie the submission and approval of such plans to total mine ventilation surveys and computer simulations conducted by the operator every three months. According to one commenter the data provided by these surveys would be used to determine the adequacy of a fan stoppage plan.

The final rule does not adopt the suggestions of the commenters for mine fan stoppage plans. One objective in this rulemaking is to reduce the need for paperwork, such as plans, where reasonable, uniform requirements can be developed. The final rule establishes the general requirement that after a fan stoppage lasting more than 15 minutes, mine power and equipment is to be shut down. However, experience shows that using transportation equipment to facilitate mine evacuation is often necessary, provided this is done where gas is not likely to accumulate, and circuits are deenergized on the way out of the mine.

Some commenters suggested that the requirements in paragraphs (c)(2) and (c)(3) limiting the use of transportation equipment to areas and haulageways ''where methane is not likely to migrate to or accumulate'' are inconsistent with certain state laws. As support for this assertion, the commenters gave the example of the state of Illinois' requirements for evacuating mines following an interruption in ventilation, which does not expressly recognize limited use of power and equipment to facilitate evacuation. State mine safety laws, including Illinois', are similar to the final rule provisions for evacuation after a mine fan stoppage. As a general rule, state mine safety regulations that are more stringent than MSHA standards are not considered to be in conflict with federal regulations, and the more stringent safety requirement applies. In this case, if the Illinois regulation would not permit temporary use of power and equipment to facilitate evacuation, then the state law would not be inconsistent with MSHA.

Several commenters objected to the wording, ''where methane is not likely to migrate to or accumulate,'' in paragraphs (c)(2) and (c)(3), as being vague. Other commenters stated that the rule's requirement was simply good practice that would be heeded by prudent mine managers. MSHA agrees that the terms and objectives of the final rule are understood in the mining community, and believes that the determination of whether methane may migrate from adjacent areas and enter travelways and haulageways used by miners during withdrawal should be made on a mine-by-mine basis. Therefore, the final rule retains the exception that power circuits may remain energized and mechanized equipment may be operated only if located in areas where methane is not likely to migrate to or accumulate.

Some commenters stated that history does not support the need for the requirements of paragraphs (c)(2) and (c)(3). Mine fan stoppages unquestionably result in the existence of unventilated areas and may result in highly hazardous methane accumulations. Although there have been a limited number of ignitions/explosions directly attributable to the operation of transportation equipment during a fan stoppage, the true measure of the potential hazard addressed by this standard can be seen in the ignitions and explosions that were the result of the operation of transportation equipment in unventilated areas. Examples of such types of accidents include: The 1972 Itmann No. 3 explosion, in which 5 miners died; the 1976 Scotia Mine explosion, in which 15 miners died; the 1982 Virginia Pocahontas No. 6 Mine explosion in which 1 miner was injured; the 1983 McClure No. 1 Mine explosion, in which 7 miners died; the 1983 Homer City Mine explosion in which a mine examiner was killed; the 1983 Greenwich Collieries No. 1 Mine explosion in which 3 miners were killed and 4 miners were injured and; the 1993 explosion at the Buck Mountain No. 2 Mine in which 3 miners were injured. Given this history of explosions, it would not be prudent to permit electric circuits to remain energized and mechanized equipment to be operated in areas or haulageways where methane is likely to migrate to or accumulate during a fan stoppage.

One commenter stated that the in-mine test necessary to determine the likelihood of methane migration could only be done with the fan stopped. The commenter questioned whether miners would be permitted underground during the tests. To the extent the tests require the main mine fan to be turned off, persons would be allowed underground to evaluate the effect of the fan stoppage or restart.

Paragraphs (d)(1)(i) and (ii) address safety precautions for reentering the mine after ventilation is restored. Key objectives of these standards are the protection of the examiners and the safety of miners returning to work.

As proposed, paragraph (d)(1)(i) would have required that when a fan stoppage lasts for more than 15 minutes a preshift- type examination be conducted covering the requirements of § 75.360(b) through (e) before persons, other than designated examiners, enter any underground area of the mine. Commenters suggested that to provide the level of protection desired, a complete preshift examination, including the certification and recordkeeping requirements of § 75.360(f) through (g), should be required. Commenters pointed to the need for miners reentering evacuated areas to be able to determine if the area had been examined and urged that the final rule require the examiner to certify by initial, date and time the areas examined.

MSHA agrees that clear notice to miners about which areas have been examined is necessary and consistent with the objectives of the rule. The final rule, therefore, adopts the proposal. A record of the hazardous conditions found by examiners is required under § 75.363 of the final rule. This record serves the purpose of providing mine management with the information necessary relative to the existence and correction of hazardous conditions in the mine. The final rule incorporates these requirements by specifying that the scope of the examination be conducted as described in § 75.360(b) through (e).

Under paragraph (d)(1)(i) no one other than designated certified examiners would re-enter any underground area of the mine until the entire examination is completed. Commenters suggested that paragraph (d)(1)(i) be revised to permit partial examinations following fan stoppages and restarts under certain conditions. Under this suggested approach, the examination would focus on the effectiveness of the mine's ventilation system and methane accumulations in travelways, work places or other areas where miners will work following the interruption of ventilation. One commenter further suggested that an exception to this examination be provided for noncoal producing shifts, where persons are to work in the shaft, slope, drift, or on the immediate shaft or slope bottom area. The commenter suggested the examination following a fan stoppage could be limited to this area.

The final rule does not adopt this approach. Limiting the scope of examinations following an interruption in mine ventilation to general

ventilation effectiveness and methane accumulation would not focus on likely areas of concern. For example, no examination for hazards would be required, and no air measurements to determine if the air is moving in its proper direction and at its normal volume would be required. As to the area of the mine required to be examined, only those places where miners will return to work and the route of travel used to reach these places must be examined. Thus, the final rule is sufficiently flexible to meet the commenter's concerns about non- coal producing shifts.

A question arose during public meetings as to the meaning of the term on-coming shift in § 75.360 when applied to § 75.313. For the purposes of § 75.313(d)(1)(i) and (ii) the term ''persons on the on-coming shift'' is interpreted as meaning persons on the shift on which the fan is restarted. If a fan outage extends from one shift into another, a preshift examination as required by § 75.360 must be completed before any person, except certified examiners designated to conduct the examination, enters the mine.

Commenters also suggested that the final rule specify a minimum time for the fan to run before examiners re-enter the mine so that examiners are not unduly exposed to danger. Several commenters observed that this is a general practice in the industry.

MSHA agrees that an important measure of safety is gained by allowing the mine fan to run sufficiently long to begin reventilating the mine before anyone enters. The final rule, therefore, provides designated certified examiners shall enter the underground area of the mine from which miners have been withdrawn only after the fan has operated for at least 15 minutes unless a longer period of time is specified in the approved mine ventilation plan. The 15 minute provision will permit re-ventilation of entries in which examiners will travel to take place and the examiners will then be traveling into the mine in fresh air.

Proposed paragraph (d)(1)(ii) would have required that when a fan stoppage lasts more than 15 minutes underground power circuits are not to be energized and nonpermissible equipment is not to be started until a preshift-type examination is completed. Commenters objected to the proposal for various reasons. One commenter suggested that before power is permitted to be energized a complete ventilation survey should be required. Other commenters focused on the practical considerations involved in conducting examinations and urged that use of nonpermissible equipment for the transportation of examiners be permitted.

As revised, paragraph (d)(1)(i) requires that the main fan when restarted run for at least 15 minutes so that restoration of mine ventilation is underway before anyone enters the mine. Once this is accomplished, electrical circuits in shafts and slopes can be energized safely as these areas are the first places to be reventilated by fresh air. Accordingly, the final rule permits these circuits to be re-energized after the mine fan has run for at least 15 minutes.

The final rule also permits examiners to use nonpermissible equipment for transportation during the examination. The proposal would have prohibited this practice. Some commenters supported the proposed prohibition citing two mining accidents involving nonpermissible equipment in unventilated areas. Other commenters objected to the proposal not to allow the use of nonpermissible equipment to facilitate examinations following the restart of a main mine fan. These commenters stated that travelways and equipment roadways can be examined and tested for the presence of methane, the results of the examination called out, and typical nonpermissible transportation equipment placed into operation to expedite the examination of the mine.

After considering all of the comments, MSHA has revised the proposal and the final rule permits the use of nonpermissible transportation equipment, in intake airways, to facilitate making the examinations after an interruption in mine ventilation. Using nonpermissible equipment in this fashion, in nonventilated areas, has been a demonstrably safe practice for many years in the industry. In addition, the requirement of running the fan for 15 minutes before reentering the mine, together with keeping the transportation equipment in the intake airways where the main ventilating current travels first, provides the desired level of safety.

Under proposed paragraph (d)(2), if ventilation was restored to the mine before miners reached the surface, all miners would have been required to continue traveling to the surface. As proposed, designated certified examiners would have been permitted to remain underground for the purpose of beginning the required examination. The final rule does not adopt the proposal and retains the language of the existing standard.

While supporting the requirement that miners continue to the surface after a fan is restarted, some commenters objected to permitting certified persons to remain underground. These commenters also took the position that once a fan has been off for more than 15 minutes, all efforts to restart the fan should be suspended, unless it is known that it is safe to restart the fan. Other commenters expressed significantly different views on both issues. A number of commenters supported restarting the fan as soon as possible because the longer it is off, the greater the potential hazard. MSHA concurs with this reasoning and the final rule adopts this approach.

On the issue of requiring the evacuation to continue once it has begun until the fan is restarted, even when ventilation is restored, a number of commenters objected that such a requirement would result in unnecessary delays and may result in additional safety risks. One commenter stated that the proposal would not allow for the variables that exist from mine to mine. Several commenters suggested that if the operator has reason to believe that the time frame of the fan stoppage would be less than the travel time or equivalent, the dangers of traveling outby into possible pockets of dangerous gas buildup (or other travel hazards) far outweigh the dangers of staying on the section in intake air back from the face. This would also allow the miners to remain on the section and proceed to the working places after the fan has restarted and the working places have been examined by a certified person.

MSHA disagrees with this position. In some mines, the time to travel from the outside to the working sections can approach 1 hour. Following the approach suggested, miners would remain on the section in an unventilated mine for up to 1 hour. If at the end of this time ventilation is still not restored, it is unclear whether the miners then proceed to the surface, traveling through the same area the commenter suggested might be hazardous some 45 minutes before.

The commenters stated further that, ''Forcing miners to walk out of the mine could take hours and unnecessarily delay the restoration of ventilation and resumption of operations.'' While there may be instances where the time required to withdraw miners is increased, the requirements in paragraphs (c)(2) and (c)(3) have no impact on the restoration of ventilation. In fact, MSHA's position is that ventilation should be restored as soon as possible following a fan stoppage.

Lastly, a number of commenters suggested that when ventilation is restored during evacuation, miners should be permitted to remain where

they are and return to working areas after an examination of inby areas is completed. These commenters stated that no additional measure of safety is gained by requiring miners to continue to the surface if ventilation has been restored and the area in which the miners are located is free of hazards. MSHA agrees and has retained the language of the existing rule. By retaining the existing language, the general practice of miners stopping their evacuation and waiting for examiners to complete their work will continue. Under this approach, miners remain in a safe location while ventilation of the mine is restored. They do not return to any area of the mine until it has been determined to be safe. The final rule does not prevent mine operators from having miners continue to the surface if they so choose. Regardless of whether miners remain where they are or continue to the surface, paragraph (d)(1)(i) of the final rule requires that the fan operate for at least 15 minutes before the examination of the areas from which miners have withdrawn is examined.

Section 75.320 Air Quality Detectors and Measurement Devices

Section 75.320 establishes the standards for the devices relied upon to test for the presence of methane and other dangerous gases that can accumulate in a mine. It generally requires that these devices be approved and maintained in permissible and proper operating condition.

The final rule adds a new paragraph (e). It requires that maintenance of instruments required by paragraphs (a) through (d) of § 75.320 to detect and measure air quality be done by a trained person. The final rule does not include the proposal that before each shift care shall be taken to assure the permissible condition of the air quality detectors and other measurement devices to be used during the shift. MSHA has concluded that this requirement would have been redundant with paragraph (a) and is unnecessary. The final rule permits an operator to send instruments to a repair facility or to the manufacturer for regular servicing. Commenters at the informational meetings and in later discussions on the existing rule stated that maintenance by trained persons should be specified and that requiring only that air quality detectors and other measurement devices be maintained in permissible condition would not be sufficient. They stated that without a requirement for maintenance to be done by a trained person, similar to that which existed in the previous standard, a person with less than the necessary understanding of the instrument and the permissibility requirements might be assigned the task.

Several commenters suggested that the requirements of paragraph (e) are redundant with general requirements found elsewhere in the standards and are unnecessary. Other commenters felt that the current performance standard is adequate, but that the meaning of ''assure'' is unclear. Still other commenters indicated that the assurance of permissibility is properly the responsibility of the user. One commenter noted that the instruments are intrinsically safe and that the manufacturer's instructions are sufficient. MSHA agrees that the general requirement under paragraph (a), together with requiring trained persons, is adequate.

Another commenter suggested that a formal written maintenance program be required. Under this suggestion, the program would be subject to MSHA approval and would include records of all maintenance and calibrations to be made by the end of the shift. This commenter also suggested that existing paragraph (a) be revised to provide for more frequent calibration by inserting the phrase ''* * * or more often if necessary * * *.'' This suggestion has not been adopted since compliance with the proper operating and permissibility provisions of paragraph (a) would result in more frequent calibration, if necessary. MSHA notes that under the previous standard, there was no written maintenance program required nor were records required. MSHA believes that experience under both the previous and existing standards demonstrates that, with the addition of paragraph (e), maintenance and calibration is appropriately addressed in the final rule and safety is not reduced.

Several commenters agreed with the proposal for a ''trained'' person to maintain air quality detectors and measurement devices. These commenters suggested that the trained person be defined as a person designated by the operator who has received training through experience in maintenance of the instrument, has been trained by an experienced person, or one who has received training by or through the instrument manufacturer. MSHA has not adopted this suggestion since the operator should have some flexibility as to the mode of training. The requirement that the person performing the maintenance must be trained is intended to mean that the person be capable of doing the required maintenance, not that they receive a specific course of instruction in what to do.

Commenters suggested that maintenance and calibration requirements should parallel those proposed under § 75.342 for machine-mounted methane monitors. They suggested that, because the detectors and monitors perform similar functions, the requirements should be similar. The final rule does not adopt this suggestion. The methane monitoring instruments under this standard and those governed by § 75.342 are subject to different mining conditions. For example, machine-mounted monitors must be calibrated and maintained underground, on the equipment on which they are installed and on working sections. This calibration must also be scheduled within production timetables. Handheld detectors and measurement devices, however, are removed from the mine and are maintained and calibrated in surface environments. Calibration and maintenance of handheld detectors is usually done during shifts when the instruments are rotated out of service. Thus machine-mounted monitors are calibrated and maintained under more strenuous conditions than handheld detectors.

One commenter suggested that written records of all maintenance and calibration should be required. The commenter further suggested that: Each operator submit a written maintenance program to MSHA for approval and provide a copy to the miner's representative; the written program specify training to be provided; records be completed by the person performing maintenance and be countersigned by the mine foreman within 24 hours; and that records be maintained for one year and be made available to MSHA and the representative of the miners. These additional requirements were not included in the proposal and are not adopted in the final rule. The requirements contained in the final rule adequately address and are appropriately related to the concerns relative to maintenance, calibration, permissibility, and the general condition of air quality detectors and measurement devices.

Section 75.321 Air Quality

The primary function of a mine ventilation system is twofold, to remove hazardous gases such as methane, and to provide miners with an respirable environment in areas where they are required to work or travel. As discussed in the introductory section of this preamble, § 75.321 of the existing standard was stayed by the United States Court of Appeals for the District of Columbia Circuit as it pertains to bleeder entries. The final rule, in

§ 75.321, addresses acceptable levels of oxygen and carbon dioxide in areas of a mine, including areas of a bleeder entry, where persons are required to work or travel.

Paragraph (a)(1) continues a basic air quality requirement that has been in place since 1970 that air in areas where persons work or travel contain at least 19.5 percent oxygen and not more than 0.5 percent carbon dioxide, and the volume and velocity of the air current in these areas be sufficient to dilute, render harmless, and carry away flammable, explosive, noxious, and harmful gases, dusts, smoke, and fumes. Paragraph (a)(2) applies the same requirement for oxygen, 19.5 percent, for the air in areas of bleeder entries and worked-out areas where persons work or travel. The final rule does not require the carbon dioxide level of 0.5 percent to be applied to bleeder entries and worked-out areas. Rather paragraph (a)(2) requires that the carbon dioxide levels in the air in bleeder entries and worked-out areas where persons work or travel not exceed 0.5 percent time-weighted average (TWA) and 3.0 percent short-term exposure limit (STEL).

MSHA interpreted former § 75.301 to require at least 19.5 percent oxygen and no greater than 0.5 percent carbon dioxide in bleeder systems where persons work or travel. It was MSHA's intent that existing § 75.321 would necessitate compliance with these levels where persons would be exposed in bleeder entries and in worked-out areas. However, the application of this provision to bleeders and worked-out areas was stayed by the United States Court of Appeals pending the outcome of litigation addressing the promulgation of the existing rule. MSHA continues to believe that providing necessary air quality is essential to protect miners and examiners whenever they work or travel in bleeder entries and worked-out areas. Therefore, the final rule includes a new provision specifying that the air in bleeder entries and worked-out areas where persons work or travel contain at least 19.5 percent oxygen, and that carbon dioxide not exceed 0.5 percent TWA and 3.0 percent STEL. A TWA is the time-weighted average concentration for a normal 8-hour workday and a 40-hour workweek. A STEL is the maximum time-weighted average concentration to which miners can be exposed for a continuous period of up to 15 minutes. Commenters noted an error in the preamble to the proposal with respect to the time an individual can be exposed to concentrations between the TWA and the STEL. MSHA intends to apply TWA and STEL levels in a manner consistent with the Air Quality rulemaking. The levels for carbon dioxide in the final rule for areas where persons work or travel in bleeder entries and worked-out areas are identical to the levels contained in MSHA's proposed Air Quality standards for coal and metal and nonmetal mines and the 1992 Threshold Limit Values (TLVs) as specified by the American Conference of Governmental Industrial Hygienists (ACGIH).

Some commenters suggested that other changes be included in the final rule. First, they recommended that the permissible minimum oxygen level for bleeders and worked-out areas be lowered from 19.5 percent to 18 percent. Second, they suggested that the requirements that apply to bleeders and worked-out areas be expanded to include airways associated with bleederless mining areas. The rationale given for this second recommendation was that the conditions in these airways are similar to bleeders. In light of the ongoing Air Quality rulemaking, MSHA is not at this time clarifying existing Air Quality standards except those for worked-out areas and bleeder entries.

Commenters for the most part agreed with the change relative to carbon dioxide although one commenter indicated that there was no need for any standard. Bleeder entries and worked-out areas are required to be traveled or evaluated at least weekly. Generally, this is done by a person traveling alone who is often required to be in the bleeder entries or worked-out areas for an extended period. The purpose of this standard is to protect miners, not to regulate air quality where persons are not exposed. Therefore, if examinations are performed remotely or if persons making the examination can otherwise remain in air that meets the requirements of the standard, oxygen and carbon dioxide levels at bleeder connectors and bleeder evaluation points would not have to meet the concentrations required by the final rule.

According to the National Institute for Occupational Safety and Health (NIOSH) of the U.S. Department of Health and Human Services (NIOSH Respirator Decision Logic, May 1987), 19.5 percent oxygen provides an adequate amount of oxygen for most work assignments and incorporates a safety factor. Also according to NIOSH, the safety factor is needed because oxygen-deficient atmospheres offer little warning of danger. In the NIOSH publication, ''A Guide to Safety in Confined Spaces,'' (page 4), a chart is presented that indicates that 19.5 percent oxygen is the minimum level for safe entry into an area, and that at a level of 16 percent, judgement and breathing are impaired. The American National Standards Institute (ANSI), in ANSI Z88.2–1992, ''American National Standard for Respiratory Protection'' recognizes that at 16 percent oxygen there is an impairment in the ability to think and pay attention, and a reduction in coordination. ANSI recognizes that at 19 percent oxygen there are some adverse physiological effects.

The need for regulating the oxygen level where persons work or travel in bleeder entries is illustrated by two mining accidents. One of these accidents resulted in the death of a mine examiner and the second resulted in the near death of two individuals, one of whom was a mine examiner. Mine examiners are, through training and experience, the individuals best able to identify the hazards associated with irrespirable atmospheres. The first accident occurred at the Arclar Mine in Equality, Illinois in 1989. Prior to implementation of the existing standard, a mine examiner entered a worked-out area that was posted with a danger sign and was asphyxiated. Under the existing regulation, ventilation or sealing of this area, rather than posting, would be required. Because the area was not sealed, the existing regulation would require the area to be examined during the weekly examination. The final rule would require that the route of travel for the examiner contain at least 19.5 percent oxygen. Had the final rule been in place when the examiner entered the worked-out area, the accident may have been avoided.

The second accident, although not in a bleeder entry or worked-out area, is illustrative of what can happen when individuals, including mine examiners, are subjected to oxygen deficient air. In 1983 at the Bird No. 3 Mine in Riverside, Pennsylvania, an assistant mine foreman, a certified person, entered the mine for the purpose of conducting an examination. After traveling approximately 1100 feet, the examiner became dizzy, noticed that his flame safety lamp had extinguished and withdrew approximately 200 feet where he sat down and apparently became unconscious. A second individual upon entering the area in search of the examiner also became dizzy but was able to withdraw to a location that was not oxygen deficient. When the mine examiner regained consciousness, his cap lamp battery had discharged and he traveled in total darkness until he encountered a mine rescue team. Air samples collected in the area where the mine examiner first became dizzy

indicated an oxygen level of about 16.8 percent, while other samples collected nearby indicated oxygen concentrations of nearly 20 percent.

Because mine examiners are required to work or travel in areas where oxygen-deficient air could occur without warning, and they normally travel and work alone, there must be a requirement that provides them the protection necessary for the performance of their duties under these conditions. It is important that the level for oxygen be established above that identified as resulting in impaired judgement because it is essential that individuals traveling in these areas remain highly alert. The hazards that can exist in bleeder entries and worked-out areas include elevated methane levels, poor footing, loose and unstable roof, and water accumulations. For this reason, the final rule adopts a minimum level of oxygen of 19.5 percent as recommended by NIOSH.

MSHA is also concerned with the effects of other gases often found in bleeder entries. Section 75.322 of the existing regulation limits the concentration of noxious or poisonous gases to the current (1971) TLV's as adopted and applied by the ACGIH. Section 75.322 specifically excludes carbon dioxide since it is covered by § 75.321. However, so the mining public will clearly understand the application of the regulation, the final rule establishes a separate standard for carbon dioxide levels for areas where persons work or travel in bleeder entries and worked-out areas. The levels set by the final rule, 0.5 percent TWA and 3.0 percent STEL, when considered in conjunction with the requirements of § 75.322 and the requirement for oxygen, will provide persons working or traveling in these areas with a safe and healthful working environment. MSHA recognizes that the effects of carbon dioxide are both chronic and acute and, therefore, sets both a TWA and a STEL. NIOSH, in recommending a standard for carbon dioxide, also recognized this and recommended a similar approach. The NIOSH recommendation, made in a Criteria Document published in 1976, proposed a TWA concentration of 1.0 percent and a ceiling value of 3.0 percent not to exceed 10 minutes. In making this recommendation, NIOSH recognized that there are additive stress effects of increased carbon dioxide concentrations and exercise. As support for this, the NIOSH document cites research that showed that healthy, trained subjects exposed to 2.8 to 5.2 percent carbon dioxide at maximum exercise levels experienced respiratory difficulty, impaired vision, severe headache, and mental confusion; three subjects collapsed.

During rulemaking on the proposed air quality standard, NIOSH recommended a 0.5 percent TWA and a 3.0 percent STEL. NIOSH made a similar recommendation to the Occupational Safety and Health Administration during that Agency's permissible exposure limit rulemaking. Given the work environment in bleeder entries and worked-out areas, as described earlier, MSHA believes that the regulatory approach to bleeders and worked-out areas provided by the final rule is necessary and appropriate. In addition to examiners, other miners may be required to work in the bleeder entries and worked-out areas, performing duties such as installing roof support, pumping water, recovering materials or adjusting ventilation. The levels established in the final rule would provide these miners with the necessary protection.

Section 75.323 Actions for Excessive Methane

Section 75.323 establishes the actions that must be taken when methane reaches certain levels. Methane is the most dangerous gas encountered by miners working underground. When the level of methane reaches 5.0 percent it is explosive. Section 75.323 generally establishes action levels below this lower explosive limit to permit appropriate actions to be taken by mine operators in order to prevent an explosion.

The final rule adopts the proposal for § 75.323. In doing so, it revises paragraphs (b)(1)(ii), (c)(1), and (d)(2)(i) of the existing standard. The rule clarifies that corrective actions at specified methane levels must be taken ''at once'' and provides that actions for excessive methane include areas where mechanized mining equipment is being installed or removed. MSHA believes that final rule § 75.323 increases the protection afforded by the existing standard.

Initially, the need for clarification was raised during informational meetings and subsequent discussions after publication of the existing rule. As discussed below, the final rule retains the language of the proposal which is identical to the wording of the previous standard.

Some commenters indicated that delays in remedial actions to reduce methane were being experienced at some mines. These commenters attributed delays to the deletion of the phrase ''at once'' in the existing standard. These commenters also suggested that the phrase ''at once'' conveys the proper sense of urgency to correct the condition. Other commenters stated that the addition of the phrase ''at once'' does nothing to improve health or safety. MSHA has included the phrase in the final rule for clarity.

Methane poses a significant hazard to miners when it is permitted to accumulate without corrective action being taken quickly. MSHA has always intended that corrective changes be made at once. The final rule revises paragraphs (b)(1)(ii), (c)(1) and (d)(2)(i) to require that these changes be made ''at once,'' the phrase used in former §§ 75.308 and 75.309.

Some commenters stated that the proposal, if literally enforced, would necessitate changes to be made before the cause or source of the increase in methane can be investigated. Other commenters stated that approvals must be obtained for many ventilation changes and that some changes require extended periods of time to complete. Operators may take those actions necessary to abate imminent dangers or hazardous conditions, or to safeguard persons and equipment. A part of this action would be a determination of the cause of the problem. MSHA knows of no case where an operator has been prohibited from a necessary correction for a methane problem pending a plan approval. However, in cases where intentional changes are made which could materially affect the safety and health of miners, approval is required before resumption of normal work if the changes affect the information approved in the mine ventilation plan. MSHA recognizes that some ventilation changes take time to accomplish and interprets the phrase ''at once'' as meaning that the work of making the necessary change to reduce methane levels begins immediately.

One commenter questioned how the phrase ''at once'' would apply to a methane feeder which is encountered despite an appropriate and well thought out ventilation change. MSHA recognizes that methane feeders may be encountered unexpectedly. As long as a mine operators takes action as required by the standard, they will be in compliance.

One commenter suggested that some MSHA personnel were improperly interpreting methane excursions above 1.0 percent to be violations of the standard. The commenter seemed to suggest the regulations should provide that the actions specified in § 75.323 for excessive methane do not apply to concentrations detected on machine-mounted methane monitors. Other commenters indicated that the standard requires unnecessary ventilation

changes in response to instantaneous increases caused by excessive methane liberation. MSHA recognizes that instantaneous methane monitor readings for machine mounted monitors may occasionally reach or exceed 1.0 percent. Usually, these are short-lived and the monitor reading quickly falls below 1.0 percent, even before the machine operator can react. However, consistent monitor readings of 1.0 percent or more indicate a problem and should cause appropriate changes and adjustments. Repeated short duration increases above 1.0 per cent should also be cause for concern and may necessitate changes or adjustments to ventilation.

With respect to paragraphs (b)(1), (b)(2), and (c)(1) some commenters stated that the mere presence of methane does not constitute a violation of a mandatory health and safety standard. MSHA agrees. In this context, one commenter suggested replacing the word ''present'' with ''detected.'' The commenter continued that an operator cannot possibly correct a methane problem until it has been detected, that the rule should reflect realistic expectations, and that the current term ''present'' is meaningless. MSHA agrees that a methane problem cannot be corrected unless it has been detected and that the mere presence of methane does not constitute a violation. Only the failure to properly respond once being made aware of the presence of methane in excess of allowable levels is a violation. The standard requires that an operator properly conduct an examination; and if methane over 1.0 percent or 1.5 percent is found, as applicable, corrective action must be taken at once.

When 1.0 percent or more methane is present in a working place, an intake air course, or an area where mechanized mining equipment is being installed or removed, paragraph (b)(1)(i) of the final rule requires all electrical, diesel, and battery- powered equipment in the affected working place, intake air course, or other area, except for intrinsically safe AMS, to be deenergized or shut off. Deenergizing or shutting off of this equipment protects miners by preventing this equipment from providing ignition sources.

One commenter suggested that non-intrinsically safe AMS equipment should be permitted to run under battery power when 1.0 percent or more methane is encountered. The commenter stated that the benefit derived through the system's operation outweighs the hazard of the non-intrinsically safe system. The commenter continued that since the batteries will deplete quickly, little hazard would result, or in the alternative, each battery outstation could be monitored for methane and automatically trip at some set methane level. The final rule does not include this suggestion. Where excessive methane concentrations necessitate that power be deenergized, information from continued operation of the non-intrinsically safe system would not outweigh the potential ignition hazard. To permit operation of a non-intrinsically safe system in areas known to contain excessive levels of methane would be a departure from accepted, effective, and long standing safety practice.

Several commenters objected to the requirement in paragraph (b)(1)(iii) that prohibits any work in the affected area until the methane is reduced to less than 1.0 percent. Commenters questioned whether the standard would prohibit an operator from taking steps to reduce the methane. The language must be given a reasonable interpretation and should be considered in context of the preceding requirement in paragraph (ii) that ''changes or adjustments shall be made at once * * *''

These requirements are virtually identical to those found in the previous standard which was in effect for over 20 years. MSHA is unaware of any instance where an operator was prohibited from correcting methane problems by such an application of the standard.

Some commenters suggested adding a phrase to paragraph (b)(1)(iii) to read, ''No work other than removal of the accumulation shall be permitted * * *'' Similarly, MSHA believes that the suggested change is unnecessary and has not adopted it. MSHA experience indicates that the rule is well understood and has been properly applied.

Other commenters thought that the standard, as proposed, would cause hasty, ill-advised changes to be made and would prohibit an investigation into the cause or source of the methane problem which could result in phased-in corrections. MSHA agrees that operators should seek long term solutions and should fully investigate the cause or source of methane accumulations. Investigation and long term corrections are not prohibited by the rule. However, the final rule does require that certain actions be undertaken at once to correct the short term or acute safety hazards resulting from accumulations of methane.

If 1.5 percent or more of methane is present in a working place, an intake air course, or an area where mechanized mining equipment is being installed or removed, paragraph (b)(2) of the final rule requires persons to be withdrawn from the affected area. The presence of methane in these areas can pose a significant risk to miners and therefore their withdrawal from the affected area is essential to their safety. Paragraph (b)(2) also requires that all electric power to equipment in affected areas be disconnected at the power source. This prevents accidental energization of equipment and removes power from cables and circuits which may also be ignition sources. No other work is permitted in the affected area until the concentration of methane is less than 1.0 percent. A conforming change is also made to paragraph (b)(2) by adding ''mechanized'' before mining equipment for consistency with other provisions of the rule.

Comments were received which objected to the (b)(2)(ii) requirement that except for intrinsically safe AMS, electrically powered equipment in the affected area shall be disconnected at the power source. Some commenters suggested that this equipment should be simply ''deenergized.'' These commenters stated that there was no need to disconnect the power source, that this could require belt drives, pumps, etc. to be physically disconnected where permanent connections have been made, which could result in a major unnecessary operation. MSHA has not adopted this suggested revision. MSHA issues numerous citations and orders for damaged power cables, trailing cables, and splices where the conductors are badly damaged or exposed. Each of these citations and orders represents the presence of a potential ignition source. Power cables would remain energized under these conditions as would be the case if the commenters' suggestion were adopted.

There are several aspects of § 75.323 which were not proposed for revision, but for which comments were received. Comments were received relative to the 1.0 percent action level in intake air courses. Commenters contended that Congress established an immutable methane limitation of 0.25 percent in intakes. Commenters stated that because Congress had expressly limited intakes passing openings to abandoned areas to 0.25 percent methane, that implicitly, all intakes were limited to 0.25 percent methane. However, the commenter then suggested adopting an intake action level for methane of 0.5 percent. MSHA notes that the methane levels were not proposed for revision and are not being revised under the final rule. The commenters, however, should refer to a discussion of this issue included in the

preamble to the existing rule dated May 15, 1992.

If 1.5 percent or more methane is present in return air, paragraph (d)(2)(i) would require changes or adjustments be made ''at once'' to the ventilation system to reduce the concentration of methane. Because of the hazards presented by accumulations of methane, MSHA believes that changes or adjustments should be made immediately and be made independent of the mine ventilation plan in the interest of safety. MSHA recognizes that some changes take time to complete. If operators begin ''at once'' to make the necessary changes and adjustments, they will be in compliance with the standard.

MSHA received comments relative to § 75.323 which, although were outside the scope of the rulemaking, demonstrate an incorrect understanding of the existing rule. The limitations on methane content and the associated actions required when excessive methane is encountered are important components of a safety program to protect underground miners. Therefore, several of these comments will be addressed so that the mining community will better understand these standards.

First, one commenter objected to the existing requirements in § 75.323(d). The commenter incorrectly stated that paragraph (d) permits normal operations with 1.5 percent methane in working places. Methane limits in working places and intake air courses is limited by § 75.323(b). Paragraph (b) specifies actions if 1.0 percent methane is present, and withdrawal if 1.5 percent is present. Similarly, § 75.323(c) limits methane between the last working place on a working section and where that split of air meets another split of air to 1.0 percent and requires withdrawal at 1.5 percent. Paragraph (d) modifies the requirement for that portion of the return split outby the section loading point and has no effect on methane either in working places or between the last working place and the point in the return opposite the loading point.

One commenter indicated a preference for the language used in a previous MSHA regulation, § 75.308–1. The previous standard restricted the changes or adjustments to increasing the quantity or improving the distribution of air in the affected working place to an extent sufficient to reduce and maintain the methane to less than 1.0 percent. The existing rule establishes a performance standard that allows for several methods of compliance. One acceptable method of compliance is to limit the rate of production of coal to permit the existing ventilation system to maintain the level of methane below 1.0 percent. In all cases, however, increasing the quantity or distribution of air continues to be an accepted means of reducing methane levels. No safety benefit would be derived from disallowing reduced coal extraction rates as a means of maintaining methane levels under 1.0 percent.

The final rule retains the language of proposed §§ 75.323(b)(1)(i), 75.323(b)(1)(iii), and 75.323 (b)(2)(i) and (b)(2)(ii) which is identical to the wording of the existing standards. An in-depth discussion of the reproposal of provisions concerning the installation and removal of mechanized mining equipment is presented in the General Discussion section of this preamble.

Section 75.324 Intentional Changes in the Ventilation System

This section addresses the precautions that must be taken when a significant change is made to the ventilation system. MSHA did not propose any change to existing § 75.324 and is not making any revisions in the final rule.

Questions had been raised concerning the language, ''materially affect the safety or health of persons in the mine'' that appears in the existing standard. The phrase is important in that it identifies those ventilation changes that require approval of the MSHA district manager under § 75.370(c). MSHA regards it as impractical to follow a ''cookbook'' approach to identifying what will or will not require approval. Each particular circumstance is to be reviewed by the operator on its own merits. To illustrate the Agency's expectations, the following is a list of some examples of what MSHA considers intentional changes that would materially affect the safety or health of miners. These examples are not meant to include all possibilities, but are meant to provide some general guidance: adding a new shaft; bringing a new fan on line; changing the direction of air in an air course; changing the direction of air in a bleeder system; shutting down one fan in a multiple fan system; starting a new operating section with ventilating quantities redistributed from other sections of the mine; changing entries from intakes to returns and vice versa; and any change that affects the information required by § 75.371, Mine ventilation plan; contents.

Comments were specifically solicited on issues raised in the preamble discussion to the proposal. In response, written comments were received from one commenter. These comments were reinforced by several speakers at the public hearings. Other commenters indirectly referred to § 75.324 and stated that the phrase, ''materially affect the safety or health of persons in the mine'' is accepted and understood by the mining community.

One commenter suggested that the person designated by the operator to supervise ventilation changes should be a certified person that is knowledgeable of the mine's ventilation system. The results of changes to a complex ventilation system are not always easy to predict, and for that reason caution must be used when making significant changes to one air split or several air splits. The balance of splits can be affected and may result in air reversals, dead air spaces, or insufficient air flow in critical areas. For this reason, such changes must be evaluated by a certified person examining the affected areas to determine that the areas are safe before production is resumed. Therefore, the Agency believes that it is to be an unnecessary burden to also have ventilation changes supervised by a certified person. Thus, the suggestion of the commenter has not been adopted in the final rule.

This commenter also suggested that the provisions of § 75.324 should apply to all intentional changes which alter the air current in any section or area of the mine by 10 percent or more, or by 9,000 cfm or more, whichever is less and that such change be considered to affect the entire mine. The commenter recommended the miners' representative be afforded the right to accompany the certified person to evaluate the effects of the ventilation change and that a preshift examination of the mine be conducted to assure that the mine is safe before electric power is restored.

The commenter also suggested that a record be maintained of all ventilation changes to include the names of all persons involved with the change, the date and time of the change, and results and locations of air quality and quantity measurements taken both before and after the change. The commenter stated that the record should be made in an approved book within 24 hours of the change and that the record should be signed and countersigned. Finally, the commenter recommended that the mine ventilation map should be updated immediately after the ventilation change is made and that within 24 hours of the change, the updated map should be made available to the miners' representative and a copy sent to the district manager. Section 75.370(c) requires that any change to the ventilation system that alters the main

air current or any split of the main air current in a manner that could materially affect the safety or health of the miners, or any change to the information required in § 75.371 shall be provided to and approved by the district manager before implementation. The final rule requires that this information be provided to the miners' representative at least 5 days before submittal to the district manager (See § 75.370 for full discussion). MSHA believes that this provision provides necessary protection for miners.

One commenter stated that the standard is reactive and that MSHA routinely cites mine operators after a methane explosion or ignition. MSHA believes that the standard is designed to assure that operators are proactive and develop plans that prevent hazardous conditions. The Agency anticipates that with the clarification provided through this rulemaking, operators will obtain MSHA approval prior to making intentional ventilation changes that materially affect the safety and health of miners, thereby preventing potentially hazardous conditions. When questions arise as to whether an anticipated change requires prior approval, MSHA is available to provide guidance as to whether approval is necessary.

Section 75.325 Air Quantity

The quantity of air in cubic feet per minute (cfm) is an important measure of underground coal mine ventilation. It is essential for miners' health and safety that each working face be ventilated by a sufficient quantity of air to dilute, render harmless, and carry away flammable and harmful dusts and gases produced during mining. An insufficient quantity of air at a working face could permit methane to accumulate and lead to an explosion. Section 75.325 generally establishes the quantities of air that must be provided and the locations underground where these quantities must be provided.

Section 75.325(d) requires that areas where mechanized mining equipment is being installed or removed be ventilated and that the minimum quantity of air and the ventilation controls necessary to provide these quantities be specified in the approved mine ventilation plan. The final rule adds the word ''minimum'' to the phrase, ''quantity of air'' that appears in the existing standard and the proposal. The existing standard was reproposed without change. An in-depth discussion of the reproposal of provisions concerning the installation and removal of mechanized mining equipment is presented in the General Discussion section of this preamble.

Only a few comments were received that were specific to paragraph (d). One commenter discussing § 75.371(r) suggested that the quantity of air required by § 75.325(d) to be specified in the plan should represent the ''minimum'' quantity to be provided and that the location specified should be identified as typical so as to give the mine the flexibility to adapt to conditions. This comment is consistent with MSHA's intent for the proposal and helps to clarify it. Therefore, the word ''minimum'' has been inserted into the final rule in both § 75.371(r) and paragraph (d) of § 75.325. Obviously, mine operators can have air quantities which exceed the minimum specified in the mine ventilation plan. MSHA agrees conceptually with a comment that the ventilation scheme shown in the plan should be representative of the method of ventilation to be used. However, MSHA does not adopt this comment because the plan must also be specific enough so that the operator, the miners, the representative of miners, and MSHA are assured that the areas are being adequately ventilated.

Other commenters suggested that the total quantity of air to be delivered to a longwall needs to be specified in the mine ventilation plan. In support of the suggestion the commenter stated that the inclusion of the word ''total'' recognizes that some mines may use belt air at the set up or tear down phase while some intake air may be diverted to ventilate bleeders, battery chargers or compressors and, therefore, the total quantity of air being delivered to the longwall face should be the figure with which MSHA is concerned. The commenter stated further that the recommendation recognizes that conditions vary greatly from mine to mine, coal seam to coal seam, even from one longwall panel to the next panel of the same mine. The commenter added that while a specified amount of air can be delivered to a recovery face, and pressure can be placed on the gob, it is impossible to guarantee a specified volume or velocity of air at the recovery point.

MSHA agrees that the total air quantity provided to a recovery face is of importance; however, the distribution of this air is also important. The volume of air being delivered to the longwall face during equipment removal is important because of the types of activities that occur (e.g. cutting and welding and the operation in some cases of considerable numbers of diesel powered vehicles) and the fact that it is along the face that the majority of miners work and where an ignition hazard exists. It is important to know exactly how areas where mechanized equipment is being installed or removed will be ventilated. Therefore, this suggestion has not been included and the rule.

Commenters were concerned about the ventilation of a longwall face prior to the first gob fall. This type of concern should be handled through the mine ventilation plan. Paragraph (d) only deals with areas were mechanized mining equipment is being installed or removed and not where mining is in progress.

Section 75.330 Face Ventilation Control Devices

The final rule adds a new paragraph (c) adopting the proposal language. The new paragraph (c) requires that when line brattice or any other face ventilation control device is damaged to an extent that ventilation of the working face is inadequate, production activities in the working place are required to cease until necessary repairs are made and adequate ventilation is restored. MSHA notes that before issuing a citation for a violation of this provision, an inspector would normally be expected to measure the air quantity to determine whether adequate ventilation is being maintained.

Some commenters considered the proposed regulation redundant since operators must already maintain minimum air quantities at the face, thereby making repairs necessary to maintain the required quantity. Face ventilation controls are a critical feature of reliable ventilation. As such, maintaining these controls in good condition and making repairs necessary to restore ventilation is sound safety practice. To do less invites increased risk of a methane ignition and elevated respirable dust. Also on a practical level most miners on a working section do not have a means of measuring air quantities. However, miners can determine when ventilation controls are damaged appreciably and are likely to adversely affect the air quantity.

One commenter indicated that entire working sections might be shut down to repair a ventilation control at any one face with no corresponding safety benefit. The final rule provides that ''production activities in the working place shall cease'' until adequate ventilation is restored. Unless elevated methane levels or some other problem existed, the entire section would not be shut down for repair of a ventilation control.

Some commenters asserted that controls may be slightly damaged while still maintaining quantities in excess of

the requirements at the face. Similarly, commenters worried that numerous citations would be issued based solely on the appearance of the controls, even though the minimum required face air quantities are exceeded. These commenters stated that the only reliable indicator is an air measurement.

MSHA agrees that the only precise indicator of air quantity is a measurement. Accordingly, MSHA anticipates that noncompliance decisions will be based on air measurements which show ''ventilation of the working place is inadequate.'' However, ventilation controls which are in poor condition are likely to cue an inspector to conduct an air measurement.

Other commenters generally expressed the view that the requirements of § 75.330, even considering the proposed revision, are inadequate to fully address the issue of face ventilation. According to these commenters, additional requirements are needed, including: proper installation and maintenance criteria for face ventilation control devices, requirements for providing devices continuously from the last open crosscut to the working face, immediate repair of these devices if damaged by a fall or otherwise, providing sufficient space between the line curtain and the rib and maintaining the area free of obstructions, and minimizing leakage while providing installations which permit traffic to pass without adversely affecting ventilation. Further, the commenters asserted that only cumulatively can the desired result be obtained through these requirements and that additional requirements would empower individual miners to take corrective actions when needed.

Each of these suggestions is a desirable ventilation practice which MSHA supports. However, the final rule is not intended to set detailed standards for the installation of ventilation control devices. Instead, the rule addresses minimum requirements for face air quantities and requires the face ventilation system used to deliver these quantities to be maintained.

Some commenters indicated a concern about so-called ''deep-cut'' mining wherein continuous miners, by remote control, develop cuts from 25 to 60 feet inby permanent roof support. Commenters questioned the adequacy of face ventilation where ventilation controls may be 30 to 50 feet from the face. Specifically, questions were raised about: whether adequate ventilation actually reaches the face in ''deep cuts'' to dilute methane; whether more frequent air measurements are needed; whether methane checks are representative of face concentrations; maximum feasible cut depth and ventilation device distance; respirable dust in ''deep cuts;'' proper maintenance of ventilation control devices; how ventilation is maintained after the continuous miner is withdrawn from the cut; roof bolter ventilation; and differences between scrubber systems and sprayfan systems. Another commenter noted that historically most roof fall fatalities have occurred within 25 feet of the face. This commenter asserted that the deep-cut mining system helps to resolve this problem and reduce exposure. The commenter continues that to prohibit any variation from the 10 foot line curtain distance requirement would adversely affect safety of the miners working in the area.

MSHA agrees that each of these issues is important. The appropriate vehicle to address these specific concerns is the mine ventilation plan required by existing § 75.370. The mine ventilation plan provides the necessary latitude to address the diversity of mining conditions found throughout the country. Details of each system must be shown in the plan and must be specific to the conditions at each mine where such a system is employed. Also, MSHA's review and approval of mine plans includes an onsite investigation to evaluate the system and to assess the adequacy of the specified plan parameters. In addition, inspectors routinely evaluate the suitability of the mine ventilation plan during regular mine inspections.

The commenter's concerns about methane checks in ''deep cuts'' is addressed by the final rule § 75.362(d)(2) which requires that methane tests be made ''at the face.'' This new requirement will assure that measurements are taken at the location where the hazard is most likely to occur. Testimony received at the public rulemaking hearings indicated that technology exists in the form of extendable probes that can be used to take these measurements, without putting miners at additional risk from fall of ground.

Section 75.332 Working Sections and Working Places

Working sections and working places are the areas of a coal mine with the greatest amount of activity and the largest concentration of workers. They are the location of the greatest number of potential ignition sources. They therefore harbor the greatest risk of accidents such as methane ignitions and explosions and equipment fires. Section 75.332 addresses the ways these areas are ventilated to reduce the likelihood of an accident on one section impacting another section, with deadly consequences. Generally, § 75.332 provides that each of these areas must be ventilated with a separate split of fresh air that has not been used to ventilate another working area or an area where mining has ceased if this area cannot be examined. When ventilated in this manner, the products from a fire on one section will not contaminate another section and methane in worked-out areas will not be carried to working sections by the ventilating air stream.

The final rule provides that each working section and each area where mechanized mining equipment is being installed or removed, shall be ventilated by a separate split of intake air directed by overcasts, undercasts or other permanent ventilation controls. The final rule adopts the language of proposed § 75.332(a)(1), which is identical to existing § 75.332(a)(1). An in-depth discussion of the reproposal of provisions concerning the installation and removal of mechanized mining equipment is presented in the General Discussion section of this preamble.

Several commenters responded to § 75.332(a)(1). Some commenters suggested that the standard be revised to permit the installation of mechanized mining equipment in either the return or intake air courses of working sections provided the air had not been used to ventilate any worked-out areas, areas where pillars have been recovered, or bleeder systems. The commenters maintained that prohibiting the installation of longwall equipment on the same split of air as a developing unit delays the installation of a mining system. The commenters further observed that this mining equipment consists mainly of steel conveyor sections and roof supports that contain a 95 percent water-based hydraulic fluid which does not burn. Therefore, according to these commenters, longwall mining equipment can safely be installed on the intake side of an active mining unit and, with monitoring, in the return air course of an active mining unit.

The safety benefits of using separate splits of air to provide ventilation are well established. A primary benefit of such a provision is to protect workers down-wind from being put at risk by events up-wind from their location. Among the most serious of these risks is miners being overcome by the products of combustion or an explosion.

In Miner's Circular 50, ''Explosions and Fires in Bituminous-Coal Mines'' published by the Bureau of Mines in

1954, the authors state that when air travels a long path through a mine, it gradually becomes depleted of oxygen and may become so contaminated with other gases that it no longer is healthful, or it may accumulate enough explosive gas to present an explosion hazard. The authors go on to state that when the air is divided into several splits, each traveling a short path, better air can be furnished to each group of persons in the mine. Further, if a local explosion or fire should occur, the poisonous gases evolved may be confined to one section and the force of the explosion and the gases may kill all the persons in that particular section but may not affect other sections of the mine. According to the authors, when a mine is ventilated by a continuous current of air, the miners on the return side of an explosion or fire probably will be killed or overcome by the poisonous gases and that judicious splitting of the air is a safeguard against this eventuality.

Similarly, Stefanko states in the 1973 edition of the Society of Mining Engineers (SME) Engineering Handbook that splitting the air is recognized as being necessary for safety and presents only minimal power cost.

The commenters implied that because longwall mining equipment is largely noncombustible, this danger is minimized for workers down-wind on an active mining section. This reasoning overlooks the fact, however, that the installation of a longwall is labor-intensive, involving cutting and welding in the presence of methane and coal, as well as machinery operating under load. These conditions add contaminants to the ventilating current, and increase the possibility of a fire or explosion. Likewise, a longwall being installed on the return side of an active mining section would expose the miners doing the installation to the dust and gases, and the results of a fire or explosion, from the section. Even with monitoring, miners would be put at risk as their opportunities for escape would be limited. For these reasons, the final rule does not adopt the commenters'' suggestion.

One commenter also suggested that ''approved ventilation controls'' be required instead of specifying that overcasts, undercasts or other permanent ventilation controls be used to direct intake air. The commenter explained that this would allow operators the flexibility of submitting plans that allow the use of temporary controls in some instances.

Temporary controls to split air are not as reliable as permanent controls. The first explosion at the Scotia Mine in 1976 which killed 15 miners, was due in part to the improper use of a temporary ventilation control where a permanent control (i.e., an overcast) should have been used. More recently, the explosion that occurred during the set up of a longwall at the Golden Eagle Mine in 1991 which injured 11 miners involved the removal of two permanent ventilation controls and the replacement of these controls with temporary controls. As these and other accidents illustrate, the ventilation controls that deliver air to working areas are vitally important to miners'' safety. Therefore, the final rule requires that these controls be permanent in nature and not temporary.

Another commenter indicated that the use of temporary controls would lower worker exposure to hazards by not requiring repeated handling of permanent control materials which can be heavy. Proper handling practices and modern materials can reduce the risk of injuries associated with handling construction materials. MSHA considers these risks lower than the dangers of using temporary controls in lieu of permanent controls.

Section 75.333 Ventilation Controls

The primary means for directing air from the outside, through the mine openings, to the working areas and back to the surface is through the use of ventilation controls: either permanent controls, such as stoppings (walls), overcasts or undercasts (air bridges), and doors, or temporary controls, such as line brattice (curtains). Permanent ventilation controls are designed for long term use while temporary controls are intended for use on a short term basis. In general, § 75.333 specifies where each type of control can be used and how each permanent control is to be constructed. It is essential that ventilation controls be correctly constructed, maintained, and properly located to provide ventilation to working sections and other areas where it is needed to dilute methane, respirable coal mine dust and other contaminants, and provide miners with a safe and healthful work environment.

The final rule revises paragraphs (a), (b)(1), (b)(3), (b)(4) and (e)(1) of existing § 75.333, and adds a new paragraph (h). Revisions to paragraphs (a) and (e)(1) address the durability of stoppings, while the revisions to (b)(1), (b)(3) and (b)(4) address ventilation controls required when continuous haulage systems are used. New paragraph (h) requires all permanent ventilation controls, including seals, to be maintained to serve the purpose for which they were built.

The use of continuous haulage systems, particularly in low seam coal mines, is becoming more common. The final rule specifically addresses continuous haulage systems in paragraphs (b)(1), (b)(3) and (b)(4) of the rule and clarifies where temporary controls are an acceptable means of ventilation control when these systems are used. Continuous haulage systems utilize mobile bridge conveyors or similar mechanisms to transport coal directly from a continuous mining machine to a low profile belt. As the continuous mining machine moves from place to place, the continuous haulage system slides back and forth along a low profile conveyor belt using a ''dolly'' or other travel mechanism. The low profile conveyor belt then transports the coal to the section conveyor belt.

The existing rule permits the use of temporary ventilation controls in lieu of permanent ventilation controls to separate continuous face haulage systems from return, intake, and primary escapeway entries in rooms developed 600 feet or less from the centerline of the entry from which the rooms were developed. This practice is consistent with longstanding MSHA policy, which recognizes that these rooms are used for a short duration and the minimum air quantity must be maintained regardless of the controls used.

Existing paragraph (b)(1) allows temporary controls to separate intake and return air courses in rooms driven 600 feet or less from the centerline of the entry from which the room was developed. The final rule adds to existing paragraph (b)(1) the proposed language clarifying that the use of temporary controls in these rooms is also acceptable when continuous haulage systems are used. This change responds to commenters who point out that the rooms in which the continuous haulage systems are installed are continuously attended by the operators of the system and an immediate response to any safety related problem with the system or the ventilation controls would be expected. Commenters also noted that two or three rooms are often concurrently developed using a continuous haulage system and the life of the actively developing rooms is often less than three days. As a result of this short life, mining in these rooms is often completed before construction of permanent controls is finished. Also, access to the continuous haulage system is required through crosscuts for maintenance and operation of the system.

Under paragraphs (b)(3) and (b)(4) the proposal would have required belt and

intake separation to the outby travel point of the dolly and belt and primary escapeway separation to the inby most travel point. Commenters indicated confusion because of the distinction between intake and primary escapeway separation and believed that conflicts would exist. Commenters also suggested that the language proposed to address the use of temporary ventilation controls for continuous haulage systems was confusing and contradictory. The final rule revises the requirements of proposed paragraphs (b)(3) and (b)(4) to respond to these comments.

Paragraph (b)(3) of the final rule retains the requirement that permanent controls be provided to separate belt conveyor haulageways from intake air courses when the air in the intake air course is used to provide air to active working places. The final rule also retains the proposed provision that when continuous haulage systems are used in rooms less than 600 feet from the centerline of the entry from which the rooms were developed, temporary stoppings or other temporary ventilation controls may be built and maintained to provide the required separation.

Commenters stated that new technology may result in continuous haulage systems with the outby point of travel of the dolly extending considerably beyond the 600 feet distance. The commenters noted that such an extended length of temporary controls could result in unanticipated adverse consequences for the ventilation system, and suggested that a maximum distance of 300 feet outby the inby point of travel of the dolly be established for the use of temporary ventilation controls. MSHA agrees that extensive use of temporary ventilation controls can create problems, including excessive leakage and the possible short circuiting of air. The final rule, therefore, limits the distance that temporary controls may be used to separate continuous haulage systems from intake air courses, including the primary escapeway. The final rule permits temporary controls to be used from the point of deepest penetration of the conveyor belt entry to the most outby point of travel of the dolly or 600 feet, whichever distance is the less. As a result, 600 feet is the maximum linear distance of entry in which temporary controls may be used for separation of air courses. The 600 feet would be measured as a straight-line distance from the point of deepest penetration in the conveyor belt haulage entry. This approach comports with the 600 foot limit for the use of temporary stoppings in rooms and allows a reasonable use of temporary ventilation controls with continuous haulage systems, while preserving the integrity of the ventilation system. At present, MSHA would expect that the most outby point of travel of the dolly would govern since MSHA is not aware of any continuous haulage systems which travel more than 600 feet outby the point of deepest penetration.

Paragraph (b)(4) of the final rule continues to require permanent stoppings or other permanent ventilation control devices to separate the primary escapeway from the belt and trolley haulage entries, as required by § 75.380(g). Commenters suggested that for the purposes of § 75.380(g), the definition of loading point in proposed paragraph (b)(4) be revised to be the outby point of travel of the dolly as opposed to the inby point of travel. The final rule adopts this suggestion and requires separation by permanent stoppings to be maintained to the outby point of travel of the dolly or 600 feet from the point of deepest penetration, whichever distance is less, to separate the haulage entry from the primary escapeway. The provisions of § 75.380(g) continue to allow the district manager to require a greater or lesser distance for this separation.

In response to questions about acceptable construction methods and materials for permanent ventilation controls (excluding seals) MSHA proposed eliminating the definition of ''durable'' in paragraph (a) and to modify paragraph (e)(1). The proposal would have required these controls to be constructed in a manner and of materials that result in a construction that has been tested and shown to have a minimum strength of 39 pounds per square foot as tested under ASTM E72–80 Section 12—Transverse Load-Specimen Vertical, load only (ASTM E72–80). The 8-inch hollow-core concrete block stopping with mortared joints, to which all other constructions were tied under the definition of durable in the existing standard, has been tested and shown to have a minimum strength of 39 pounds per square foot.

MSHA received numerous comments questioning the validity of the ASTM E72–80 test for determining acceptability of underground ventilation controls. Commenters questioned the appropriateness of a strength requirement of 39 pounds per square foot and the relevance of this value to the in-mine conditions. After review, MSHA continues to believe that use of the ASTM E72–80 test to determine that the relative strength of a ventilation control construction is appropriate and the final rule retains this standard. However, MSHA sees merit in some of the suggestions made by commenters. Commenters suggested that some constructions can not be tested according to the ASTM test, some constructions that are widely used in coal mines do not meet the 39 pound per square foot threshold, and the ASTM test can only be run at a limited number of locations nationwide.

After reviewing all of the comments received and based on experience with various construction methods and materials used for permanent ventilation controls since the inception of the Mine Act, the final rule recognizes traditionally accepted construction methods for permanent ventilation controls, and retains the ASTM test for new materials and methods. Controls made with new materials or methods must be comparable in strength to controls made with traditionally accepted materials or methods.

Since the inception of the Mine Act, a number of traditionally accepted construction methods have performed adequately and have served their intended function of separating air courses. These traditionally accepted construction methods are: 8-inch and 6-inch concrete blocks (both hollow-core and solid) with mortared joints; 8-inch and 6-inch concrete blocks dry-stacked and coated on both sides with a strength enhancing sealant suitable for dry-stacked stoppings; 8-inch and 6-inch concrete blocks dry-stacked and coated on the high pressure side with a strength enhancing sealant suitable for dry-stacked stoppings; steel stoppings (minimum 20-gauge) with seams sealed using manufacturer's recommended tape and with the tape and perimeter of the metal stopping coated with a suitable mine sealant; and lightweight incombustible cementatious masonry blocks coated on the joints and perimeter with a strength enhancing sealant suitable for dry-stacked stoppings. In addition, 4-inch concrete blocks may be used in the above applications in seam heights less than 48 inches. Tongue and groove 4-inch concrete blocks coated on both sides with a strength enhancing sealant suitable for dry-stacked stoppings may be used in coal seams of any height. The sealants referred to in this paragraph would be applied in the thickness recommended by the manufacturer. MSHA maintains a list of sealants which may be used for the above applications. This list is available at each MSHA District Office. The final rule would continue to permit these traditionally accepted construction

methods to be acceptable for the construction of ventilation controls.

For new construction methods or materials other than those used for the traditionally accepted constructions identified above, the final rule requires that the strength be equal to or greater than the traditionally accepted in-mine controls. Tests may be performed under ASTM E72–80 Section 12—Transverse Load-Specimen Vertical, load only, or the operator may conduct comparative in-mine tests. In-mine tests must be designed to demonstrate the comparative strength of the proposed construction and a traditionally accepted in-mine control.

As with the existing rule, the final rule would require, in paragraph (e)(1)(ii), that all overcasts, undercasts, shaft partitions, permanent stoppings, and regulators, installed after November 15, 1992, be constructed of noncombustible material. Also, like the existing standard, the final rule lists materials that would be suitable for these controls. The final rule would also continue to prohibit ventilation controls installed after November 15, 1992, from being constructed of aluminum.

Paragraph (h) of the proposal would have required that all permanent ventilation controls, including seals, be maintained to serve the purpose for which they were built. The final rule retains proposed paragraph (h) with one revision. One commenter stated that the paragraph should require all ventilation controls, including temporary controls, to be maintained to serve the purpose for which they were built. Given the importance of temporary controls devices in providing for adequate ventilation, the final rule requires all ventilation controls, both permanent and temporary, including all doors and seals, to be maintained to serve the purpose for which they were built. This standard applies to all ventilation controls, regardless of the construction date.

Relative to seal maintenance, MSHA does not intend that the maintenance requirement be applied to seals located within another sealed area. Additionally, the rule does not apply to seals which have become consumed within a gob area which is ventilated and evaluated in a manner approved in the mine ventilation plan.

One commenter raised several questions concerning what MSHA would consider to be an acceptable temporary stopping. MSHA has not defined the term ''temporary ventilation control'' in the rule. The commenter stated that, in the preamble to the proposal, MSHA refers to ''properly constructed'' temporary stoppings but does not include a standard for construction or installation and maintenance of temporary stoppings. The commenter adds that temporary ventilation controls are a source of potential leakage and are often susceptible to damage from roof and rib falls and from mobile equipment. The commenter also refers to several accidents where failure to maintain permanent or temporary ventilation controls was a critical factor in the accident.

MSHA agrees that to properly direct the flow of air and provide for adequate face ventilation, temporary controls, as well as all permanent ventilation controls, must be installed and maintained in an adequate manner to control leakage. MSHA has accepted as temporary controls, check curtains or other flame- resistant material approved by MSHA that are constructed and installed in such a manner to minimize leakage. As required by paragraph (h) of this section of the final rule, these controls must be maintained to serve the purpose for which they were built.

Section 75.334 Worked-Out Areas and Areas Where Pillars Are Being Recovered

Worked-out areas, areas where coal extraction has been completed, can pose deadly hazards to miners, including an explosive methane accumulation, irrespirable atmosphere, and the possibility of fire from spontaneous combustion. Section 75.334 establishes the requirements for ventilation of these areas to mitigate these hazards. In general, § 75.334 requires that following mining, these areas are to be sealed or ventilated. Section 75.334 also specifies the requirements for evaluating the effectiveness of the ventilation of worked-out areas so operators can determine that the ventilation system is functioning as intended.

The final rule revises paragraph (e) of the existing § 75.334. Existing paragraph (e) requires that each mining system be designed so that worked-out areas can be sealed. The final rule adds to paragraph (e) the proposed requirement that the location and sequence of construction of proposed seals be specified in the approved mine ventilation plan. Improper location and sequencing of seal construction can have a dangerous effect on mine air quality and ventilation. As the proper location and sequence of construction of seals is a mine-by-mine determination, the mine ventilation plan provides the most workable mechanism by which to assure proper air quality and ventilation of the mine.

Several commenters objected to including seal construction sequence as part of the information to be submitted for approval in the mine ventilation plan. Their rationale was that mining conditions change and could result in a change in the sequence of seal construction. The construction might then be delayed while approval for the change is obtained. These commenters suggested that in some cases, delays in seal construction could result in a hazard to miners. Other commenters stated that the sequence of construction of seals is more appropriately and more easily shown on the mine ventilation map required by § 75.372. Another commenter stated that the sequence of construction should be subject to approval because the placement of seals if improperly installed can cause adverse effects on the ventilation system and gob gases. MSHA is sensitive to the concern that a delay in approval could result in a hazard to miners and, as explained in the preamble discussion of § 75.370, if a delay in seal construction would result in a hazard to miners the review and approval of the plan can be expedited.

MSHA agrees with the commenter that the location and sequence of seal construction may be more easily, that is, more clearly shown on the mine map required by § 75.372 than in the written text of the plan submitted under § 75.371. The existing standard permits appropriate information required under § 75.371 to be shown on the map required by § 75.372. The effect is that the information both appears on the ventilation map and in the ventilation plan and is subject to approval. The discussion of § 75.371(bb) further addresses this point.

Spontaneous combustion is the process through which coal or other materials self heat by the absorption of oxygen. Paragraph (f) of § 75.334 addresses mines with a demonstrated history of spontaneous combustion and those located in coal seams determined to be susceptible to spontaneous combustion. Paragraph (f) requires that the approved mine ventilation plan for these mines specify the measures that will be used to detect methane, carbon monoxide, and oxygen concentrations during and after pillar recovery, and in worked-out areas where no pillars have been recovered; the actions that will be taken to protect miners from the hazards of spontaneous combustion; and, if a bleeder system will not be used, the methods that will be used to control spontaneous combustion, accumulations of methane-air mixtures, and other gases, dusts, and fumes in the worked-out area.

Through meetings with various segments of the mining community, MSHA became aware of a concern that paragraph (f) of existing § 75.334 may have been promulgated without the public being provided the opportunity to adequately comment. Although MSHA believes that existing paragraph (f) was promulgated properly, the Agency reproposed paragraph (f) with wording identical to that used in existing § 75.334. The purpose of the reproposal was to assure MSHA received and considered all pertinent comments.

Several commenters to the existing rule suggested that bleeder systems should not be required for all mines. These commenters stated that in some mines the practice of ventilating worked-out areas increases the risk of spontaneous combustion by supplying oxygen to combustion-prone materials in these areas. They also requested that the final rule promulgated in 1992 include provisions to address spontaneous combustion. MSHA acknowledged the need to reduce the flow of oxygen to areas where there is a likelihood of spontaneous combustion, and included in the 1992 rule requirements for mine ventilation plans to address spontaneous combustion in mines with a demonstrated history of this hazard or mines that are located in coal seams determined to be susceptible to spontaneous combustion.

Experience gained through application of the existing standard has demonstrated that a limited number of mines have experienced spontaneous combustion problems. Studies by the Bureau of Mines have identified the volatile properties of coal seams and have determined that certain seams are susceptible to spontaneous combustion. The final rule is directed to mines in these seams.

MSHA is not suggesting that all coal mines will meet the test to show susceptibility to spontaneous combustion. A demonstrated history or the determination of susceptibility to spontaneous combustion is a prerequisite to the applicability of paragraph (f). While it is true that all coal oxidizes when exposed to air, this fact is not sufficient to make the determination that a coal seam is susceptible to spontaneous combustion. MSHA would expect that absent a demonstrated history of spontaneous combustion in a mine, an operator would provide the necessary data to demonstrate that the mine is susceptible to spontaneous combustion so that the provisions of paragraph (f) should apply. A number of methods are used to determine the self heating tendency of a coal.

However, MSHA is also mindful that some mines that have a spontaneous combustion problem may be unable to reduce the oxygen content to a sufficiently low level to mitigate spontaneous combustion. For these mines, a bleederless system may not be appropriate. To illustrate, it is well known that the oxygen level in a gob varies depending on the location where the measurement is made. For example, the periphery of a gob normally will have higher oxygen levels than the interior of the gob. The oxygen level in the interior of the gob is critical when dealing with spontaneous combustion. If conditions are such that the oxygen content in critical areas within a gob cannot be reduced below that necessary for a methane ignition to occur, a bleeder system may provide the most safety. MSHA specifically solicited comment on this subject; however, none was received.

Under paragraph (f)(1), the approved ventilation plans for mines that have or are susceptible to spontaneous combustion must specify measures to detect methane, carbon monoxide, and oxygen concentrations in worked-out areas. These measures must be taken during and after pillar recovery and in worked-out areas where no pillars have been recovered. The purpose of these measures is to determine if worked-out areas will be ventilated or sealed. If the methane concentration or other hazards in the worked-out area cannot be controlled while the mine is limiting airflow to avoid spontaneous combustion, it may be necessary to seal or to ventilate the worked-out area using a bleeder system. These measures also help to determine the extent to which the worked-out areas can be ventilated without increasing the spontaneous combustion hazard.

Under the provisions of paragraph (f)(2) the operator is required to specify in the mine ventilation plan the actions that will be taken to protect miners from the hazards of spontaneous combustion. Protections from the hazards of spontaneous combustion might include: Additional continuous monitoring of fire gases at strategic locations underground, increased air sample collection and analysis, trending of air contaminant data, increased examinations, and changes to the mine ventilation system such as redistribution of air or pressure balancing. This requirement would be triggered if the mine has a demonstrated history of spontaneous combustion, or, if an evaluation of the susceptibility of the coal seam to spontaneous combustion leads to a mine operator determination that a bleeder system should not be used.

One commenter stated that this rule is unnecessary because only a limited number of mines actually have a demonstrated spontaneous combustion problem. The commenter suggested that the petition for modification (variance) process should be used to address this issue, which would allow miners representatives to participate. The final rule does not adopt this approach. To the extent practicable, an objective of this rulemaking is to reduce the need for exceptions and paperwork. In this case, the existing mine ventilation plan process provides a ready-made mechanism for establishing the precautions necessary, on a mine-by-mine basis, to protect miners from the hazards of spontaneous combustion in a timely manner. In addition, under the final rule, miners representatives are afforded input into the mine ventilation plan.

Another commenter stated that paragraph (f) should be directed more to the detection and control of spontaneous combustion and not solely at its prevention. The commenter offered examples of detection and control techniques that could be used.

MSHA agrees that spontaneous combustion prevention, detection and control are all important when dealing with spontaneous combustion. The final rule recognizes, however, that while prevention is the goal, instances of spontaneous combustion will occur.

Another commenter stated that the preamble to the proposal was not correct in that it implied a need to limit airflow to avoid spontaneous combustion. The commenter states that, to avoid spontaneous combustion, miners must create a near-zero pressure differential across most areas of concern. MSHA agrees that creating a ''near-zero pressure differential'' will have the desired effect of limiting the airflow. In a paper entitled ''Examination of Bleederless Ventilation Practices for Spontaneous Combustion Control in U. S. Coal Mines'' presented at the 7th U.S. Mine Ventilation Symposium in June 1995, the authors report that their study revealed that restricting airflow into mined-out areas is recognized world-wide as a spontaneous combustion control measure and that when designing a bleederless ventilation system critical attention must be given to mine layout, seal construction, methane drainage, regulations, monitoring, and emergency procedures. In discussing the subject of air leakage, Koenning in a paper entitled ''Spontaneous Combustion in Coal

Mines'' presented at the 4th U.S. Mine Ventilation Symposium in June 1989, identified air leakage as the most often cited cause of spontaneous combustion. In both of these papers, the authors emphasize the need to properly design a bleederless ventilation system to reduce the likelihood of spontaneous combustion and achieve the level of worker safety desired. MSHA agrees with these authors that a bleederless ventilation system must be designed to encompass all of the factors identified. It was suggested by one commenter that measurement of carbon dioxide should be included in the requirements of paragraph (f). In discussing the gases required to be measured (methane, oxygen, and carbon monoxide), the commenter stated that these gases alone will not aid in the detection of spontaneous combustion in its incipient or developed stage. The commenter suggested that miners be required to monitor for carbon dioxide because, in the opinion of the commenter, the trend in the ratio CO/CO_2 is the only viable predictor.

MSHA sees merit in the measurement of carbon dioxide as well as other products of combustion to assist in the detection of spontaneous combustion. However, the ratio CO/CO_2 is not the only viable predictor of spontaneous combustion. One researcher suggested that carbon monoxide production is the earliest, detectable effect of spontaneous heating. Others have suggested, following a series of tests, that four gas ratios clearly indicated the development of thermal runaway, but only the $CO_2 -> O_2$ ratio gave an early warning of the heating in the coalbed.

As can be seen, a number of methods of predicting the onset of spontaneous combustion have been suggested. While paragraph (f)(1) requires only the measurement of methane, oxygen, and carbon monoxide, MSHA would not discourage operators from incorporating, as part of the mine ventilation plan, any or all of these methods as well as other appropriate methods to aid in the early detection of spontaneous combustion.

Section 75.340 Underground Electrical Installations

Electrical installations can provide an ignition source for methane and can represent a serious fire hazard underground. Typical electrical installations are battery charging stations, substations, rectifiers and certain water pumps. Section 75.340 requires that these installations be ventilated and protected against fire. These installations must also be housed in noncombustible structures or areas or protected with fire suppressions systems, and be ventilated or monitored to protect miners working down stream from the products of combustion.

MSHA proposed to revise paragraph (a) of existing § 75.340 to clarify the standard and to add requirements concerning alarms and sensors. The final rule adopts the language in the proposal with one modification. It replaces the word ''located'' with the word ''housed.''

Existing 75.340(a) requires that certain underground electrical equipment be either located in a noncombustible structure or area or equipped with a fire suppression system. Section 75.340 (a) also requires that the equipment be ventilated by intake air, and lists alternatives ways to do so in paragraphs (a)(1),(a)(2), and (a)(3). The final rule adds language to paragraph (a)(3), the alternative which establishes an acceptable means for monitoring the underground electrical installations using sensors other than a § 75.351 atmospheric monitoring system.

MSHA sought in the proposal to clarify the application of existing § 75.340(a)(3). Paragraph (a)(3) of the existing rule provides for the activation of doors upon the presence of certain indications of a possible fire. The paragraph was appropriate for enclosed structures or areas; but questions at informational meetings challenged its applicability to the alternative where a fire suppression system was used without an enclosure. To address the questions, the proposal placed the requirements for noncombustible structures or areas and for fire suppression systems into separate paragraphs. MSHA proposed that one of the alternatives for ventilating with intake air (monitoring the underground electrical installations using sensors other than a § 75.351 atmospheric monitoring system) was acceptable only if the equipment was located in a noncombustible structure or area and not acceptable if only a fire suppression system was used. This revision eliminates the confusion that existed with the existing rule. It should be noted that if an operator elects to locate this equipment in a noncombustible structure or area, the operator would not be precluded from also installing a fire suppression system.

One commenter questioned the reason for separating fire suppression and noncombustible structures, noting that there was no need for the distinction in the rule. In objecting to the proposal, the commenter stated that there should be several cumulative layers of protection, including both fireproof enclosures and fire suppression systems. The commenter includes several examples of fires involving compressors to illustrate this point. MSHA has addressed concerns relative to compressor fires in the final rule section dealing with compressors, § 75.344. Other examples cited by the commenter included explosions caused by mobile equipment and a fire that occurred on a power center located at the working section. The instances cited by the commenter are not relevant to § 75.340. The commenter argued that fire suppression systems have not worked and uses the compressor fires previously mentioned to illustrate the point. MSHA notes that there are numerous instances where the systems have worked. However, in the vast majority of these cases there is no documentation because there is no requirement for reporting fires that are extinguished within 30 minutes.

The final rule in paragraph (a)(1)(iii) revises existing paragraph (a)(3) of § 75.340 by adding 2 requirements. It adds a requirement that a visual and audible alarm be provided on installations if the (a)(1)(iii) alternative is selected. Also, when operating under this alternative, monitoring of intake air that ventilates battery charging stations must be done with sensors not affected by hydrogen.

Some commenters noted their agreement with these proposed changes. Noting that no single system is failsafe, one commenter suggested that all the requirements of § 75.340 be combined and made applicable in all cases. The requirements would include; noncombustible structures, fire suppression, ventilation directly to the return, additional communications, continuous AMS monitoring for carbon monoxide, methane, and hydrogen, along with automatic closing doors and temperature protection. After consideration of the comments and the underlying rationale, MSHA concludes that to require that the alternatives be applied cumulatively in every case would be infeasible or impractical. In addition, MSHA does not believe that these overly restrictive requirements are necessary in all circumstances.

Paragraph (a)(1)(iii) addresses electrical installations that are equipped with doors that automatically close when sensor readings reach certain levels. One of these action levels is a level for the optical density of smoke. In § 75.340 (a)(1)(iii)(B) of the proposal and the preamble discussion on page 26371, MSHA refers to the optical density of smoke of 0.05 per meter to characterize the sensitivity of smoke detectors. As discussed in MSHA's opening statement to the ventilation rulemaking hearings,

the value used for the optical density of smoke is based on information provided from the Bureau of Mines. MSHA pointed out that based on comments received from the Bureau of Mines, this number is incorrect and should be divided by 2.303 to conform to the internationally accepted term of optical density. No commenter took issue with this point. MSHA has made the correction in the final rule. One commenter suggested that optical densities be increased and based on an ambient to account for background dust. In contrast, another commenter suggested that the specified optical density should be reduced by half. MSHA has found insufficient justification to adopt either of these suggestions and believes that the specified 0.05, corrected to 0.022 based on comments from the Bureau of Mines, is the appropriate level for optical density used in § 75.340. Existing § 75.351 Atmospheric monitoring system (AMS), uses a level for optical density of smoke of 0.05 per meter. MSHA recognizes that the level in § 75.351 should also be corrected. MSHA intends to correct the level for optical density used in § 75.351 in a future rulemaking. In the meantime, MSHA will use an optical density of 0.022 per meter for purposes of § 75.340.

The visual and audible alarm required in paragraph (a)(1)(iii) must be situated so that it can be seen or heard by persons traveling in the intake entry immediately adjacent to the installation. It was suggested to MSHA that these electrical installations may be susceptible to fire and the fire could go undetected. The visual and audible alarms would provide additional safety at these installations by alerting miners in the area.

One commenter suggested that an alternative should be added to carbon monoxide or smoke detection. The suggested alternative would be to permit another means that would be approved by the district manager. This suggestion has not been adopted since both carbon monoxide monitoring and smoke detection have been shown to be effective and reliable and can be used.

One commenter stated that battery chargers located on working sections do not present the same hazards as those located outby, along the intake. The commenter suggested that chargers located on working sections should be exempted from § 75.340. MSHA disagrees. MSHA believes that battery chargers present the same safety hazards associated with other electrical equipment plus the charging of batteries results in the liberation of hydrogen. There is a demonstrated history of fires caused by battery chargers. The requirements are necessary to safely operate chargers, regardless of the location of the charger.

One commenter suggested that all water pumps should be exempted from § 75.340 because fire history is limited. The standard already exempts pumps that have limited fire hazard potential in paragraphs (b)(2) through (b)(6). Pumps outside of the listed categories do present hazards. As an example, a 200 horsepower pump exploded at a mine in Virginia after an extended period of being overheated. An example of a pump posing a limited hazard is an emulsion pump located at or near the section that is moved as the section advances or retreats. Emulsion pumps are considered for the purpose of § 75.340 to be water pumps.

Also, one commenter called attention to MSHA's omission of the word ''or'' in two places in § 75.340, Underground Electrical Installations. MSHA agrees that the omission was inadvertent and so stated in its opening statement at the ventilation hearings. In § 75.340, the word ''or'' has been inserted between paragraphs (a)(1) (i) and (ii) dealing with alternative ventilation requirements for noncombustible structures or areas and between paragraphs (a)(1)(iii) (A) and (B) setting out criteria that would govern the activation of automatic closing doors.

Another commenter suggested that the signal from the visual and audible alarms required by existing paragraph (a)(3) should be sent to a surface location at the mine rather than being located outside the installation. The commenter supported the suggestion by indicating that a quicker response would thus be provided since the alarm would be immediately noticed. In order to achieve an effective level of safety, MSHA has provided in paragraph (a)(1)(iii) that the visual and audible alarm be located outside of and on the intake side of the enclosure. This location will permit persons traveling in the intake entry immediately adjacent to the installation to see or hear the alarm. Paragraph (a)(2) allows the use of an alternative system using an AMS which would provide an alarm at the surface of the mine.

Finally, one commenter objected to the use of the word ''located'' in the phrase ''located in noncombustible structures or areas''. The commenter argued that MSHA should use the word ''housed'' and that the use of the word ''located'' actually reduces the protection intended by Congress. MSHA does not agree with that interpretation and maintains that in the context in which the word is used there is no meaningful distinction between the two words. However, because the word suggested by the commenter will not reduce safety and may add to the clarity of the rule for some readers, it has been adopted in the final rule.

Section 75.342 Methane Monitors

Methane monitors are a critical link in the safety protections designed to prevent mine explosions. Mounted on mining equipment which works directly in the face, these instruments provide the first warning that gas is being liberated in potentially dangerous quantities. Methane monitors are relied upon to shut down mining equipment automatically when gas concentrations reach 2 percent. The continued operation of mining equipment under these conditions can lead to a spark and catastrophic explosion.

The final rule revises paragraph (a)(4) which addresses maintenance and calibration of methane monitors that are required on underground mining equipment to provide a warning to equipment operators when the methane concentrations nears dangerous levels. Methane monitors also automatically deenergize the equipment when methane approaches the explosive range or if the monitor is not operating properly. The rule requires that trained persons perform maintenance and calibration of the methane monitors at least every 31 days and requires that calibration records be maintained. The final rule does not adopt the proposal which would have required that a written maintenance program be available for inspection.

Some commenters expressed the view that the proposed revisions were unnecessary and recommended that they be deleted from the final rule. Other commenters supported the proposed revisions and urged MSHA to adopt additional requirements as well.

Paragraph (a)(4) of the final rule requires that calibration and maintenance of the monitors be performed by persons properly trained in maintenance, calibration, and permissibility of the methane monitors. One commenter expressed the view that no change was needed to the existing rule. However, the rulemaking record also contains a number of examples in which poorly maintained or improperly repaired methane monitors have been found during the investigations of methane related accidents.

The final rule in paragraph (a)(4)(ii) requires that each operator maintain a record of all calibration tests of methane monitors. As with other recordkeeping requirements under the final rule, records must be maintained in a secure

book that is not susceptible to alteration, or may be kept electronically in a computer system so as to be secure and not susceptible to alteration. Some commenters recommended that a record be kept of all maintenance performed on a methane monitor, urging that a record is necessary to prove the maintenance is done. MSHA believes that the revisions contained in the final rule, together with the existing requirements, will assure an appropriate level of maintenance without the need for additional records of maintenance.

Some commenters expressed concern over the security of computer-based records, and offered examples of breaches of security in the banking and national security fields. Others, however, advocated the use of computers for the storage and retrieval of records as being highly accurate, requiring less storage space and facilitating data retrieval. MSHA agrees that security of required records is important. It is also MSHA's objective to make the final rule requirements for compilation and storage of records practical and in concert with modern methods. To this end, the final rule requires that the record of maintenance and calibration of methane monitors be maintained in secure books that are not susceptible to alteration, and also permits these records to be maintained electronically in a computer system so as to be secure and not susceptible to alteration. The calibration record will aid operators in tracking calibration activity and will serve as a check to assure that calibrations are being conducted at least once every 31 days. The record will also be reviewed by authorized representatives of the Secretary and miners' representatives to determine that calibrations are being conducted as required.

Paragraph (a)(4)(iii) of the final rule requires that operators retain the record of calibration tests for 1 year from the date of the test. Records are to be maintained at a surface location at the mine and made available for inspection by authorized representatives of the Secretary and the representative of miners. A discussion of comments concerning the use of computers to maintain records can be found in the General Discussion of this preamble.

Several commenters suggested that equipment not operated in the face area also be equipped with methane monitors. Commenters noted accidents which have occurred when this nonpermissible equipment has ignited methane in outby areas. Commenters also asserted that equipment used for the withdrawal of personnel during fan stoppages would be safer if methane monitors were provided. An opposing comment indicated that an expansion of the methane monitor coverage was not necessary since methane is rarely associated with outby areas. Because of the response time of methane monitors, and considering the speed at which most outby equipment normally operates, it is unlikely that a monitor would prevent a machine from entering a body of methane if such a concentration were encountered. MSHA believes that methane monitors are suitable and effective in face areas where coal is being cut, mined, or loaded. However, MSHA does not believe that an expansion of coverage to include all nonpermissible equipment is warranted.

A number of commenters recommended that methane monitors should be calibrated at least every 7 days rather than at least every 31 days as provided by the existing standard. One commenter suggested daily calibration. Commenters noted that methane monitors lose sensitivity and that response time increases with monitor age and after exposures to elevated methane concentrations. The existing requirement for calibration of methane monitors at least every 31 days parallels the recommendations of several manufacturers. The 31 day requirement establishes a maximum time interval between calibrations. However, the final rule also requires the operator to maintain methane monitors in permissible and proper operating condition. Thus, under unusual circumstances of use, it is possible that weekly or even more frequent calibration may be necessary to comply with the standard.

Comment was also received recommending an additional requirement that calibration records be countersigned by the Maintenance Supervisor or Chief Electrician at the mine. The final rule does not adopt this recommendation. The purpose of the calibration record required under the final rule is not the same as other records where countersigning is required by the final rule. Countersigning requirements are directed at informing upper mine management of hazardous conditions which require their attention. While the calibration record has the potential to assist mine management in identifying equipment problems, its main function is to assist operators in assuring that timely calibration is occurring.

The proposal would have required that operators adopt a written maintenance program for methane monitors. Commenters pointed out that the existing standard already requires all permissible equipment, including methane monitors, to be maintained in permissible condition. MSHA agrees.

Section 75.344 Compressors

Section 75.344 deals with the use of air compressors underground. As discussed in the introductory section of this preamble, MSHA stayed § 75.344(a) because of a concern over a possible overheating or fire hazard. Improperly used or maintained air compressors can present a significant risk of fire underground. MSHA determined that the cause of the 1984 fire at the Wilberg Mine that claimed the lives of 27 miners was an improperly maintained compressor. In general, § 75.344 requires that most compressors be operated only while attended or located in a noncombustible structure or area that is monitored for temperature and carbon monoxide or smoke; have a fire suppression system; and, automatically shut down in the event of a fire.

The final rule revises the existing § 75.344, including the stayed paragraph (a), and supersedes interim § 75.345. The final rule recognizes that in some cases compliance with the existing rule could result in heat buildup when a compressor is located in a noncombustible structure or area. To address this possible hazard the final rule provides an option. A compressor would be acceptable when not located in a noncombustible structure or area provided it is continuously attended by someone who can see the compressor at all times, activate the fire suppression system and shut off the compressor. Also, the existing rule is modified for compressors that are located in a noncombustible structure or area. They must be ventilated by intake air coursed directly into a return air course or to the surface and equipped with sensors to monitor for heat and for carbon monoxide or smoke. In addition, upon the activation of the fire suppression system, the compressor must automatically deenergize or shut off.

The final rule does not include proposed paragraph (b)(2) which provided an additional alternative means of ventilating compressor installations located away from working sections and near a return air course where a substantial pressure differential exists.

Comments were solicited on the exemption for compressors having a certain maximum horsepower. Comments were received both supporting and opposing a possible revision to increase the limit from 5 to 30 horsepower. Because of the history of compressor fires, including the 1984 Wilberg mine disaster which resulted in

27 fatalities, the existing limitation of 5 horsepower has not been revised. One commenter questioned the proposal reference to 9 mine fires which started in compressors between 1970 and 1992. The commenter suggested that the nine fires was inaccurately low and referenced an MSHA report which stated that 21 compressor fires occurred between 1977 and 1987. The preamble discussion addressing the number of fires was in relation to underground coal mines. Other compressor fires have occurred at surface coal mines and at noncoal mines. Regardless of the number of compressors affected, however, the safety concerns remain the same.

Several commenters suggested that the cutoff for application of § 75.344 be changed from 5 horsepower for all compressors to 30 horsepower for reciprocating compressors and 5 horsepower for all other types of compressors. The rationale for this recommendation was that reciprocating compressors of up to 30 horsepower contain about the same amount of lubricating oil as 5 horsepower compressors. This suggestion was not included in the proposal, based on MSHA information (Report No. 06–292–87 of the Industrial Safety Division, Pittsburgh Safety and Health Technology Center) that the predominant hazard for fire or explosion in reciprocating compressors is not the lubricating oil, but rather the formation of carbonaceous deposits in the discharge system. MSHA received comments addressing the formation of carbonaceous deposits in the discharge system indicating that the use of synthetic oil prevents any carbonaceous accumulation. Commenters suggested that all identified hazards would be eliminated through the use of synthetic oils. However, commenters also noted that synthetic oils have a higher flash point.

MSHA has examined the subject of synthetic oils and found that synthetic oils can be formulated with polyalphaolefins, polyglycols, silicones, esters, phosphate-esters, and di-esters as the primary ingredient. These compounds are also blended with mineral oils to form synthetic lubricants. The rate of oxidation is varied among these compounds. Of these types, only silicone based lubricants exhibit virtually no oxidation and are used primarily where extremely high temperatures are expected. Also, silicone based lubricants are inherently fire resistant. Unfortunately, silicone based lubricants are incompatible with reciprocating compressors and will rapidly lead to failure of the compressor. Polyalphaolefins, polyglycols, and mineral oil blends all contain hydrocarbons and have a tendency to varnish and create deposits in air compressors. Accordingly, the final rule, like the existing rule, exempts compressors of five horsepower or less and the suggested revision to 30 horsepower has not been adopted.

One commenter stated that modern compressor technologies allow for much safer rotary screw compressor operation using non-defeatable programmed safety controls, synthetic lubricants, automatic fire suppression and shutdown, and other precautions. Although synthetic lubricants offer some safety enhancement, they do not fully mitigate the hazards. Also, considering the accident history including the Wilberg disaster, MSHA has not provided an exemption for rotary screw compressors.

Existing § 75.344 (a)(1) requires all compressors to be located in noncombustible structures or areas and to be equipped with a heat-activated fire suppression system. During informational meetings it was brought to MSHA's attention that in some instances requiring compressors to be inside such a structure could present a hazard through compressor overheating. Upon reviewing this potential effect of the regulation, MSHA agreed. Therefore, before the existing standard could become effective, MSHA stayed the application of paragraph (a)(1) and included the standard in this rulemaking.

The final rule addresses the potential of compressor overheating by allowing a compliance alternative to enclosing the compressor. Heat is generated at considerable rates by operating compressors. Improperly used or maintained compressors can present a significant risk of fire. To minimize this hazard, the rule specifies other installation and operational requirements as well as providing for fire detection and fire suppression. As recommended by commenters, the final rule also provides for audible and visual alarms and automatic deenergization or shut-off.

Several commenters discussed the proposed revisions to paragraph (a). One commenter urged that the term ''operation'' be clarified, noting that compressors which are designed to automatically start when necessary to rebuild air pressure should be protected. MSHA considers compressors that are installed to automatically start when necessary to rebuild air pressure to be in operation. MSHA agrees that these compressors should be provided either a noncombustible structure (or area) or an attendant. Accordingly, for the purpose of clarifying the requirement, the final rule includes the commenter's recommendations. Compressors which have been disconnected from the power or fuel source would not be subject to the requirement under the final rule.

Another commenter suggested that the person specified in paragraph (a)(1) be trained. The commenter noted that the attendant would be of little value if unaware of the appropriate response to a fire. The commenter suggested that the person know how to deenergize the machine and activate the fire suppression system manually. MSHA agrees and notes that this knowledge is required under the proposal by requiring that the attendant be capable of performing these tasks. MSHA believes that any training necessary to meet this capability is implicit in the standard and the proposal has been retained under the final rule.

Another commenter suggested that an attendant be accepted as an alternative to noncombustible structures or areas for a maximum of 8 hours. The commenter stated that 8 hours would provide sufficient time for urgent roof bolting or construction work such as coating stoppings or powering a jack hammer. After considering the comment, the suggested time limit has not been adopted. MSHA believes that a continuous attendant, always within sight of the compressor and capable of responding as required, provides a level of protection equivalent to the protection provided by an enclosure. Therefore, the final rule allows either alternative to be selected. It should also be noted that the final rule has been revised to require either a continuous attendant or containment in a noncombustible enclosure or area.

One commenter suggested that an alternative be provided in the rule to allow for video monitoring of compressors as an alternative to attendance or noncombustible enclosures. MSHA has not adopted the suggestion since video monitoring would not provide an equivalent level of safety compared to either an enclosure or attendance. There would be a considerable time delay in responding to a video monitor as compared to a nearby attendant who could immediately shut down the compressor, activate fire suppression, discharge fire extinguishers, apply rock dust, and take other necessary actions.

Other commenters addressed an allowable distance within which the compressor attendant must remain. In the preamble to the proposal, MSHA solicited comments on the proposed language, ''can see the compressor at all times'' versus having the attendant

remain within some specified distance. Rationale was solicited for any specific distances suggested. Several commenters supported the proposal, noting that adjustment is inherently provided for high mining heights and seam undulations since a low undulating seam would cause the attendant to remain closer to the compressor. Another commenter suggested that a maximum distance of 20 feet be specified. The commenter reasoned that a maximum distance of 20 feet would assure that the attendant could react to a fire quickly, noting that a compressor fire would propagate rapidly. The commenter also voiced a concern over travel time in low height mines and noted that distances over 20 feet might allow a fire to get out of control before the attendant could reach the machine.

Another commenter was concerned with the proposed requirement in (a)(1) that a person be able to see the compressor at all times. The commenter suggested that the term ''close proximity'' be adopted noting that a person could be in close proximity, e.g. in an adjacent crosscut, but not within sight. The commenter suggested that this should be acceptable since the person would still be able to activate the fire suppression system. MSHA disagrees. The suggested situation is not acceptable since a considerable delay could result before detection of a problem if the person were not within sight of the compressor. In such a case the person would be relying on the smell of smoke or some indirect means of detecting a problem. Because of the potential fire hazard associated with compressors, reaction time is critical. MSHA continues to believe that reaction time is appropriately minimized if the assigned person can see the compressor at all times, is capable of deenergizing the unit, and is capable of activating the fire suppression system. While agreeing that reaction time is critical and after considering all of the comments, MSHA finds the arguments for not specifying a set distance to be more persuasive. Therefore, the final rule permits compressors to be continuously attended by a person designated by the operator who can see the compressor at all times during its operation. Any designated person attending the compressor must be capable of activating the fire suppression system and deenergizing or shutting-off the compressor in the event of a fire.

If a compressor is not enclosed in accordance with (a)(2), the compressor can be operated only while it can be seen by a person designated by the operator according to (a)(1). In adopting this approach, the proposed paragraph (a)(1) language was deleted. Commenters indicated confusion over the similarity of proposed paragraphs (a)(1) and (b)(1) of the existing rule. The final rule combines these two requirements in (a)(1). The final rule requires both that the person be able to see the compressor and be capable of activating the fire suppression system.

Paragraph (a)(2) of the final rule requires that compressors, if installed in a noncombustible structure or area, be ventilated by intake air coursed directly into a return air course or to the surface and be equipped with sensors to monitor for heat and for carbon monoxide or smoke. MSHA expects that an air quantity sufficient to cool the compressor will be provided through the enclosure. The manufacturer's operation manuals for compressors often specify an air quantity or a maximum ambient temperature. The sensors required by paragraph (a)(2) must deenergize power to the compressor, activate a visual and audible alarm located outside of and on the intake side of the enclosure, and activate doors to automatically enclose the noncombustible structure or area when either of the conditions in paragraph (a)(2)(i) or (ii) occurs. The visual alarm should be situated so that it can be seen by persons traveling in the intake entry immediately adjacent to the enclosure. The sensors must also deenergize or shut-off the compressor in addition to closing the doors of the enclosure.

Paragraph (a)(1)(ii) specifies that the sensors shall deenergize power to the compressor, activate a visual and audible alarm located outside of and on the intake side of the enclosure, and activate doors to automatically enclose the noncombustible structure or area when the carbon monoxide concentration reaches 10 parts per million above the ambient level for the area, or the optical density of smoke reaches 0.05 per meter. These levels are the same as required by the existing rule. As discussed in MSHA's opening statement at the ventilation rulemaking hearings, the value used for the optical density of smoke is based on information provided from the Bureau of Mines. MSHA pointed out that, based on comments received from the Bureau of Mines, this number is incorrect and should be divided by 2.303 to conform to the internationally accepted term of optical density. MSHA's remarks were made in reference to the requirement in § 75.340(a)(1)(iii)(B). The final rule also makes a conforming technical revision to § 75.344(a)(2)(ii).

Paragraph (e) of the final rule requires automatic deenergization or automatic shut off of the compressor if the fire suppression system of paragraph (b) is activated. A number of commenters suggested that compressors should have an automatic shutdown feature that deenergizes or shuts-off the compressor when the required fire suppression system is activated. MSHA agrees. MSHA recognizes that under § 75.1107–4 automatic deenergization is required if the automatic fire suppression system is activated on unattended electrically powered compressors.

Proposed paragraph (b)(2) has been omitted from the final rule. The paragraph was intended to provide additional flexibility for compressor installations located away from working sections and near a return air course where a substantial pressure differential exists. No comments were received in support of the proposed standard, while a number of comments were received in opposition. Commenters objecting to the standard raised concerns about overheating and stated that the revisions were made unnecessary in view of modified paragraph (a). MSHA agrees. Historically, when compressors that are on fire continue to operate, they often released oil into the environment, thus increasing the severity of the fire. For this reason, MSHA believes that safety is best served by requiring compressors to be deenergized or shut-off when the fire suppression system is activated. Commenters recommended deenergization in (a)(2) of the final rule. MSHA agrees and has the included automatic deenergization in (a)(2). One commenter suggested that alarms be automatically given at the section and surface and that two-way communications be provided at each compressor installation. This recommendation has not been adopted since the rule provides the desired level of safety through venting to the return, automatic fire extinguishment and closure of doors, in addition to the alarms outside the enclosure.

Section 75.360 Preshift Examination

The preshift examination is a critically important and fundamental safety practice in the industry. It is a primary means of determining the effectiveness of the mine's ventilation system and of detecting developing hazards, such as methane accumulations, water accumulations, and bad roof.

A considerable number of comments were received representing a range of opinions on the changes MSHA proposed. After consideration of all comments received, the final rule

adopts certain modifications and clarifications to the existing standard to increase the effectiveness of the preshift examination. The final rule removes paragraph (e), redesignates existing paragraphs (f) through (h) as (e) through (g), revises paragraphs (a), (b), and (f) and adds new paragraphs (b)(8) through (b)(10).

Existing paragraph (a) is divided into paragraphs (a)(1)and (a)(2) in the final rule. Paragraph (a)(1) of the final rule contains the existing general requirement that preshift examinations are to be conducted by certified persons designated by the operator. Paragraph (a)(1) also modifies the existing and proposed language in response to comments, to provide for preshift examinations at 8-hour periods. Paragraph (a)(2) of the proposed rule would have allowed pumpers to conduct an examination in lieu of the preshift examination under certain conditions. The final rule adopts this approach with 2 changes. The final rule does not require the pumper to examine for noncompliance with mandatory safety and health standards that could result in a hazardous condition and does require that records be made and retained in accordance with § 75.363.

A number of commenters addressed the application of this standard at mines where extended, overlapping, or other novel working shifts are employed. MSHA agrees with commenters that evolution within the industry in shift scheduling has presented a number of questions and controversies regarding the standard which must be resolved to assure that proper preshift examinations are conducted within suitable time frames. Based on comments, the final rule adopts a modification to clarify and standardize the application of the preshift examination in recognition of the use of novel shifts while maintaining the protection of the existing standard.

Underground working schedules of three 8-hour shifts per day were virtually standard when the previous rule was implemented. Currently a substantial number of mining operations have work shifts of more than 8 hours. Other operations stagger or overlap shifts providing for continuous underground mining activities. Some mines that operate around the clock schedule persons to begin shifts at one- or two-hour intervals. In such cases, controversies and misunderstandings have developed regarding application of the current standard.

Commenters suggested that preshift examinations should be conducted for distinct 8-hour periods. Under this scenario a preshift examination for an 8-hour period would be acceptable for the entire 8-hour period regardless of shift schedules. Other comments indicate that this suggested modification would be consistent with the original intent and language of section 303(d)(2) of the Mine Act, which provides that no person, other than certified persons designated to conduct the examination, is permitted to enter any underground area unless a preshift examination of such area has been made within 8 hours prior to their entering the area. A commenter stated that to allow preshifts at more than 8-hour periods reduces the protection envisioned by the drafters of the Mine Act. MSHA understands the concerns and the critical nature of the preshift examinations to monitor the constantly changing conditions underground and has revised the rule accordingly to provide for an examination at 8-hour intervals.

Under the final rule, operators will establish the 8-hour periods for which preshift examinations will be conducted. Persons may enter or leave the mine, regardless of their shift schedule during any established period for which a preshift examination has been conducted. However, another preshift examination must be completed prior to the next 8-hour period if any persons, other than examiners, remain in the mine. As always, no person other than examiners may enter any underground area prior to the completion of a preshift examination.

The final rule requires three preshift examinations where persons are underground for more than 16 hours per day. At mines with only one 8-hour shift per day only one preshift examination per day would be required. Mines working 10-or 12- hour shifts would conduct preshift examinations for each 8-hour period during which persons are underground. MSHA agrees with comments that the original legislation of the Mine Act envisioned that preshift examinations would be conducted for each 8-hour interval that persons worked underground. Similar to the existing requirement, the final rule does not require examinations for designated 8-hour periods when no one goes underground.

MSHA recognizes that the final rule may cause a limited number of mines to perform examinations that are not currently required. These affected mines do not operate 24 hours per day but work one or two shifts which exceed 8 hours. For example, the final rule requires two examinations per day at a mine operating one 12-hour shift per day. When a mine operates two 10-hour shifts per day the final rule requires three examinations per day. The Agency has concluded that, considering the speed at which underground conditions can change, a reasonable period must be identified after which another examination is necessary. It is not MSHA's intent that the preshift be a continuous examination without a beginning or an end. Rather if the mine uses regular shifts that are longer than 8 hours in length, the preshift examination is good for an entire 8-hour interval. Those persons who start their work shift later than the normal shift start time do not need an additional preshift examination during the remainder of the 8-hour period. However, a preshift will be required if they are to stay in the area past the end of the 8-hour period. However, in accordance with longstanding practice, unplanned short excursions past the 8-hour period that occur infrequently will be accepted without an additional preshift. For example, miners required to stay an additional short period of time, such as 15 minutes to complete a mechanical repair, or due to a mantrip delay, would not need an additional preshift. The rule simplifies and clarifies the application of the standard at mines employing creative shift scheduling.

Comments were received suggesting that the regulation should stipulate 12:00 a.m., 8:00 a.m., and 4:00 p.m. as the beginning of the 8-hour periods for which preshift examinations would be required. This suggestion has not been adopted. There is no safety or health benefit to be gained through prohibiting operators from adopting other 8-hour intervals, e.g., 10:00 p.m., 6:00 a.m., and 2:00 p.m. Also, the standard is not intended to prevent operators from establishing their own work times. For example, an operator may elect a starting time of 11:00 a.m. for a weekend project provided the preshift is completed within the 3 hours prior to the beginning of the shift.

A commenter suggested that the final rule not require a preshift examination for non-coal producing shifts, where persons are to work in the shaft, slope, drift, or on the immediate shaft or slope bottom area. Under the commenter's suggestion, only that area immediately surrounding the bottom would need to be examined. The rationale given for the suggested change is that it is intended to bring the standard into conformity with ''certain state regulatory programs''. MSHA is not aware of state regulatory programs which would necessitate a change in the language of the final rule. Additionally, because areas where persons are not scheduled to work or travel are not required to be examined under the final rule, the

change is unnecessary. Therefore, the suggestion of the commenter has not been adopted.

Paragraph (a)(2) of the final rule provides that preshift examinations of areas where pumpers are scheduled to work or travel are not required prior to the pumper entering the areas, if the pumper is a certified person and the pumper conducts the specified examinations. This standard recognizes that pumpers travel to remote areas of the mine to check on water levels and the status of pumps, making regular preshift examinations impractical. The examinations required by pumpers include an examination for hazardous conditions, tests for methane and oxygen deficiency, and a determination of whether the air is moving in its proper direction in the area where the pumper works or travels. The examination of the area must be completed before the pumper performs any other work. A record of all hazardous conditions found by the pumper must be made and retained in accordance with § 75.363.

One commenter objected to the proposal stating that areas where pumpers work or travel should be preshift examined. The commenter stated that the proposed revision would weaken the protections provided under the existing standard, and that the rule would indirectly require that pumpers be certified. The commenter noted that most pumpers are not certified to perform examinations, and that it would be inappropriate to require ''hourly employees'' to obtain such certifications. The commenter further suggested that the proposed revision could infringe on the traditional relationship between labor and management wherein only management is required to be certified. The final rule does not require that pumpers be certified. Rather the final rule provides an option for pumpers to perform examinations for themselves if they are certified. Otherwise, areas where pumpers are scheduled to travel must be preshift examined by a certified person.

The final rule maintains the existing level of safety. A complete examination by a certified person is still required and the examination will be conducted closer to the time that work is performed in the area. As with other examination requirements, no one may accompany the pumper during the examination. It is important to note that the examination performed by the pumper under paragraph (a)(2) is not acceptable if other persons have been scheduled to enter the area. The pumper may only perform an examination in lieu of a preshift for himself or herself. If, however, after the beginning of the preshift examination, persons are assigned to enter the area, the pumper may perform a supplemental examination for other persons in accordance with § 75.361, provided that the certified pumper is designated by the operator to conduct such examinations.

Commenters asserted that pumpers cannot conduct quality examinations and effectively perform their normal work duties. Under a previous standard replaced in 1992, persons such as pumpers, who were required to enter idle or abandoned areas on a regular basis in the performance of their duties, and who were trained and qualified, were authorized to make examinations for methane, oxygen deficiency and other dangerous conditions for themselves. Under the final rule, either a preshift examination must be made in accordance with paragraph (a)(1) before a pumper enters an area, or certified pumpers must conduct an examination under paragraph (a)(2).

One commenter cited a 1984 incident at the Greenwich No. 1 mine where three miners were killed in an explosion while entering an idle area to work on a pump. The commenter suggested that an effective preshift examination would have prevented the accident and suggests that both a preshift examination and examinations by qualified pumpers should be required. An adequate preshift examination or supplemental examination as specified in the final rule, would prevent a similar result. One of these two examinations is always required under the final rule before persons enter any such idle area.

Also in addressing paragraph (a)(2), one commenter suggested that some certified persons who are pumpers may not conduct adequate examinations. According to the commenter, certified persons conducting examinations under paragraph (a)(2) cannot be expected to perform at the same level as preshift examiners conducting examinations under (a)(1). MSHA expects that all certified persons who are required to conduct examinations, including certified pumpers, will conduct the examinations in accordance with the standards.

Another commenter suggested that persons performing other jobs, such as rock dusters, should be permitted to perform examinations for themselves. Pumpers, unlike most other miners except mine examiners, travel in remote areas of the mine and normally work alone. Persons performing work such as rock dusting, however, normally work in newer areas of the mine where mining has only recently been completed and normally work as a part of a crew. Therefore, MSHA does not consider the work assignments to be similar enough to merit the same consideration and has not included this recommendation in the final rule.

As proposed, paragraph (a)(2) would have required that the certified pumper examine for noncompliance with mandatory safety or health standards that could result in a hazardous condition, test for methane and oxygen deficiency, and determine if the air is moving in its proper direction in the area to be worked or traveled by the pumper. A number of commenters recommended the deletion of the requirement that the certified pumper identify and record noncompliance with mandatory safety and health standards that could result in a hazardous condition. Commenters cited a number of objections: the requirement would detract from miner safety, would significantly and unnecessarily increase the burden on examiners, would diminish the quality of the examination, would require excessive judgment and discretion by the examiners, and require examiners to make predictions. After considering all submitted comments, MSHA concludes that these comments have merit and the final rule does not require certified pumpers to examine for violations of mandatory safety and health standards that could result in a hazardous condition.

Under paragraph (a)(2), a record of all hazardous conditions found by the pumper must be kept in accordance with § 75.363. One commenter objected in that all of the records resulting from a preshift examination would not be required of the pumper, such as the locations of air and methane measurements and the results of methane tests. The commenter suggested that the full preshift record should be produced just as if the examination were done according to paragraph (a)(1). In the case of the pumper-examined area, the records required under paragraph (a)(2) will assure that mine management is made aware of any condition which results in a hazardous condition and will facilitate corrective actions being taken. It is important to note that the pumper is conducting an examination in a limited area only for himself or herself. This is in contrast to the various areas addressed in paragraph (a)(1), where the examination is in anticipation of one or many other miners entering these areas usually on a regular basis, all of whom are relying on the examiner's findings. In these circumstances, it is important that a record is made which can be

utilized to spot ongoing problems and trends.

Paragraph (b) of the rule specifies the nature of the preshift examinations and the locations where a preshift examination is required. Proposed paragraph (b) would have required that the person conducting the preshift examination would examine for noncompliance with mandatory safety or health standards that could result in a hazardous condition. After considering all submitted comments, the final rule does not contain this requirement.

A number of commenters recommended the deletion of the requirement to identify and record noncompliance with mandatory safety and health standards that could result in a hazardous condition. Various commenters stated that the proposed requirement: would distract the examiner from the most important aspects of the preshift examination; would require predictions; would be an unrealistic expectation; and/or is designed only to facilitate enforcement actions. Commenters also suggested that the proposal would result in a shift in the focus of preshift examination from true hazards to noncompliance.

Other commenters objected that the proposed requirement to examine for noncompliance with mandatory safety or health standards that could result in a hazardous condition is so vague that it could detract from miner safety. One commenter suggested that the examiners would spend their time performing permissibility checks, torquing roof bolts, measuring roof bolt spacing, and similar tasks which represent a significant departure from the examiners traditional duties.

Another commenter expressed the opinion that paragraph (b) should require that all violations of mandatory safety or health standards be recorded and it should not be limited to those that could result in hazardous conditions. Preshift examinations assess the overall safety conditions in the mine; assure that critical areas are properly ventilated; assure that the mine is safe to be entered by miners on the oncoming shift; identify hazards, whether violations or not, for the protection of miners; and through this identification facilitate correction of hazardous conditions.

The preshift examination requirements in the final rule are intended to focus the attention of the examiner in critical areas. This approach is consistent with the fundamental purpose of preshift examinations which is to discover conditions that pose a hazard to miners. MSHA is persuaded that to require examiners to look for violations that might become a hazard could distract examiners from their primary duties. The final rule, therefore, does not adopt this aspect of the proposal.

Paragraph (b)(1) of the final rule adopts the proposal and clarifies that preshift examinations are to include travelways in addition to roadways and track haulageways. During informational meetings, commenters indicated that the terms ''roadways'' and ''track haulageways'' are associated with areas where mobile powered equipment is operated. By including the term ''travelways,'' the rule clarifies that areas where persons are scheduled to travel on foot are to be included, since hazards may also develop in these areas.

One commenter suggested that the proposal would greatly increase the area that must be preshift examined, even though the requirement is limited to only those travelways where miners are scheduled to work or travel. This commenter suggested that in large mines many more areas than would actually be used by miners would have to be preshift examined. The premise of the preshift examination is that all areas where miners will work or travel be examined for hazards. The final rule change concerning ''travelways'' is intended only to clarify that, when miners are scheduled to use these areas, they must be preshift examined first. The final rule, therefore, does not expand the existing scope to the preshift examination requirements.

The language of the existing paragraph (b)(1) referring to, ''* * * other areas where persons are scheduled to work or travel during the oncoming shift'' is transferred to a new paragraph (b)(10) with conforming changes, as proposed. MSHA received no comments on moving this provision to paragraph (b)(10). Commenters did respond to the phrase in proposed paragraph (b)(1) requiring preshift examinations of roadways, travelways and track haulageways where persons are ''* * * scheduled, prior to the beginning of the preshift examination to work or travel during the oncoming shift.'' The purpose of this proposal, which is adopted in the final rule with only clarifying changes, is to permit work and mining personnel to be rescheduled after the start of a shift. Preshift examinations, by their nature, must be completed before the start of the shift. Changes in conditions, however, such as a breakdown of equipment, can alter planned work schedules. To accommodate these circumstances, the final rule requires mine operators to design preshift examinations around the best information available at the time the preshift begins. If changes must be made, § 75.361 specifies that areas not preshift examined be covered by a supplemental examination performed by certified persons before miners enter the area.

One commenter objected that was confusing and should be modified. Other commenters foresaw possible abuses of the flexibility offered by the rule with some operators performing supplemental rather than preshift examinations, claiming that assignments were made after the preshift examination begins. After considering the comments, MSHA has retained the proposed flexibility to preshift examine areas where miners are scheduled to work or travel. To require more than this would be impractical.

Section 75.360(b)(3) of the final rule requires preshift examinations of working sections and areas where mechanized mining equipment is being installed or removed if anyone is scheduled to work on the section or in the area during the oncoming shift. A discussion of the reproposal of provisions concerning the installation and removal of mechanized mining equipment is presented in the General Discussion section of this preamble. As with the existing rule, the examination includes working places, approaches to worked-out areas, and ventilation controls on these sections or in these areas. The final rule, like the proposal, adds a new requirement that the examination also include a test of the roof, face and rib conditions on these sections or in these areas.

Proposed changes to paragraph (b)(3) not adopted in the final rule would have also required preshift examination of sections not scheduled to operate but capable of producing coal by simply energizing the equipment on the section. Also, proposed changes to paragraphs (c), (c)(1), and (c)(3) specifying where air volume measurements were to be taken on these sections have also not been adopted in the final rule.

The new requirement to test the roof, face and rib conditions is added because of the importance of this test to the safety of miners. In newly mined areas, checking roof, face and rib stability is most important to preventing injuries and death. Comments were received in support of the revision, citing accidents which might have been prevented had such tests been adequately performed during preshift examinations. One commenter, when suggesting new wording for paragraph (b)(3), indicated that the requirement to test the roof, face and rib conditions should be deleted but

did not offer any rationale for the suggested deletion. Another commenter suggested that the preshift examination should only require a visual examination of the roof, rather than a physical examination. Physical examinations of the roof, such as ''sounding,'' have been a historically accepted method for examiners to test roof competency. Whenever an examiner has a question as to whether a section of roof is competent, such a test should be performed.

Comments were mixed on MSHA's proposed revision to include idle working sections as part of the preshift examination. The proposal is not retained in the final rule. Some commenters objected to the proposal as unnecessary, burdensome, or impractical. Commenters believed that the existing § 75.361 requirement for supplemental examinations prior to anyone entering into such an area was sufficient. Commenters also stated that a preshift examination in these areas could introduce a false sense of security and that the effect would be to divert preshift examiners from more important duties. One commenter stated that the proposed requirement would be inconsistent with and contradictory to the basic concept of preshift examinations. Another commenter objected to MSHA's statement in the preamble to the proposal that there is a reasonable likelihood that miners will at some point during a working shift enter sections that are set up to mine coal.

In support of the proposed requirement to preshift examine idle sections, one commenter cited explosions at the Red Ash Mine in 1973, the Scotia Mine in 1976, the P&P Mine in 1977, the Ferrell #17 in 1980, the Greenwich #1 Mine in 1984, and the 1994 explosion at the Day Branch No. 9 Mine in Kentucky. As the commenter pointed out, in each of these accidents miners were sent into an area that had not been preshift examined. However, none of these accidents were the result of miners entering areas that would have been covered by the proposal. In each instance, miners entered an area where mining had ceased, but could not be resumed by simply energizing equipment. Another common thread in each of these explosions was the failure of the operator to conduct the required supplemental examination prior to miners entering the area on an unscheduled basis.

Paragraph (b)(4) of the final rule requires preshift examinations to include approaches to worked-out areas along intake air courses and at the entries used to carry air into worked-out areas if the intake air passing the approaches is used to ventilate working sections where anyone is scheduled to work during the oncoming shift. The examination of the approaches to the worked-out areas is to be made in the intake air course immediately inby and outby each entry used to carry air into the worked-out area. The examination of the entries used to carry air into the worked-out areas is to be at a point immediately inby the intersection of each entry with the intake air course. The standard is intended to assure that miners are not exposed to the hazards associated with ventilating working sections with contaminated air which has passed through a worked-out area. The requirement is consistent with the § 75.301 definition of ''return air'' and with § 75.332 which provides that working sections and other specified areas must be ventilated with intake air.

Commenters correctly noted that a clarification was needed in the first sentence of proposed paragraph (b)(4) to indicate that the examination at the specified points is only required if the intake air passing the approaches is used to ventilate working sections where anyone is scheduled to work during the oncoming shift. Commenters suggested that an examination should not be required if the intake air is not used to ventilate working sections or if no one is scheduled to work on the section. This was the result intended by the proposal and the final rule has been revised accordingly.

One commenter also suggested that the requirement in paragraph (b)(4) is unnecessary because the safeguards in the approved mine ventilation plan should prevent an air reversal in a worked-out area in which this air would enter the intake air course. The commenter offered the example of a worked-out area connected directly to a bleeder system. MSHA agrees that when proper safeguards are in place and operating as intended, air reversals are unlikely. However, roof falls and other obstructions in the worked-out area or in the bleeder can cause air reversals, permitting return air to enter the intake and be transported to the working section. Without a suitable examination, this condition would go undetected and could lead to disaster. While not exactly the same, the explosion at the Pyro Mine in 1989, which resulted in the deaths of 10 miners, was the result of a somewhat similar set of circumstances. A water blockage in the bleeder entry that combined with changes to certain ventilation controls led to methane migrating from the worked-out area onto the longwall face. MSHA's report of this accident concludes, in part, that changes that occurred during the mining of the longwall panel and in the bleeder entries caused a fragile balance of air flows to exist in the ventilation system that permitted methane to migrate from the gob and to accumulate near the longwall headgate.

One commenter agreed with the proposal and discussed the need to assure that miners are not exposed to the hazards associated with ventilating working sections with return air.

Essentially, the final rule requires that at each applicable approach, three examinations must be made; immediately inby and outby the approach in the intake entry and in the approach itself immediately inby the intersection with the intake entry. Situations exist where multiple openings along an intake lead into a worked-out area. Under some conditions intake air enters the upstream openings, passes through the worked-out area, and then re-enters the intake. The examination required by paragraph (b)(4) is designed to assure that such a condition is detected. Also, the examination detects any change in ventilation entering the worked-out area which may warrant follow-up or corrective actions to assure that the worked-out area is ventilated.

Paragraph (b)(6) of the final rule adopts the proposal modifying the existing rule. No comments were received on this aspect of the proposal. The final rule in paragraph (b)(6)(i) requires preshift examinations to include entries and rooms developed after November 15, 1992 (the effective date of the existing rule), and developed more than 2 crosscuts off an intake air course without permanent ventilation controls where intake air passes through or by these entries or rooms to reach a working section where anyone is scheduled to work during the oncoming shift. Similarly, under (b)(6)(ii) the examination must include entries and rooms developed after November 15, 1992, and driven more than 20 feet off an intake air course without a crosscut and without permanent ventilation controls where intake air passes through or by these entries or rooms to reach a working section where anyone is scheduled to work during the oncoming shift.

Existing paragraph (b)(6) requires that a preshift examination be made in all entries and rooms driven more than 20 feet off an intake air course without a crosscut or more than 2 crosscuts off an intake air course without permanent ventilation controls where intake air passes through or by these entries or rooms to a working section where anyone is scheduled to work during the oncoming shift. MSHA proposed

modifications to existing paragraph (b)(6) based on concerns raised following publication of the existing rule on May 15, 1992. Commenters at that time indicated that extensive rehabilitation would be required at a number of mines to implement the standard in the rooms and entries described in the rule, causing diminished safety for miners performing the rehabilitation work. Commenters noted that some areas had been timbered heavily and cribbed because of adverse roof conditions and that rehabilitation would unnecessarily expose miners to roof falls and rib rolls while removing or repositioning roof support. In addition, roof conditions in some areas would remain hazardous even after rehabilitation. The commenters also noted that many such areas had been in existence for many years without incident and that any methane liberation had long since stopped due to the passage of time. They noted that some areas cannot be effectively sealed and that the risks associated with rehabilitation and subsequent physical examinations would greatly outweigh the safety benefit to be gained. MSHA recognizes the legitimate concerns raised by the commenters and the final rule requires preshift examination of entries and rooms developed after November 15, 1992 and driven more than 20 feet off an intake air course without a crosscut or more than 2 crosscuts off an intake air course without permanent ventilation controls where intake air passes through or by these entries or rooms to a working section where anyone is scheduled to work during the oncoming shift. MSHA believes, however, that the conditions addressed by paragraph (b)(6) are the result of improper mining practices in the past. These mining systems should be revised in the future to avoid poor conditions, or the areas affected should be fully and reliably ventilated and be examined. Also, the final rule applies only to entries and rooms developed after the effective date of the existing rule. As such, the mining industry was on notice of the shortcomings of mining practices that left entries and rooms of the type addressed by the standard.

Paragraph (b)(8) retains the proposal requiring preshift examinations to include high spots along intake air courses where methane is likely to accumulate, if equipment may be operated in the area during the shift. As noted in the proposal, it has long been recognized that methane can accumulate in high areas with no indications being detected in the lower portions of the opening. As mobile equipment passes under these areas or a conveyor belt is put into operation, the methane is pulled down and mixed with the air in the entry and may be ignited. The final rule addresses the hazards of undetected accumulations of methane in high spots by requiring preshift examinations in such areas in intake air courses if equipment will be operated in the area during the shift.

Several commenters requested that MSHA clarify the term ''high spots.'' One commenter stated that many hours would be necessary to examine every indentation in the roof of a large mine and stated the belief that the turbulence created by passing equipment would render harmless any of the small amounts of methane that might possibly accumulate. Another commenter believed the requirement was unnecessary because there has never been a problem with methane accumulating in intakes in quantities sufficient to cause an explosion. One commenter suggested that the requirement should only be applicable to mines with a demonstrated history of methane accumulations, noting that although mines are considered likely to liberate methane, it is not likely that all mines will accumulate methane in high spots.

Another commenter suggested that preshift examinations should be required in all high spots in intakes, returns, belt entries, and track haulage entries. The commenter also objected to limiting the examination in intakes only to areas where equipment may be operated during the shift. The commenter observed that methane can accumulate quickly in high spots and that it is critical to detect the methane before it creates a danger. The commenter notes several accidents involving methane accumulations in high spots, including: Meigs No. 31 Mine in 1993 where methane in a roof cavity was ignited by a torch; VP–5 Mine in 1992 when methane in a cavity was ignited by a torch; Ferrell No. 17 Mine in 1980 where, according to the commenter, methane may have accumulated in a cavity in the belt entry roof and may have been ignited by a trolley powered vehicle; and in the VP–6 in 1982 where methane in a high spot was ignited by a trolley powered vehicle traveling through the area. The commenter stated that accumulations of methane in high spots can be ignited by any number of sources.

A meaningful preshift examination requires that conditions which can lead to an explosion or ignition be detected and corrected before miners begin their work. In addition to the accidents cited above attributed to methane accumulations in high spots, the Itmann No. 3 Mine explosion occurred when a trolley powered vehicle ignited methane in a high spot, resulting in the death of 5 miners and severe burns to 2 other miners. The phrase ''high spots where methane is likely to accumulate'' should be understood in the coal mining industry. Experienced miners, and in particular preshift examiners and certified persons, can readily recognize a high spot where methane is likely to accumulate. Also, MSHA for many years has considered preshift examinations to be inadequate where examinations did not include methane tests in these areas. An examination of ''every indentation,'' as foreseen by one commenter is not expected nor intended by paragraph (b)(8), which specifies that preshift examinations be used to identify methane hazards by testing in the appropriate locations. The final rule does not adopt the suggestion that methane examinations be based on mine liberation history since significant methane liberation may begin or can greatly increase at any time. Also, the potential for a dangerous accumulation of methane in a high spot is influenced by mine ventilation, particularly the air velocity in the entry.

One commenter suggested that the rule require tests only in ''unventilated high spots'' along intake air courses. The final rule does not adopt this approach. The purpose of the preshift examination is to detect hazards, in this case accumulations of methane. Nominal ventilation in a high roof cavity may not be sufficient to sweep away methane and an accumulation could exist. The final rule directs an examiner's attention to such situations.

Proposed paragraph (b)(9) is modified in the final rule. Paragraph (b)(9) of the final rule requires preshift examinations at underground electrical installations referred to in § 75.340(a), except those water pumps listed in § 75.340(b)(2) through (b)(6), and areas where compressors subject to § 75.344 are installed if the electrical installation or compressor is or will be energized during the shift. The proposal would have exempted all water pumps from the requirements of paragraph (b)(9).

One commenter objected to the exemption for pumps and recommended that all pumps be examined pointing out that some pumps are large, high-horsepower units. The commenter noted a 1994 case in Virginia where a 200 horsepower pump exploded. Pumps of this type may be in locations or in applications that would not be examined by pumpers under paragraph (a)(2). The final rule responds

to this issue by requiring that all pumps should not be exempted from the standard. Paragraph (b)(9) requires preshift examinations of all pumps, except those specified in § 75.340(b)(2) through (b)(6). Pumps specified in § 75.340(b)(2) through (b)(6) and other pumps that operate automatically or that otherwise may be energized are generally in the more remote areas of the mine and are to be examined weekly in accordance with § 75.364.

Pumps which will be examined by certified pumpers in accordance with paragraph (a)(2) are not covered by the final rule because of the limited hazards they pose and because certified pumpers would themselves conduct examinations of this equipment in accordance with paragraph (a)(2). Examinations by pumpers at these locations will assure that methane has not accumulated and that the equipment is not in a condition to create a fire or ignition source.

A review of the accident history reveals a number of fires in equipment that, under the final rule, would be subject to preshift examinations. For example, the compressor that MSHA identified as the probable cause of the fire in the Wilberg Mine, which killed 28 miners, would have required a preshift examination under (b)(9) of the final rule. Additionally, MSHA has identified several fires associated with rectifiers and transformer installations in the mining industry. One of these transformer fires was discovered during a preshift examination.

One commenter supported proposed paragraph (b)(9) and noted a number of ignitions involving trolleys. The commenter also noted that history demonstrates that other electrical installations present ignition or fire hazards which should be examined before each shift.

One commenter incorrectly understood proposed paragraph (b)(9) to not require preshift examinations of areas where compressors subject to § 75.344 are installed if the compressor is or will be energized during the shift. The standard does require preshift examinations of such equipment, which includes all compressors except those which are components of equipment such as locomotives and rock dusting machines and are compressors of less than five horsepower.

Paragraph (b)(10) adopts the proposal that preshift examinations include other areas where work or travel during the oncoming shift is scheduled prior to the beginning of the preshift examination. This provision recognizes that work requirements and situations may change after the preshift examination has begun. Often, once the examination has started it is not possible to contact the examiners to direct them to newly identified areas where miners will work. In these cases, a supplemental examination is required before persons work or travel in these areas. As discussed in the preamble to the proposal, paragraph (b)(1) requires preshift examinations of any underground area where persons are scheduled to work or travel during the oncoming shift. Under the existing rule, an operator did not have the flexibility to modify work assignments after the preshift examination had begun, unless it was possible to contact and redirect the examiners to perform a preshift examination before the beginning of the shift. Commenters in general supported the proposal. One commenter, however, while supporting the change expressed concern that the provision could be abused. MSHA does not anticipate abuse of the rule and believes it to be a reasonable approach to assuring that areas where persons work or travel are examined.

As discussed above, the final rule does not adopt the proposed revisions to paragraphs (c), (c)(1), and (c)(3) and instead retains the language of the existing standard. While commenters to proposed paragraphs (c), (c)(1), and (c)(3) objected to expanding air volume measurements made during preshift examinations to sections where coal could be mined by simply energizing the equipment, no comments were received objecting to retaining the requirement for areas where equipment is being installed or removed. An in-depth discussion of the reproposal of provisions concerning the installation and removal of mechanized mining equipment is presented in the General Discussion section of this preamble.

Paragraph (f) of the final rule sets out the requirements for recording and countersigning both the results of the preshift examination and actions taken to correct hazardous conditions found during the preshift examination. The final rule adopts the following proposed revisions to the existing rule: a record of the results of the preshift examination is required to be made; the results of methane tests are required to be made in terms of the percentage of methane found; and a certified person is required to record the actions taken to correct hazardous conditions found during the preshift examination.

Additionally, paragraph (f) of the proposal would have required countersigning by both the mine foreman and the superintendent or equivalent individual to whom the mine foreman reports. The final rule does not require this second level countersigning. Also, the final rule allows an official equivalent to a mine foreman to sign the records. Finally, the final rule allows for secure storage of records in a way that is not susceptible to alteration and the records can be kept in a book or in a computer system.

Commenters suggested that the final rule only require the examiner to record uncorrected hazardous conditions and not those which were corrected by the end of the shift. Commenters characterized the reporting of corrected hazardous conditions as unnecessary and unjustified by the accident history.

MSHA did not adopt the proposal to record corrected defects found during the fan examination required by § 75.312. MSHA believes, however, that a record of all hazards found during the preshift examination, including those corrected, is necessary. The record serves as a history of the types of conditions that are being experienced in the mine. When the records are properly completed and reviewed, mine operators can use them to determine if the same hazardous conditions are occurring repeatedly and if the corrective action being taken is effective. Additionally, this record can permit mine management, the representative of miners, and the representative of the Secretary to better focus their attention during examinations and inspections. The safety value of a complete record is illustrated by the 1989 explosion at Pyro Mining Company's William Station Mine in which 10 miners were killed. MSHA's accident investigation report concludes that methane concentrations of up to 6.5 percent were detected in the explosion area prior to the explosion but reports by the mine foreman for the shift failed to record the presence of these dangerous accumulations of methane or show the action taken to correct the condition. The investigation further found that the failure to record these methane accumulations in the appropriate record books prevented management officials and other interested persons from learning of the hazardous condition and initiating corrective action. In light of the record, the final rule adopts the proposal and requires the examiner to record the results, whether corrected or not, of the preshift examination and the action taken to correct hazardous conditions found during the preshift examination. This would include hazardous conditions and their locations and the results of methane and air measurements required to be made elsewhere in § 75.360.

As with other records required by this rule, the records of preshift examinations may be kept either in secure books that are not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration. A detailed discussion of record books and the use of computers to maintain records can be found in the General Discussion of this preamble.

A variety of comments were received regarding the countersigning of preshift records by the mine foreman, and the time permitted for countersigning. The final rule adopts the proposal that the mine foreman or equivalent mine official must countersign the record of the preshift examination by the end of the mine foreman's next regularly scheduled working shift. The mine foreman is in a position of responsibility for the day-to-day operation of the mine. It is essential for the health and safety of the miners that the mine foreman be fully aware of the information contained in the preshift examination reports so as to be able to allocate resources to address safety problems. Allowing until the end of the mine foreman's next regularly scheduled working shift to countersign the reports provides sufficient flexibility to make compliance practical while assuring that the mine foreman is aware of the results of the examination in a reasonably timely manner.

Some commenters suggested that the time for countersigning is unnecessarily long, and that the final rule should restore a previous requirement that countersigning be completed ''promptly.'' The term ''promptly'' involves ambiguity that is eliminated by specifying the time for countersigning the preshift examination record. The rulemaking record does not show that the time set by the final rule would expose miners to safety or health risks. Commenters suggested that the term ''mine foreman'' be replaced by a ''certified person responsible for ventilation of the mine or his designee.'' Another commenter suggested that the record could be countersigned by the mine foreman or any other mine official responsible for the day-to-day operation of the mine. Commenters stated that some operations no longer use the terms ''mine foreman,'' ''mine manager,'' or ''superintendent''. To provide for alternative management titles, the final rule incorporates the phrase ''or equivalent mine official.''

Numerous comments were received regarding the proposal for second level countersigning of the preshift examination record by the mine superintendent, mine manager, or other mine official to whom the mine foreman is directly accountable, within 2 scheduled production days after the countersigning by the mine foreman. The final rule does not retain this proposed requirement. A detailed discussion of the subject of second level countersigning can be found in the General Discussion section of this preamble.

Paragraph (f) of the final rule also contains revisions to the existing rule to allow for electronic storage of records. Paragraph (g) requires that the records required by § 75.360 be maintained at a surface location at the mine for one year and be made available for inspection by authorized representatives of the Secretary and the representatives of miners. A discussion of comments concerning the use of computers to maintain records can be found in the General Discussion of this preamble.

Section 75.362 On-Shift Examination

Like the preshift examination, the on-shift examination of working sections is a long accepted safety practice in coal mining. As coal is extracted, conditions in the mine continually change and hazardous conditions can develop. Because the mining environment changes constantly during coal production, this examination identifies emerging hazards or verifies that hazards have not developed since the preshift examination. Generally, the on-shift examination includes tests for methane and oxygen deficiency, an examination for hazardous conditions, and air measurements at specified locations.

The final rule adopts proposed § 75.362 with the exception that revisions have been made to the proposed provisions dealing with an examination for compliance with the mine ventilation plan requirements for respirable dust control.

The final rule redesignates existing (d)(1)(i) and (ii) as (d)(1)(ii) and (iii), revises paragraphs (a)(1), (c)(1), (d)(1)(iii) and (d)(2), removes paragraph (a)(2), and adds new paragraphs (a)(2) and (d)(1)(i). Additionally, the requirements of existing paragraphs (g) and (h), recordkeeping and retention, are transferred to § 75.363, Hazardous conditions, posting, correcting, and recording. New paragraphs (g)(1) and (g)(2) are also added by the final rule.

The word ''on-shift'' has been added to the first sentence of paragraph (a)(1) for clarity and consistency with other paragraphs of § 75.362. MSHA did not receive any comments on this proposed revision. Paragraph (a)(1) is also revised as proposed to require a certified person designated by the operator to conduct an on-shift examination of each section where anyone is assigned to work during the shift and any area where mechanized mining equipment is being installed or removed during the shift. The existing rule required that an on-shift examination be performed only on sections where coal is produced and areas where mechanized mining equipment is being installed or removed. Some commenters agreed that many of the same hazards exist on a section whether coal is being produced or not. Commenters gave several examples of activities that take place on non-coal producing sections including equipment repair and maintenance, cutting and welding, rockdusting, clean-up, and roof bolting. As indicated by these commenters, all of these activities present the potential for a serious accident. One commenter arguing against the proposed change stated that the preshift and supplemental examinations already address the safety concerns to which the proposal was directed. While MSHA considers the preshift and supplemental examinations to be of great importance in providing a safe work environment, these examinations are performed prior to workers on a shift entering the mine or, in the case of the supplemental examination, in an area of the mine that has not been preshift examined. The on-shift examination is intended to address hazards that develop during the shift. The concept of the on-shift examination is not new. On-shift examinations of coal producing sections have been required since the enactment of the Federal Coal Mine Health and Safety Act of 1969.

Another commenter arguing against expanding the on-shift examination requirement to non-coal producing sections stated that requiring on-shift examinations of areas other than working sections would detract from other required examinations. On-shift examinations on coal producing sections are normally conducted by section foremen who spend the vast majority of the shift on the section they are supervising. These individuals will not normally conduct the on-shift examinations in non-coal producing sections. These examinations will be conducted by certified persons assigned to work in these areas or other certified persons assigned to conduct these examinations. MSHA does not, therefore, foresee reduced attention to examinations in working sections.

Another commenter suggested that the requirements for on-shift examinations be expanded further than proposed. The commenter stated that many of the same types of activities that

occur on non-production shifts on the sections also occur in outby areas of mines. In support of this recommendation the commenter pointed to 4 explosions which occurred in outby areas of the mines. Those accidents were the explosions at the Greenwich Collieries No. 1 Mine in Pennsylvania in February 1984 where 3 miners were killed; the explosion at the Day Branch Mine in Kentucky in 1994 where 2 miners lost their lives and; an ignition at the Loveridge No. 22 Mine in West Virginia in 1992 that burned 1 miner. In each accident, several violations of safety standards contributed to the explosion or ignition, including inadequate or entirely omitted examinations required by standards in effect at the time. Compliance with those safety standards would have significantly reduced the likelihood of these tragic accidents occurring. Likewise, requirements of this final rule, such as the requirements for preshift and supplemental examinations in areas where persons are assigned to work or travel, would have served well to prevent these accidents.

The final rule requirements for on-shift examinations focus on the areas most likely to develop hazards during a shift. Expanding the examination requirements further is not supported by the record nor needed for miner safety.

As proposed, the final rule also revises paragraph (a)(1) to clarify that sufficient on-shift examinations must be conducted to assure safety. One commenter suggested that MSHA should include language to require more than one examination if necessary for safety, as provided for in the previous standard. The final rule adopts this approach and requires that at least once during each shift, or more often if necessary for safety, a certified person designated by the operator must conduct an on-shift examination of each section where anyone is assigned to work during the shift and any area where mechanized mining equipment is being installed or removed during the shift. As with other changes to this section, comments were received both supporting and opposing the change. One commenter in opposition to the standard argued that although the operator is required to maintain a safe work environment at all times, documentation should not be required for each inspection that is made of the working environment throughout the shift. The commenter is correct in stating that the rule, in § 75.363, requires additional documentation. However, the only additional documentation required will be for hazardous conditions found during the additional on-shift examination conducted on non-coal producing sections where miners are working. The additional documentation required does not override the need for the standard. Another commenter suggested that the term ''more often if necessary for safety'' be changed to ''more often if necessary for safety as determined by the operator depending on the mining conditions at the time.'' This commenter stated that conducting additional checks for safety is a current practice and individuals working on the section, including the section foreman, are the most familiar with conditions in that area and should make the determination whether additional examinations are needed. MSHA agrees with this commenter that persons working on a section are in the best position to identify the need for additional examinations. The suggested language has not been adopted, however, because MSHA believes that this determination should not be limited to persons working on the section.

Another commenter supported the proposal and listed explosions that have occurred which, in the opinion of the commenter, could have been prevented had additional on-shift examinations been made. MSHA agrees that there are occasions when additional on-shift examinations are necessary for safety and, therefore, the final rule requires that on-shift examinations be conducted at least once each shift, or more often if needed for safety.

The final rule retains the existing provision of paragraphs (a)(1), (c)(1) and (c)(2) requiring an on-shift examination of areas where mechanized mining equipment is being installed or removed. An in-depth discussion of the reproposal of provisions concerning the installation and removal of mechanized mining equipment is presented in the General Discussion section of this preamble.

Paragraph (a)(2) adds a new on-shift examination requirement to address respirable dust control. Under the final rule, before coal production begins on a section, an examination for compliance with the dust control measures established in the mine ventilation plan must be completed. This examination includes measurement of air quantities and velocities, water pressures and flow rates, a check for excessive leakage in the water delivery system, and checks of the number of operating water sprays and their orientation as well as the placement of section ventilation control devices.

Assuring full compliance with these requirements is important in safeguarding the health of miners. Human and financial costs demonstrate the need for further attention. In 1990, approximately 2000 deaths were associated with Coal Worker's Pneumoconiosis and the total number of deaths between 1968 and 1990 were over 55,000. As of 1993, total annual Black Lung Program costs were over $1.3 billion and the cumulative total cost had exceeded $30 billion.

Agency experience shows that needed attention has not always been given to the proper functioning of respirable dust controls. For example, a series of special spot inspections, undertaken in 1991 to conduct checks of the dust control parameters during the course of working shifts, revealed that 21 percent of the 781 mining units sampled were not complying with one or more of their dust control parameters. In its 1992 report, an MSHA Task Group recommended coal mine operators be required to make periodic on-shift examinations to verify that the mine ventilation plan parameters are in place and functioning as intended. MSHA considers on-shift examinations of respirable dust controls an important part of reasonable and prudent respirable dust control strategy.

Several methods of measuring water spray pressures would be acceptable. For example, water flow and pressure can be monitored through the installation of an in-line water meter and a pressure transducer. Water pressure can also be measured by permanently installing a pressure gauge on a machine. Operators would determine the working relationship between the pressure gauge reading and the actual operating pressure at the sprays. Once the working relationship has been established, the gauge pressure could be used to indicate the actual spray pressure specified in the mine ventilation plan for a given number and type of operating sprays.

Measurement of any required water flow rate could be accomplished through the installation of a flowmeter. A flowmeter provides a direct and reliable measurement and is the preferred method of determining water flow rate. Another acceptable method of determining flow rate would be to establish the relationship between the water pressure and the spray orifice diameter, either through engineering data or through actual tests. Once established, the water pressure gauge reading could be used to reliably indicate a flow rate for a specific number of sprays at a given orifice size.

One commenter, while generally supportive of the requirement for an on-shift examination of respirable dust controls, expressed concern over permitting the use of in-line flowmeters

and pressure transducers. The commenter stated that leaks in the location of the flowmeter and pressure transducer could go undetected, resulting in a loss of pressure and flow at the sprays. MSHA agrees that undetected leaks could result in improper operation of the system. To address this point, the final rule has been revised from the proposal to require that a check for excessive leakage in the water delivery system be made during the on-shift. This commenter also suggested that use of incorrect spray nozzles could result in improper operation of the system that would not be detected with in-line flowmeters and pressure transducers. MSHA would expect that as part of the examination of the number of operating sprays a check would be made to assure that the proper sprays are being used.

The final rule requires that the number of water sprays and their orientation be included in the examination. While spray orientation is important in air-directing spray systems, such as sprayfans and shearer-clearers, MSHA does not intend that precise angles be determined during each examination. Rather, the examiner would be responsible for assessing whether the direction and orientation of the sprays are generally correct and in accordance with the requirements of the mine ventilation plan.

The final rule also requires that the working section ventilation and control device placement be examined for compliance with the mine's ventilation plan. Mine ventilation, particularly where coal extraction occurs, is a basic respirable dust control measure.

Any other respirable dust controls specified in the approved mine ventilation plan are also included in the scope of the examination required under the final rule. An example of such controls is the cleaning and maintenance procedures for a wet bed scrubber installed on a continuous mining machine. The examination would include a check to assure that air inlets and discharges are not plugged. It is not MSHA's intent that the air quantity produced by a machine-mounted scrubber be measured as part of the on-shift examination required by paragraph (a)(2), unless such a requirement is included as a part of the mine ventilation plan.

MSHA is aware that through advances in technology it may be feasible to continuously monitor air quantity and velocity, and spray water flow rate and pressure. Continuous monitoring offers the potential to further improve miner protection by providing real-time data on the performance and condition of key dust control measures. This information can be used to give early warnings of deteriorating dust controls, allowing corrective action to be taken before the dust control system fails to protect miners from excessive dust levels. Although continuous monitoring will eliminate the need for periodic physical measurements to verify proper operation of some dust controls, visual observation of other controls will still be necessary. Among these are the number and location of operating water sprays, their general condition and orientation, the section ventilation setup and control device placement, the check for excessive leakage in the water delivery system, and other control measures where performance and operating condition can only be assessed visually.

One commenter suggested that MSHA not permit the use of continuous monitoring in lieu of physical checks because technology to permit such monitoring is not as yet available. The final rule is intended to be sufficiently flexible to permit the use of new technology, such as continuous monitoring and sensing devices, and also to encourage the introduction of such modern equipment. The final rule does not require the physical measurement of the air velocity and quantity, water pressure and flow rates if continuous monitoring of the dust control parameters is used and indicates that the dust controls are functioning properly.

The on-shift examination of the dust controls is to be completed under the direction of a person who has been designated by the operator. The proposal would have required that a certified person conduct the examination. One commenter objected to this approach, suggesting that the completion of this examination would require considerable time and that a more thorough examination could be accomplished by a person(s) familiar with the equipment and the dust control measures being utilized. This commenter recommended that MSHA remove the word ''certified'', thus permitting the examination to be conducted by persons other than certified persons. A second commenter argued that the examination should be conducted by a single individual because other persons may be assigned to a section who are not familiar with the requirements of the mine ventilation plan for that section.

The final rule deletes the word ''certified,'' permitting on-shift examinations of dust controls to be conducted by one or more persons who are not certified individuals. However, the examination must still be conducted under the direction of a person designated by the operator and as set out in paragraph (g)(2), a certified person must certify that the examination has been completed. MSHA would expect that the person directing this examination would be present at the site of the examination while the examination is conducted.

Another commenter recommended that the final rule not specify the measurements that are to be made need during the on-shift examination of dust controls, and that the standard be rewritten to require such an examination be sufficient to assure compliance with the respirable dust parameters specified in the mine ventilation plan. Because it is possible to identify specifically some of the parameters that must be measured in all instances the suggestion of the commenter has not been adopted. By identifying these parameters in the final rule, misunderstandings over whether a plan specification is for dust control or methane control, for example, can be eliminated.

As proposed, paragraph (a)(2) would have required that the respirable dust control portion of the examination be made at or near the beginning of the shift and before production begins on a section. One commenter suggested that such a requirement would eliminate the common practice of changing shifts on the section without an interruption in production. MSHA recognizes that changing crews without an interruption in production has become a common practice in some areas and does not intend that this practice be changed by this rule. The final rule has revised the proposal so that when a shift change is accomplished without an interruption in production on a section, the required examination may be made any time within 1 hour of the shift change. In those instances when there is an interruption in production during a shift change, the final rule requires that the on-shift examination of respirable dust controls be made before production begins on a section. The proposed wording ''at or near the beginning of the shift'' has not been included in the final rule in recognition of the fact that production on a section could be delayed and not begun until well after the beginning of the shift. Because the purpose of the standard is to assure that dust exposures are controlled during mining, the on-shift examination must be conducted prior to the beginning of production in order to be most effective.

Other commenters objected to examining respirable dust control parameters for various reasons. Some commenters stated that operators are

required to comply with the requirements of the mine ventilation plan relative to dust control and a separate requirement is not needed. The measurements specified in the final rule are a practical way to provide reasonable assurance that miners are not being exposed to unhealthy levels of respirable dust. The purpose of these checks is not to restate the requirements for compliance with the mine's ventilation plan. Instead, as discussed above, the final rule is intended to bring needed attention to the proper functioning of dust controls before production begins.

Other commenters expressed the opinion that coal production should not be delayed until after the completion of the examination of dust controls. According to these commenters, this examination will take the certified person away from other examinations that must be completed to assure safety. As explained previously, the final rule has been revised to permit the changing of crews without an interruption in production. The completion of the on-shift examination of dust control parameters can be postponed for up to 1 hour when crews are switched out at the face. Additionally, the final rule has been revised to permit the examination of dust control parameters to be performed by a person(s) other than a certified person and to simply require the certified person to certify that the examination was completed. These revisions substantially reduce any delay in production that could have resulted under the rule as proposed.

Another commenter objected to the requirements of paragraph (a)(2) stating that examination of dust controls is unnecessary because all personnel are required to be trained in the requirements of all approved mine plans including the mine ventilation plan, and many of the required mine ventilation plan parameters are checked during the pre-shift examination. The commenter stated further that other parameters, such as number of water sprays and pressure, are checked by the equipment operators during the pre-operational inspection. In the opinion of the commenter, the proposed examination of dust control parameters is redundant and unnecessary.

The requirements of paragraph (a)(2) are not redundant with existing standards. There is no requirement for a pre-operational inspection of dust controls. For the reasons discussed above, MSHA considers examination of dust controls for proper functioning to be an important practical measure for protecting miners'' health. To the extent that these checks are currently being made by some operators, together with the flexibility of the final rule, the burden of making these checks is minimized.

The final rule requires in paragraph (a)(2) that deficiencies found during the on-shift examination of dust controls be corrected before production begins, or when crews are changed without an interruption in production, before production continues. The proposal would have required that deficiencies in the controls be corrected immediately. However, the final rule revises the proposal in response to one commenter who pointed out that the correction of deficiencies is important prior to production, in view of the purpose of the rule.

Another commenter suggested that the examination of dust controls be conducted after production begins so as to be more representative of production conditions. In contrast, another commenter observed that if the required dust control parameters are not being met before production is begun, it is unlikely that they will be met after production is started. This commenter suggested multiple examinations, one before production begins and one at some later time during the shift. MSHA agrees that if dust control measures are deficient before production begins it is unlikely that they will be corrected later in the shift. Therefore the final rule requires the on-shift examination of the dust control measures prior to the beginning of production. The final rule, however, does not include the recommendation for an additional examination of dust control measures.

Paragraphs (c)(1) and (c)(2) require certified persons conducting on-shift examinations to take air measurements at the same locations where air measurements are required during the preshift examination. This includes areas where mechanized mining equipment, including longwall or shortwall mining equipment, is being installed or removed. Reduced volume or velocity of air during the shift can contribute to increased levels of respirable dust, methane accumulations, or oxygen-deficient atmospheres. Checking the mine's ventilation system verifies that changes in the mine ventilation system due to the production process have not occurred.

The final rule removes the word ''working'' from paragraph (c)(1) to assure that the application of the standard would extend to all sections, consistent with paragraph (a). Many of the activities to which miners are assigned are on sections not normally thought of as ''working sections,'' a term associated with coal production. For purposes of § 75.362, a section in the mine is considered to be the area inby the loading point; or, in the case of the installation of mechanized mining equipment, inby the proposed loading point; or, in the case of the removal of mechanized mining equipment, inby the location of the last established loading point. The final rule requires in paragraphs (a)(1), (c)(1), and (c)(2) that the certified person conducting the on-shift examination examine the section in much the same way as it would be examined during a coal producing shift, including checking for hazardous conditions, testing for methane and oxygen deficiency, determining if the air is moving in its proper direction, and measuring the volume of air in the last open crosscut or in the intake of longwalls or shortwalls, as appropriate.

Some commenters objected to this provision stating that there is little safety benefit to requiring on-shift examinations on sections other than working sections where coal is being produced. The final rule does not limit on-shift examinations to ''working sections'' but includes other areas where persons are working. Hazards similar to those that develop on a coal producing section can also develop during a shift on sections that are not producing, but where personnel are assigned to work.

Paragraph (d)(1)(i) requires that at the start of each shift, before electrically operated equipment is energized, a qualified person test for methane at each working place. One commenter suggested that the existing standard is sufficient because quite often in today's mining practices equipment is already energized at the start of the shift since one equipment operator takes over from the previous operator and examinations for methane have been performed every 20 minutes as required by § 75.362(d)(1)(ii). MSHA does not agree that the existing standard is sufficient for a number of reasons. First, although the commenter is correct in stating that switching operators while the equipment remains energized is a relatively common practice it is not a universal practice. In mines where equipment is deenergized between shifts, the final rule provides for a test for methane in each working place prior to the equipment being energized. On sections in mines where equipment operators are switched while equipment remains energized, MSHA would consider a methane test performed during the previous 20 minutes under paragraph (d)(1)(iii) as sufficient to comply with the methane test requirement of paragraph (d)(1)(i) for the working place where mining is taking place. However, paragraph

(d)(1)(i) also requires that methane tests be made in other working places on the section not only in the working place where the equipment is being operated.

The final rule requires in paragraph (d)(1)(iii) that methane tests be made more frequently than 20 minutes if required in the approved mine ventilation plan at specific locations, during the operation of equipment in the working place. One commenter objected to this requirement expressing the opinion that the standard does not identify situations in which more frequent methane tests would be warranted and, therefore, operators could be faced with a requirement to conduct additional methane tests which are unwarranted and would result in the misallocation of safety resources. The final rule is intended to address situations such as an abnormally high methane liberation rate in a mine or an area of a mine that would warrant more frequent testing for methane. Like the existing standard the final rule requires this test to be made by a qualified person, not a certified person, thus in most cases the person who makes the test will be the machine operator. As a result, this test will not require that other safety-related activities be stopped to make a test for methane.

Under the existing rule, methane tests required by paragraph (d)(1) were to be made at the last permanent roof support unless the mine ventilation plan required that they be made closer to the face using extendable probes. Paragraph (d)(2) of the final rule revises this standard and requires that the methane tests specified in paragraphs (d)(1)(i) through (d)(1)(iii) be made at the face from under permanent roof support, using extendable probes or other means. Like the existing standard, paragraph (d)(2) requires that for longwall and shortwall mining systems, the tests are to be made at the cutting head. When mining has been stopped for more than 20 minutes, methane tests must be made prior to the start up of the equipment.

During informational meetings following the publishing of the existing standard, it became apparent that a large segment of the mining community felt that methane tests should be made as close to the working face as practicable without exposing miners to unsafe conditions. MSHA agrees that proper testing for methane at the face is essential for safe mining operations. The need for making methane tests at the face has been demonstrated by researchers and engineers from the U.S. Bureau of Mines and MSHA through work performed over the last 25 years. This work documents that in a working place the concentrations near the face are considerably higher than other areas in the working place. For example, Luxner, in Bureau of Mines Report of Investigation 7223, ''Face Ventilation in Underground Bituminous Coal Mines,'' published in 1969, reported methane concentration in excess of 5 percent as far back as 15 feet using both blowing and exhaust ventilation systems with a curtain-to-face distance of 20 feet. The concentration outby this location as reported by Luxner was between zero and 1 percent. Later, Haney, et al., also showed lesser concentrations of methane further from the face using various types of assisted ventilation systems.

A speaker at one of the public hearings on the proposal suggested that tests should be made at the last row of bolts and if 0.2 percent of methane is found at that location, a probe should be used to test at the face. The final rule does not adopt this recommendation because MSHA is unaware of any tests that relate the concentration of methane at the face with the concentration at the last row of bolts. Based on current knowledge, it is doubtful that such a direct correlation could be made because of the number of variables involved.

A recurring comment concerning taking methane tests at the face with a probe was that such a requirement will lead to an increase in the number of back injuries among miners. However, other commenters supported the requirement and stated that probes as long as 40 feet are currently being used in some areas of the country. Miners with experience in using these probes testified at the rulemaking hearings that although the long probes can at times be difficult to use, they are being used and are providing measurements of methane at the face in mines operating in coal seams as low as 37 inches.

The possibility of an increase in the number of back injuries is of serious concern to MSHA. However, after reviewing all of the written comments and testimony taken during public hearings, particularly that of miners having experience with the use of probes, MSHA is persuaded that this is a reasonable approach and will achieve the desired safety results without undue risk of back injuries.

Several commenters suggested that in lieu of requiring methane tests at the face, MSHA should permit the use of the methane monitor to satisfy the requirement. In making this recommendation, one commenter suggested that the methane monitors should not be required to be installed on face equipment if they cannot also be used to test for methane in unsupported faces. Methane monitors have proven reliable over the years and provide a second level of protection against methane ignitions. Methane monitors provide for methane detection at a fixed location while the use of a methane detector with a probe permits methane measurements to be made at various locations in the face area.

Historically, machine-mounted methane monitors have been used as a backup for the other required tests. This concept was exactly what Congress recognized in § 303(l) of the Coal Mine Health and Safety Act of 1969 (Coal Act). Discussing this provision, the conference managers noted ''...the methane monitor is an additional backup device for detecting methane and should not be construed as a substitute for the other tests and testing devices required in this title for detecting and controlling methane.'' H.R. Conf. Rep. No. 91–761, 91st Cong., 1st Sess. 80 (1969).

The final rule does not adopt the suggestion of commenters that methane monitors be accepted in lieu of the methane tests required by paragraph (d)(2).

Paragraph (g)(1) adopts the language of proposed paragraph (g) and requires that the person making the on-shift examination in belt haulage entries certify by initials, date, and time that the examination was made at enough locations to show that the entire area has been examined. As explained in the preamble to the proposal, the existing rule does not require certification that examinations were conducted in belt conveyor entries. Comments received expressed the view that without certification, no mechanism exists to verify that examinations were conducted in belt conveyor entries. Other commenters questioned what MSHA meant by ''enough locations.'' MSHA agrees with the commenter that the certification requirement should be added to the rule to provide a means to verify that the examination has taken place. With respect to the locations where the certification should be made, this certification process is a common practice in the industry and is required by several state regulations. The locations where certification would be expected to be kept are no different than those which were required for many years under the previous MSHA regulation and which have been commonly accepted in the industry. Paragraph (g)(2) is a new requirement relating to the certification of the examination of respirable dust control parameters. Under (g)(2), the person making the on-shift examination to assure compliance with the respirable

dust control parameters specified in the mine ventilation plan must certify by initials, date, and time that the examination was made.

Section 75.363 Hazardous Conditions; Posting, Correcting, and Recording

Section 75.363 is a new section requiring the posting, correcting and recording of hazardous conditions. The posting of hazardous conditions against entry is a time tested method for preventing accidents. Examiners, upon finding a hazardous condition, erect ''danger boards'' to alert persons traveling in the area of the presence of the hazard. In this manner, miners are prevented from inadvertently entering an area where a hazard exists. Section 75.363 requires that hazardous conditions be posted and access to the area be limited; that the hazardous conditions be corrected immediately or remain posted; and, that a record be made and maintained of the hazardous condition and the action taken to correct the condition. Records of the hazards and the actions required to correct the hazards provide valuable safety information about conditions in the mine and the effectiveness of corrective measures.

MSHA's final rule modifies the proposal in several ways. The final rule deletes the phrase ''or reported to'' that appeared in the first sentence of proposed § 75.363(a) and deletes the requirement for countersigning by a second level official. It specifies that, except for preshift or preshift type examinations, hazardous conditions shall be corrected immediately or posted until the conditions are corrected. The final rule allows for countersigning by an official equivalent to the mine foreman and provides for storage of records in either a secure book or in electronic media which is not susceptible to alteration.

It is essential that all hazardous conditions, regardless of when detected or by whom, be adequately addressed. Commenters suggested that the proposed standard be deleted because, in their opinion, other standards provide adequate coverage. One commenter interpreted the proposed standard as being directed at only those hazards found during the on-shift examination and supplemental examinations, because hazardous conditions found during the preshift and weekly are excluded from the standard. This commenter recommended rewriting the requirements for the on-shift and supplemental examinations to reflect the needed changes.

Section 75.363 is not directed only toward hazardous conditions found during examinations. Hazardous conditions occur and are found at times during the shift when examinations are not being made. Under the final rule, these hazardous conditions would also require posting, correction, and recording when found by the mine foreman or equivalent mine official, assistants to the mine foreman or equivalent mine official, or other certified persons designated by the operator to conduct examinations.

One commenter questioned whether the proposed standard was intended to assign new duties to the mine foreman and assistant mine foremen. The final rule does not impose additional responsibilities on the mine foreman and assistant mine foremen. However, these individuals are certified and routinely travel throughout the mine for purposes other than making examinations. The standard requires that hazardous conditions found by the mine foreman, assistant mine foreman, or equivalent mine officials, be treated the same as hazardous conditions found by other certified persons who have been designated to conduct examinations. That is, the hazardous conditions are to be appropriately posted, corrected, and recorded. The term ''equivalent mine officials'' has been added in response to commenters who suggested that the term ''mine foreman'' is no longer used at all mines.

Under paragraph (a) any hazardous condition found by the mine foreman or equivalent mine official, assistants to the mine foreman or equivalent mine official, or other certified persons designated by the operator to conduct examinations is to be posted with a conspicuous danger sign. The posting requirements of this section apply to every hazardous condition regardless of when it is found. Under the proposal, hazardous conditions reported to the mine foreman, assistants to the mine foreman or other certified persons designated by the operator to conduct examinations would have required posting. Commenters suggested that requiring hazardous conditions ''reported to'' these individuals would eliminate the judgement of the persons responsible for making decisions about whether or not a hazardous condition exists. One commenter suggested that the requirement, as proposed, could undermine the integrity of the certified person. The final rule is revised to require that hazardous conditions found by the mine foreman or equivalent mine official, assistant mine foreman or equivalent mine official, or other certified persons designated by the operator for the purpose of conducting examinations shall be posted with a conspicuous danger sign and shall be corrected immediately or remain posted. MSHA would expect that when a hazardous condition is reported to these certified persons, that the measures necessary to evaluate the situation and, if necessary, to comply with the provisions of this section would be taken.

One commenter suggested that the proposed requirement that all hazardous conditions be corrected ''immediately'' would diminish safety because miners could be exposed to hazards unnecessarily. The commenter offered as an example an area of bad roof in a ''remote, unused crosscut'' and suggested that in this case posting of the area against entry would be sufficient. MSHA recognizes that there are instances, such as the example presented by the commenter, where safety is best served by simply posting the area against entry. This has long been the practice in the industry and the final rule does not prevent this from continuing. In these cases, the corrective action required to prevent injury is to preclude persons from entering the area. The proposal would have required that the hazardous condition be corrected immediately and that the area remain posted until the hazardous condition is corrected. To reflect the recommendation of the commenter, the final rule requires that the hazardous condition be corrected immediately or that the area remain posted until the hazardous condition is corrected. The Agency recognizes that in some instances posting the area against entry is the corrective action.

The requirement that the hazardous conditions be corrected immediately does not necessarily require correction by the certified examiner finding the condition. To do so could delay the completion of the examination. Rather, the final rule requires that the hazardous condition be corrected following the reporting of the condition by the examiner to the appropriate mine official. Common sense and sound judgement should enter into the decisions as to when hazardous conditions are corrected. Posting of the area where the hazardous condition exists in order to prevent entry is to be accomplished by the certified person finding the hazardous condition.

One commenter questioned whether proposed paragraph (a) would require the hazardous condition itself be posted. The posting of the area, as opposed to the hazardous condition itself, would, in most cases, be more effective and a safer practice. For instance, if a section

of bad roof is detected, it would be in the best interest of safety to mark the area or perimeter of the area of bad roof instead of the roof itself. The ''danger'' sign would be placed at a location where anyone entering the area of the hazardous condition would pass so that persons approaching the area would be expected to see the ''danger'' sign. The area would remain posted until the hazardous conditions are corrected. The posting of areas where hazardous conditions exist to alert persons is a long-standing accepted safety practice in the mining community.

Paragraph (a) requires that once an area is posted due to a hazardous condition, only persons designated by the operator to correct or evaluate the condition may enter the posted area. Additionally, if the hazardous condition creates an imminent danger, everyone must be withdrawn from the affected area to a safe area until the condition is corrected. Persons referred to in section 104(c) of the Act are permitted to enter in the area.

One commenter suggested that the representative of the miners be permitted to enter an area which has been posted with a ''danger'' in order to evaluate the condition. The final rule follows the statutory provision in § 104(c) of the Mine Act. This longstanding requirement provides that only persons designated by the operator to correct or evaluate the hazardous condition may enter such posted areas. With respect to the representative of miners, § 104(c)(3) provides that the representative of the miners in such mine who is, in the judgment of the operator or an authorized representative of the Secretary, qualified to make mine examinations or who is accompanied by such a person and whose presence in such area is necessary for the investigation of the hazardous condition may enter the area.

Paragraph (b) requires that a record of hazardous conditions be made by the end of the shift on which the condition was found. This record is required to be maintained on the surface and must include the nature and location of the hazardous condition and the corrective action taken. A record of all hazards found, as well as the required corrective action, serves as a history of the types of conditions that can be expected in the mine. When the records are properly completed and reviewed, mine management can use them to determine if the same hazardous conditions are recurring and if the corrective action being taken is effective. No record is required on any shift on which no hazardous conditions are found. Paragraph (b) excludes hazardous conditions found during the preshift and weekly examinations because these examinations have separate record keeping requirements.

Commenters recommended rewording the standard to eliminate the provisions that no record is required on any shift on which no hazardous condition is found and that the corrective action taken must also be recorded. These suggestions were offered to clarify the standard. MSHA believes that deleting these requirements would not clarify the rule and the suggestions are not adopted in the final rule.

Paragraph (c) requires that a record be made either by the certified person who conducted the examination or by a person designated by the operator. As with other records required by this subpart, when the record is made by a designated person other than the certified person making the examination, the person making the record need not be certified. If the record is made by a person designated by the operator, the certified person must verify the record by initials and date. MSHA did not receive any comments objecting to this part of the standard. Like the other recordkeeping requirements in the proposal, proposed paragraph (c) would have required that the record be made in a state-approved book or a bound book with sequential machine-numbered pages. Additionally, the proposal would have required countersigning by both the mine foreman and the superintendent or equivalent individual to whom the mine foreman reports. The final rule requires that the records of hazardous conditions must be kept in either secure books that are not susceptible to alteration, or electronically in a computer system so as to be secure and not susceptible to alteration. A detailed discussion of record books and the use of computers to maintain records can be found in the General Discussion of this preamble.

A variety of comments were received regarding the countersigning of the record by the mine foreman, and the time permitted for countersigning. The final rule adopts the proposal that the mine foreman or equivalent mine official must countersign the record of hazardous conditions by the end of the mine foreman's next regularly scheduled working shift. The mine foreman is responsible for the day-to-day operation of the mine. It is essential for the health and safety of the miners that the mine foreman be fully aware of the information contained in this record so as to be able to allocate resources to correct safety problems as they develop. Allowing until the end of the mine foreman's next regularly scheduled working shift to countersign the records assures that the mine foreman is aware of hazardous conditions in sufficient time to initiate corrective actions.

Some commenters suggested that the time for countersigning is unnecessarily long, and that the final rule should require daily countersigning by the mine foreman. The rulemaking record does not show, however, that the time set by the final rule would expose miners to safety or health risks. Also, hazardous conditions must be corrected immediately or the area must remain posted until the condition is corrected.

Numerous comments were received regarding the requirement of the proposal for second level countersigning of the preshift examination record by the mine superintendent, mine manager, or other mine official to whom the mine foreman is directly accountable within 2 scheduled production days after the countersigning by the mine foreman. The final rule does not retain this proposed requirement. A detailed discussion of the subject of second level countersigning can be found in the General Discussion section of this preamble.

As proposed, paragraph (d) of the final rule requires that the records required by § 75.363 be maintained at a surface location at the mine for one year and be made available for inspection by authorized representatives of the Secretary and the representative of miners. Comments on this requirement were generally favorable. A discussion of comments concerning the use of computers to maintain records can be found in the General Discussion of this preamble.

Section 75.364 Weekly Examination

The weekly examination is directed at hazards that develop in the more remote and less frequently visited areas of a mine. These areas include: worked-out areas where pillars have not been removed, bleeder entries used to ventilate worked-out areas where pillars have been removed and, some main intake and return air courses. Over the course of time, hazards such as methane accumulations and obstructions to ventilation can develop in these areas and can result in an explosion or loss of ventilation if not discovered and corrected. Because of the confined nature of the underground mining environment, loss of life can result in other areas of the mine outside the immediate location of the hazard. The weekly examination assures that these hazards are located and corrected.

Generally, § 75.364 requires an examination in unsealed worked-out areas that have not been pillared; travel

in bleeder entries and the performance of appropriate measurements in these entries and; a check for hazardous conditions in return and intake air courses, in each longwall travelway, at each seal along return and bleeder air courses and each seal along intake air courses not otherwise examined, in each escapeway, and each working section that has not been preshift examined during the previous 7 days.

The final rule modifies existing § 75.364 (a), (b), and (h). It adopts several proposed changes to § 75.364 and modifies or rejects other proposed changes.

Paragraph (a) specifies weekly examination requirements in unsealed worked-out areas where no pillars have been recovered as well as in bleeder systems. The final rule requires that unpillared worked-out areas and bleeder systems be physically examined on a weekly basis and specifies the tests and measurements to be performed by the examiner. The final rule identifies two separate locations within nonpillared areas and bleeder systems where measurements may be required. First, measurement points must be included in the mine ventilation plan to identify the locations within unpillared worked-out areas and bleeder systems where examiners will conduct air measurements and tests, the results of which are to be recorded. These measurement points are not in lieu of traveling the system, but rather are the locations where the examiner will perform air quantity and quality tests and measurements to determine the effectiveness of ventilation. These points are tracking and evaluation tools to assure adequate ventilation and to identify developing trends in ventilation or air quality which may require attention.

Second, evaluation points may be approved in the mine ventilation plan on a case-by-case basis as provided under (a)(1) and by (a)(2)(iv). These evaluation points may be used in lieu of physical examinations. Evaluation points may only be approved in lieu of travel if the evaluation points are fully adequate to demonstrate that the area is ventilated. These provisions are discussed below.

The final rule clarifies that measurement points for weekly examinations must be specified in the mine ventilation plan for both unpillared and pillared worked-out areas described in (a)(1) and (a)(2)(iii), respectively. These measurement points are distinct from the evaluation points which may be approved in lieu of a physical examination under some circumstances. As mentioned above, evaluation points are governed by (a)(1) for unpillared worked-out areas, and by (a)(2)(iv) for pillared worked-out areas ventilated by bleeder systems. Section 75.371(z) of the final rule refers to these requirements for both measurement points and evaluation points. The measurement points and evaluation points may be either in the body of the mine ventilation plan or may be shown on the 75.372 map. In either case, the locations are subject to approval by MSHA.

Under paragraph (a)(1), at least every 7 days a certified person must examine unsealed worked-out areas where no pillars have been recovered by traveling to the area of deepest penetration; measuring methane and oxygen concentrations and air quantities and making tests to determine if the air is moving in its proper direction in the areas. The locations of measurement points where tests and measurements will be performed must be included in the mine ventilation plan and must be adequate in number and location to assure ventilation and air quality in the area. Air quantity measurements must be made where the air enters and leaves the worked-out areas. Sufficient methane and oxygen measurements must be made to assure the air quality in the worked-out areas. An alternative method of evaluating the ventilation of the areas may be approved in the mine ventilation plan.

Under paragraph (a)(1), in addition to measuring oxygen and methane concentrations and testing for proper air direction, air quantities must also be determined. Air quantity measurements are required where air enters and leaves the worked-out area. The final rule also requires that a sufficient number of measurement points must be included in the mine ventilation plan to assure appropriate ventilation and air quality in the area.

The changes to paragraph (a)(1) are in response to comments and MSHA experience with weekly examinations. Currently some examiners are simply traveling to the point of deepest penetration while conducting few if any tests or air measurements within the system. The full benefit of an examiner traveling to the point of deepest penetration is lost if the examiner does not conduct air quantity and quality measurements at key locations.

The results of these measurements are important in assessing the effectiveness of ventilation. In addition, trends in either air quantity or quality can reveal developing problems which can be corrected in the earliest stages.

One commenter suggested that the entire perimeter of worked-out areas should be physically examined to all points of deepest penetration. The commenter suggested that the face of each entry or room should be examined at its point of deepest penetration. MSHA agrees that travel to a single point of deepest penetration within an area may sometimes be inadequate to fully demonstrate effective ventilation of a worked-out area. The final rule addresses this issue by requiring that measurement points be established in the mine ventilation plan.

Paragraphs (a)(2) (i) through (iv) of the final rule retain the requirement that at least every 7 days a certified person must evaluate the effectiveness of bleeder systems used under § 75.334 (b) and (c). Like the proposal, the final rule also specifies tests and locations for an effective examination. One commenter noted that mine examinations are sometimes ineffective and supported the proposed additional specificity in the rule, requiring air measurements and tests at key locations or measurement points within worked-out areas. Established locations where examiners will conduct air measurement and tests will help assure effective examinations and provide quantitative results to the operator. The final rule requires that the mine ventilation plan include measurement points within worked-out areas and paragraph (h) requires that the results be recorded.

Paragraph (a)(2)(ii) requires that measurements of methane and oxygen concentrations be made, air quantity be measured, and a test performed to determine if the air is moving in its proper direction at a point immediately before the air enters a return split of air. A commenter supported the proposed air measurements where air enters and leaves worked-out areas and correctly noted that such measurements would reveal some types of ventilation problems. In a special case, such as where it may not be possible to measure intake air, paragraph (a)(2)(iv) permits an alternate method of evaluation to be used when approved in the mine's ventilation plan.

Another potential hazard exists when multiple intake openings lead into such an area, if passing intake air enters upstream openings of the worked-out area and reenters the intake from downstream openings. The final rule also requires that air quantity measurements be made where air enters and leaves worked-out areas. Measurements made where air enters and exits the area will alert the examiner and operator to airflow changes or imbalances which indicate a potentially dangerous ventilation problem. The specification of

measurement points within worked-out areas will also assure that short circuits have not interrupted ventilation.

One commenter stated that the standard should fully delineate all aspects of the weekly examination by specifying that the examination include roof and ribs, ventilation controls, water accumulations, etc. Although MSHA agrees that these and other conditions fall within the purview of the weekly examination, the final rule does not attempt to provide an exhaustive list of what is to be covered in a weekly examination. Examinations are performed by persons trained and certified as able to make the required examinations. Such certified persons can be expected to give proper attention to basic safety considerations.

Paragraph (a)(2)(iii) requires that at least one entry of each set of bleeder entries used as part of a bleeder system under § 75.334 must be traveled in its entirety. Under the final rule, measurements of methane and oxygen concentrations and air quantities are required to be made during the examination. Also, a test to determine if the air is moving in its proper direction must be made at locations or measurement points, specified in the mine's ventilation plan. The measurements and tests provide the information necessary to determine the effectiveness of the bleeder system.

One commenter believed that the proposal would require each parallel and common bleeder entry of a set to be traveled. The final rule is intended to simplify the examination and would, under the circumstances described by the commenter, require only one entry of a set of common entries to be examined in a bleeder system. Also, similar to the requirements for traveling intake and return air courses, this requirement should not be interpreted to require the examiner to stay in one entry. For example, if the examiner desires to ''zig zag'' between entries while traveling in a multi-entry bleeder system, this would be acceptable under the regulation provided tests and measurements are made at the appropriate locations.

Paragraph (a)(2)(iv) provides that, in lieu of the requirements of (i) through (iii), alternative methods of evaluation may be specified in the mine ventilation plan provided that the alternative method results in proper evaluation of the effectiveness of the bleeder system. One commenter cited several explosions that were related to bleeder system deficiencies and linked poor design and inadequate maintenance with the provision allowing examination at evaluation points in lieu of traveling the area in its entirety. The thrust of the commenter's argument was that an inflexible standard requiring either full travel of a bleeder system or sealing of the entire area would result in superior designs and improved maintenance. While MSHA agrees with the commenter's ultimate objective of ensuring effective ventilation of bleeder systems and worked-out areas, MSHA does not agree that elimination of any flexibility within the standard would result in infallible designs. Since approval of evaluation points is only granted in cases where adequate ventilation can be determined through evaluation, MSHA believes that retaining flexibility to review individual cases is an appropriate method and results in proper evaluation of the effectiveness of the bleeder system.

Paragraph (h) of the final rule governs recordkeeping requirements for weekly examinations. The final rule incorporates several revisions based on recommendations submitted by commenters. The final rule requires that at the completion of any shift during which a portion of a weekly examination is conducted, a record of the results be made. This record must include any hazardous conditions found during the examination and their locations, the corrective actions taken, and the results and location of air and methane measurements. The record must be made by the person making the weekly examination or a person designated by the operator.

The final rule includes a revision requiring that the results of methane tests must be recorded as the percentage of methane measured by the examiner. Previously, terms such as ''ok,'' ''low,'' or ''trace'' were entered in record books as test results. The final rule clarifies that such qualitative terms are not acceptable when examination requirements specify the measurement of air quantity or methane levels as such entries provide little useful information.

The final rule requires that if the record is made by a person other than the examiner, the examiner must verify the record by initials and date by or at the end of the shift for which the examination was made. As with other records required by this rule, the records of weekly examinations may be kept either in secure books that are not susceptible to alteration, or electronically in a computer system so as to be secure and not susceptible to alteration. A detailed discussion of record books and the use of computers to maintain records can be found in the General Discussion of this preamble.

Commenters suggested that the final rule only require the examiner to record uncorrected hazardous conditions. MSHA is sensitive to minimizing recordkeeping requirements and, for example, the final rule requires only uncorrected defects found during the fan examination to be recorded. However, the weekly examination record serves as a history of the types of conditions that can be expected in the mine. When the records are properly completed and reviewed, management can use them to determine if the same hazardous conditions are occurring and if the corrective action being taken is effective. Additionally, this record can permit mine management, the representative of the Secretary, and the representative of miners to better focus their attention during examinations and inspections. The final rule adopts the proposal and requires the examiner to record all hazardous conditions found and the action taken to correct the hazardous condition.

A variety of comments were received regarding the countersigning of the records of weekly examinations by the mine foreman, and the time permitted for countersigning. The final rule adopts the proposal that the mine foreman or equivalent mine official must countersign the record of the weekly examination by the end of the mine foreman's next regularly scheduled working shift. The mine foreman is in a key position of responsibility relative to the day-to-day operation of the mine. It is essential for the health and safety of the miners that the mine foreman be fully aware of the information contained in the preshift examination reports so as to be able to allocate resources to correct safety problems as they develop. Allowing until the end of the mine foreman's next regularly scheduled working shift to countersign the reports assures that the mine foreman is aware of the results on a regular and timely basis.

Numerous comments were received regarding the requirement of the proposal for second level countersigning of the weekly examination record by the mine superintendent, mine manager, or other mine official to whom the mine foreman is directly accountable. A full discussion of second level countersigning can be found in the General Discussion section of this preamble.

Paragraph (h) of the final rule also contains revisions to the existing rule to allow for electronic storage of records. Paragraph (i) requires that the records required by § 75.364 be maintained at a surface location at the mine for one year and be made available for inspection by authorized representatives of the Secretary and the representatives of

miners. A discussion of comments concerning the use of computers to maintain records can be found in the General Discussion of this preamble.

Under the final rule, the record of weekly examinations must be countersigned by the mine foreman or equivalent mine official by the end of the mine foreman's next regularly scheduled working shift. Based on comments noting that traditional mine management structures have changes at some operations, the final rule provides that an official equivalent to mine foreman may countersign the records. The purpose of this change is to require that when a mine foreman is not present in the mine's management structure, an equivalent official must perform this function. As with the existing standard, second level countersigning by the mine superintendent is not required by the final rule.

The record of weekly examinations must be made in secure media not susceptible to alteration. If records are made electronically, they must be unalterable, shall capture dates and signatures, must be accessible to representatives of the miners and the Secretary, and must be capable of producing printouts. Further discussion of both the issues of second level countersigning and acceptable record books or electronic records can be found in the general discussion section of this preamble.

The proposal, at paragraph (b), would have added a requirement that the certified person examine for noncompliance with mandatory safety or health standards that could result in a hazardous condition. The proposal drew considerable objection. Commenters objected to the unlimited scope of the term ''noncompliance,'' the legal propriety of recording noncompliance, and the additional examination time required to determine noncompliance, the diversion of the examiner's attention away from key safety conditions to minor compliance issues. Even so, another commenter supported the proposal as necessary, suggesting that the earlier rule was intended to require operators to assure full compliance through the required examinations. The commenter correctly noted that a requirement to examine for safety and health violations was in effect from 1970 until 1992 when it was deleted.

While the proposed standard appeared attractive in concept, the majority of comments received indicate that the standard would result in considerable confusion. In addition, it would be impractical to define and adequately limit the scope of the requirement. Comments consistently indicated confusion and misinterpretation of the proposal's scope, offering a wide range of interpretations.

As discussed in the preamble to the 1992 rule, most hazards are violations of mandatory standards. Requiring the examiner to look for all violations regardless of whether they involve a distinct hazard could distract the examiner from the more important aspects of the examination. Despite an attempt in the proposal to limit the scope of the examination for noncompliance to situations that, ''could result in a hazardous condition,'' commenters expressed a high level of misunderstanding. Although a similar requirement existed between 1970 and 1992, MSHA generally did not broadly apply the standard. After consideration of all comments and a review of the history since the current standard became effective, MSHA concludes that the existing standard is appropriate and best serves the objective of giving examiners clear guidance for making effective examinations. Accordingly, the proposal for examinations to include noncompliance with mandatory safety and health standards is not adopted in the final rule.

Paragraph (b)(7) has been added to require that water pumps not examined as part of a preshift examination conducted during the previous 7 days be examined during the weekly examination. This modification is an outgrowth of comments received in response to proposed § 75.360, which would have required examination of certain pumps. As discussed in the preamble to § 75.360, one commenter persuasively argued that all pumps should be examined. Pumps that are not preshift examined under the final rule are generally located in remote areas of the mine. These pumps are appropriately examined on a weekly basis.

Section 75.370 Mine Ventilation Plan; Submission and Approval

Mine ventilation plans are a long recognized means for addressing safety and health issues that are mine specific. Individually tailored plans, with a nucleus of commonly accepted practices, are an effective method of regulating such complex matters as mine ventilation and roof control. Section 75.370 requires that each mine operator develop and follow a ventilation plan that is approved by MSHA and that is designed to control methane and respirable dust in the mine. Section 75.370 further requires that the plan be suitable to the conditions and mining system at the mine. In addition, § 75.370 provides the procedures for submittal, review and approval of the plan to assure that the plan for each mine will address the conditions in that mine.

In this final rule, MSHA revises the existing plan submission and approval process to provide an increased role for the representative of miners in the mine ventilation plan approval process. This revision is consistent with the statutory purpose that miners play a role in safety and health.

The final rule redesignates existing paragraphs (b)(1) through (f) as (c)(1) through (g), revises paragraphs (a)(3), (c)(1), and (f), and adds a new paragraph (b). The proposal would have modified the existing rule by providing that the representative of miners would receive a copy of the proposed mine ventilation plan or proposed revisions at the time of submittal to MSHA, and the approved plan upon approval by MSHA. The existing rule provided that the submitted plan and the approved plan were to be made available to the miners representative. Another proposed change was to specify the length of time the submitted plan and the approved plan would be posted at the mine. A new paragraph (b) would allow for timely comments on the submitted plan from the miners representative. Representatives of miners would receive written notice of plan approval. The final rule, for the most part, adopts the proposed rule. However, the final rule requires that the miners representative be notified of the submittal of a mine ventilation plan and revisions to a plan 5 working days prior to submittal and that the representative of miners be provided with a copy of the plan upon request. It also requires that MSHA provide a copy of miners'' representative comments to the mine operator upon request.

Final rule paragraph (a)(3) is divided into (a)(3)(i), (a)(3)(ii), and (a)(3)(iii) and contains new requirements in (a)(1)(i) and (a)(1)(iii). Paragraph (a)(3)(i) requires that the mine operator notify the representative of miners that a mine ventilation plan or a plan revision is to be submitted to the District Manager for approval. This notification must be given at least 5 days prior to submission. Paragraph (a)(3)(i) further requires that the operator provide a copy of the plan or revision to the representative of miners at the time of notification, if requested. Paragraph (a)(3)(ii) requires that the proposed plan be made available for review by the representative of miners, and paragraph (a)(3)(iii) requires that the proposed plan or revision be posted on the

bulletin board at the mine and remain posted until it is approved, withdrawn, or denied.

Commenters representing both operators and labor suggested that the proposed plan or revision should be provided to the representative of miners prior to being submitted to the district manager for approval. One commenter suggested that the proposed plan or revision be provided to the representative of miners 10 days prior to submittal and stated that this could speed up the approval process by allowing the miners affected to investigate the proposed change and by permitting the operator and the representative of miners the opportunity to reconcile differences prior to the operator's seeking approval. The commenter pointed out that some existing wage agreements have adopted such a requirement. The commenter suggested that the rule should also include such a requirement because operators do not always comply with the requirements of the agreement. This commenter further suggested that there have been instances where plans have been revised and acted upon before the representative of miners was aware that a revision was to be made. Other commenters suggested that the proposed plan or revision be provided 3 days prior to submittal. These commenters expressed different reasons for the suggestion. One of these commenters stated that the industry has historically maintained that since the plan is submitted to the district manager for approval, and developed by the mine operator, the requirement to provide copies to other parties is contrary to the Mine Act. However, the commenters further stated that their suggestion reflected an attempt to balance all interests and resolve this matter.

These comments are constructive and MSHA has used all of them to fashion a final rule which is consistent with the statutory purpose and responsive to the mining community. One commenter attempted to relate the rule to terms of a wage and hour agreement. MSHA does not intend or have authority to affect any wage and hour agreement. MSHA believes that the involvement of the miners and their representative in the plan approval process will improve the health and safety of the Nation's coal miners. As suggested by commenters, miners who work under the mine ventilation plan are often in the best position to know the effect of proposed revisions. MSHA has long recognized the importance of input from the miners and their representatives in the plan-approval process. The preamble to the existing standard discusses the role of miners and their representatives in the development of mine ventilation plans in detail. MSHA continues to believe that miners have a stake in the implementation of the ventilation plan at each mine.

The final rule is consistent with the existing plan approval process and does not change the process for developing and approving a mine ventilation plan. The operator continues to be the party responsible for developing the mine ventilation plan and MSHA continues to be responsible for reviewing and approving the plan. The proposed rule, in paragraph (a)(3)(i), would have required the operator to provide a copy of a proposed mine ventilation plan or any proposed revision to the representative of miners at the time of submittal to MSHA. The final rule requires the operator to notify the representative of miners of the submittal of the proposed plan or revision at least 5 working days prior to submittal to the district manager. In addition, a copy is to be provided to the representative of miners upon request. In most instances, this should provide sufficient time for a review of the proposed plan or revision and a discussion between the operator and the representative of miners over concerns that may exist.

In response to comments, paragraph (a)(3)(i) is further revised in the final rule to reflect that there are occasions when mine ventilation plans must be submitted and reviewed within a very short time frame. In response to a question during one of the public hearings on the proposed rule, one commenter stated that miners understand that at times situations may arise that necessitate an operator submitting a plan or revision to MSHA that will not allow for the ten (10) day provision for the representative of the miners.

Paragraph (a)(3)(i) of the final rule requires that in the case of a situation requiring immediate action on a plan revision, notification of the revision shall be given, and if requested, a copy of the revision shall be provided to the representative of miners by the operator, at the time of submittal to the district manager. The final rule does not include the recommendation of one commenter that the plan or revision be provided to the representative of miners before submittal because to so require could delay approval of a change necessary to health and safety. Questions will undoubtedly arise relative to what constitutes a situation requiring expedited action. MSHA does not believe that it is possible or appropriate to set forth all circumstances which would be covered by the standard. Should such a situation arise, it would be handled by the district manager on a case by case basis. Generally, the district manager would be guided by whether the condition, if uncorrected, could result in a health or safety hazard or an imminent stoppage of production in the mine or an area of the mine.

Paragraph (a)(3)(ii) of the final rule retains the requirement that a copy of the proposed plan or any proposed revisions be made available for inspection by the representative of the miners. Although some commenters thought this was superfluous in light of the requirement in paragraph (a)(3)(i), MSHA believes that this requirement facilitates the overall approval process.

Paragraph (a)(3)(iii) of the final rule retains the existing requirement that copies of the proposed plan and proposed revisions be posted on the mine bulletin board and clarifies that posting is required at the time of submittal. MSHA believes that the posting requirement is necessary to assure that all miners at a mine will have the opportunity to review the proposed plan or revision and provide input during the review process. One commenter suggested that proposed plans or proposed revisions be required to remain posted for only 30 days from the time of submittal so as not to ''clutter up the bulletin board.'' This suggestion has not been included in the final rule because the mine ventilation plan impacts miners'' safety and health and it is important for miners to know which plan provisions are in effect versus those which have not been approved. Another commenter suggested that proposed plans and revisions be posted 10 days prior to submittal to MSHA. This recommendation has not been included in the final rule to assure that there is no confusion between plans that are approved and proposed provisions awaiting MSHA approval. To require posting of proposed plan revisions prior to submission to MSHA would create another category of mine ventilation plans which could result in unnecessary confusion. This is particularly true since the representative of miners will have the plan at least 5 days prior to submittal. Because there are occasions where a representative of miners does not feel it is necessary to review a plan or revision, the rule only requires the operator to provide a copy of the plan or revision upon request.

Paragraph (b) of the final rule specifies procedures that the representative of miners may use to provide input in the mine ventilation plan review process. Under the final rule, the representative of miners may

submit comments on the proposed plan or revisions to the plan to the district manager for consideration. Recognizing that in some instances a decision relative to the approval or denial of a revision must be made in a short time frame, the final rule requires that comments be made in a ''timely manner.'' MSHA has not defined ''timely manner'' but would consider it to be a period of time that does not unnecessarily delay the approval process. The district manager will continue to be available to discuss with the representative of miners all aspects of the plan as they affect miners' health and safety at any time during or following approval or denial of a proposed plan or revision. Commenters suggested that the representative of miners be given a deadline for the submission of comments similar to the time frame established in paragraph (a)(3)(i) for the operator to provide copies of proposed plans and revisions to the representative of mines. In support of this recommendation, these commenters stated that unlimited time could unnecessarily delay the approval process. This recommendation is not included in the final rule due to the complexity of some plans and revisions. MSHA's goals are for a process that includes both timely review and approval and opportunity for input from miners and the Agency believes both goals can be accomplished under the final rule. MSHA does not believe that this provision will unnecessarily delay the plan approval process since the final rule, like the proposal, requires comments to be submitted in a timely manner.

One commenter suggested that comments submitted by the representative of miners to the district manager as part of the plan approval process should be provided to the operator. MSHA would expect that during the five day period before the plan is submitted to the district manager the operator and the representative of miners will discuss the plan and inform the other of their respective positions. MSHA would encourage the representative of miners to provide a copy of their comments to the operator prior to submitting them to MSHA. However, to assure that all parties to the plan approval process are aware of each others position paragraph (b) of the rule provides that the district manager will provide the operator with these comments upon request.

Paragraph (c)(1) of the final rule is unchanged from the proposal and retains the existing requirement that the district manager notify the operator in writing of the approval or denial of a proposed plan or proposed revision. Paragraph (c)(1) adds a requirement that a copy of this notification be sent by the district manager to the representative of miners. This provision is intended to assure that the representative of miners is kept informed of the status of the plan approval. One commenter pointed out that quite often, plan provisions are modified during the review process and the final approved plan may be different from that which was originally submitted. This commenter suggested that when a change is made to a submission, the representative of miners should be notified of the intended change and afforded the opportunity to comment. MSHA agrees that changes to proposed plans do occur during the review process. Consistent with MSHA's philosophy that all parties to the plan approval process need to be aware of the status of a proposed plan or revision, MSHA would expect that the operator would inform the representative of miners of changes to the original submittal. However, to require that notification be provided for each and every change, no matter how minor, could effectively stop the plan review and approval process. Therefore, the final rule does not adopt the suggestion of the commenter. Some commenters interpreted paragraph (c)(1) as requiring the district manager to provide a copy of the approved plan to the representative of miners. Paragraph (c)(1) only requires that the district manager provide to the representative of miners a copy of the notification of approval or denial that is sent to the operator.

Proposed paragraphs (f)(1), (f)(2) and (f)(3) are adopted in the final rule. Paragraph (f)(1) is new and requires the operator to provide the representative of miners with a copy of the plan or revision following notification of approval, if requested. This facilitates review of the plan or revision by the representative of miners. Also, the final rule continues in paragraphs (f)(2) and (f)(3) the existing requirements that the approved plan or revision be made available for inspection by the representative of miners and be posted on the mine bulletin board. Like the proposal, a new requirement in paragraph (f)(3) also requires that an approved plan or revision must be posted within 1 working day of notification of the approval and must remain posted for the period that the plan is in effect. This helps to assure that the miners themselves, as well as the representative of miners, are aware of the provisions of the mine ventilation plan once it is approved.

Commenters both supported and opposed paragraph (f). Those in opposition suggested that some of the requirements were unnecessary in light of other requirements in the standard. Those supporting the rule suggested that the operator should be required to provide a copy of the approved plan or revision to the representative of miners and to make it available within 24 hours of notification of approval. Other commenters stated that mine ventilation plan approvals are sometimes sent to the company offices and not necessarily to the mine. They stated that in these cases, there could be a delay in copies of the approved plan or revision reaching the mine. MSHA crafted the final rule in light of the existing paragraph (d) which requires that operators instruct persons affected by the mine ventilation plan or its revision prior to implementation. Changes to the plan do occur during the approval process; MSHA would expect that the plan or revision would be available to the person conducting the required training and, therefore, would be provided to the representative of miners.

One commenter suggested that, because the approved plan is required to be made available for inspection by the representative of miners, there is no need for the plan or revision to be posted on the bulletin board. This commenter identified some logistical problems associated with posting of plans stating that removal of the plan from the bulletin board could be a problem.

This same commenter proposed that notification of the miners of a revision to the mine ventilation plan should be the responsibility of the representative of miners. MSHA does not agree that making the plan available for inspection by the representative of miners is an adequate substitute for posting of the plan or revision so as to make it available to all miners at all times. Nor does MSHA agree that the responsibility for assuring that miners are aware of the requirements of the plan is the proper function for the representative of miners. MSHA recognizes that difficulties can exist in assuring that the approved plan or revision is posted, however the safety benefits of having the plan available to the persons affected by its provisions far outweigh any logistical problems.

Section 75.371 Mine Ventilation Plan; Contents

Section 75.371 sets forth the information that the operator must include in the mine ventilation plan. Because the plan deals with situations

unique to a mine, the general rules applicable in other standards do not fit. For the convenience of the reader, the standard that sets out the general rule or provides for an option to include a provision in a plan will generally cross reference to the appropriate paragraph in § 75.371.

MSHA proposed revisions to existing paragraphs (b), (s), (z) and (bb) of § 75.371 and reproposed existing paragraph (r). MSHA's final rule adopts the proposal for paragraphs (s), (z) and (bb). MSHA revises its proposed paragraph (r) to make conforming changes with other provisions. Finally, the final rule retains the existing language for paragraph (b).

As stated in the General Discussion section of this preamble, provisions concerning the installation and removal of mechanized mining equipment that were promulgated in May of 1992 as part of the safety standards for underground coal mine ventilation were reproposed in May of 1994 as part of this rulemaking for the purpose of receiving and giving full consideration to all pertinent comments on this issue. Paragraph (r) of the final rule is one of the provisions that was reproposed. Section 75.325(d) of the final rule requires that areas where mechanized mining equipment, including longwall equipment, is being installed and removed be ventilated. Paragraph (r) of § 75.371 requires that the quantity of air that will be provided be included in the mine ventilation plan. Most commenters either supported the provision, citing the explosion at the William Station Mine, or stated that the standard was originally promulgated inappropriately and did not substantively comment on the requirement. One commenter suggested that the quantity of air specified in the plan under paragraph (r) should represent the minimum quantity that will be provided and the location specified should be identified as what would be typical so as to give the mine the flexibility to adapt to varying mine conditions. This recommendation is consistent with MSHA's intent and MSHA has included it in the final rule to help clarify the rule.

One commenter suggested that the ventilation scheme shown in the plan should be representative of the method of ventilation to be used. MSHA agrees that the mine ventilation plan should include a method of ventilation that is representative of that used in the mine. However, MSHA has not adopted this suggestion since the plan must be specific enough so that the operator, the miners, the representative of miners, and MSHA are assured that all areas are being adequately ventilated.

Paragraph (r) of the final rule requires that the mine ventilation plan include the location where air quantities will be provided, and the ventilation controls that will be used to provide these quantities. This language was included in the reproposed provision and in § 75.325(d), which requires that the quantity of air that will be provided during the installation and removal of mechanized mining equipment, the location where this quantity will be provided, and the ventilation controls that will be used, be included in the mine ventilation plan. In reproposing paragraph (r), MSHA inadvertently excluded from § 75.371(r) the requirement relative to the location where the air quantity is provided. The final rule has been modified in § 75.371(r) to conform to the requirements of § 75.325(d).

The final rule revises existing paragraph (s) to conform to changes in § 75.362(d)(1)(iii). The final rule deletes the portion of existing § 75.362(d)(2) which requires that the mine ventilation plan include the location of tests which are to be made closer to the working face than the last permanent roof supports using extendable probes or other acceptable means. The final rule in paragraph (d)(1)(iii) requires that the mine ventilation plan specify the frequency and location of the methane tests if required more often than 20 minutes by § 75.362(d)(1)(iii). One commenter suggested adding the words, ''or at other locations and frequencies if approved by the district manager and contained in the ventilation plan.'' The suggested clarification is not necessary and has not been adopted in the final rule.

The final rule revises paragraph (z) to conform to § 75.364(a). Section 75.364(a) addresses the measurements to be made to evaluate the effectiveness of bleeder systems and the ventilation of worked-out areas during the weekly examination. The final rule requires that the locations where these measurements are made or alternative methods of providing these evaluations be included in the mine ventilation plan. One commenter suggested that the locations where air measurements are made should not be required in the mine ventilation plan. The commenter made a similar suggestion relative to the requirement in § 75.364 that air measurements be made to evaluate the ventilation of worked-out areas and determine the effectiveness of bleeder systems. According to the commenter, since no specific air volume is required it is not necessary to measure the volume present. The measurement of air quantity, as well as the other measurements required by the existing standard, are essential to evaluate the ventilation of worked-out areas and determine the effectiveness of bleeder systems. The final rule, therefore, does not include the suggested changes in either § 75.364 or § 75.371(z).

Another commenter suggested that since the current standards do not require a specific volume of air in bleeder entries, it is unnecessary to measure the air volume. Proper evaluation of the effectiveness of a bleeder system can only be achieved by comparison of measurements taken in the bleeder system. In most instances, one of the most important measurements is the air quantity at strategic points in the bleeder system. Therefore, the final rule includes the proposed requirement that the locations where air quantity measurements will be made in the bleeder system be specified in the mine ventilation plan.

Existing paragraph (bb) requires that the location of ventilating devices used to control air movement through worked-out areas be included in the mine ventilation plan. The final rule reinstates a requirement contained in the previous regulation, that the location and sequence of construction of proposed seals also be indicated. This requirement is consistent with § 75.334(e) which requires that the sequence of construction of seals be specified in the mine ventilation plan. Some commenters on paragraph (bb) and § 75.334(e) suggested that proper sequencing of seals can change due to mining conditions and should not be made a part of the mine ventilation plan. Another commenter suggested that because the time to get a plan approved can be lengthy, it may even create unnecessary hazards. Proper sequencing of seal construction is necessary for effective ventilation during sealing. Therefore, the final rule requires the location and sequence of the construction of seals be specified and approved in the mine ventilation plan. If a delay in seal construction will result in a hazard to miners, the review and approval of the plan can be expedited as explained in the preamble discussion of § 75.370.

One commenter on paragraph (bb) suggested that the locations of stoppings, regulators, and bleeder connector entries are better shown on the mine map with a notation that it is subject to approval under § 75.371. The existing standard permits appropriate information required under § 75.371 to be shown on the map required by § 75.372. This is explained in the preamble discussion for existing § 75.371. MSHA recognizes that some of

the information required to be submitted under § 75.371 is best shown on a map. Rather than require additional maps, this information may be shown on the § 75.372 map. When shown on the § 75.372 map, only that portion of the map that contains information required under § 75.371 is subject to approval by the district manager.

The proposal would have revised paragraph (b) to reflect the proposed changes in paragraphs (c) and (d) of § 75.312 allowing alternative testing methods for main mine fan automatic closing doors and fan signals. Because the final rule does not include the proposed changes to § 75.312(c) and (d), final rule § 75.371(b) conforms.

Section 75.372 Mine Ventilation Map

The mine ventilation map provides a basis for understanding how a particular coal mine is ventilated. An accurate and up to date map of the mine enables the operator and MSHA to review the mine's ventilation plan to determine the appropriateness of the ventilation system to the conditions in the mine. Only through a thorough understanding of the ventilation system can the operator and others determine whether the system is capable of preventing methane accumulations, possible explosions, and high levels of respirable dust. Generally, § 75.372 requires that the necessary information be provided on the map.

The final rule revises existing paragraph (b)(3) and adds new paragraphs (b)(19) and (b)(20). Paragraph (b)(3) addresses which adjacent workings must be shown on the mine map. The final rule, like the proposal, requires all known adjacent workings within 1,000 feet of existing or projected mine workings to be shown on the mine map, regardless of whether the workings are located on mine property or on adjacent property. The existing rule required that only the adjacent workings within 1,000 feet be shown if they are on mine property.

MSHA has concluded that it is necessary to require that the mine ventilation map include all known workings located in the same coalbed within 1,000 feet of existing or projected workings, regardless of whether the workings are located on the mine property. Hazards, such as methane and water accumulations and irrespirable atmospheres, exist in old workings whether located on mine property or not. MSHA also notes that this revision makes paragraph (b)(3) consistent with existing paragraph (h) of § 75.1200, Mine map. Paragraph (h) of § 75.1200 requires that the mine map show all adjacent mine workings within 1,000 feet. Like the previous standard, this revision would assure that all adjacent mine workings appear on the § 75.372 map in those cases where operators do not use a § 75.1200 map for their required submission.

One commenter suggested that this requirement not be included because mine operators have no legal obligation or authority to force an adjacent land owner to provide the required information. MSHA recognizes that the mine operator may, in some instances, have difficulty obtaining this information. The hazards that exist within abandoned mines, however, warrant such a requirement. Additionally, as noted previously, this requirement is consistent with the requirements of § 75.1200(h) and will, therefore, impose no additional burden on the operator. Agency experience reveals that the existing standard, § 75.1200(h), has not proven to be practically difficult for compliance. In addition, this information would be available to the miners and would enhance their understanding of the ventilation system and aid them in the event of an emergency.

Another commenter suggested that the rule explicitly require that all mine workings, including workings from auger mining, highwall mining and strip mining, be shown on the map. This recommendation has not been included in the final rule because MSHA believes that the final rule is clear and requires any workings from other mines, such as strip, auger and similar workings, to be shown if they are in the same coalbed and are within 1,000 feet of existing or projected mine workings.

Proposed paragraph (b)(19) is adopted in the final rule. The proposal was drafted in response to comments received at public meetings. It reinstates the requirement in the previous standard that the mine map include the entry height, velocity and direction of the air current at or near the midpoint of each belt flight where the height and width of the entry are representative of the belt haulage entry. Paragraph (b)(19) of the final rule should assist the examiner in rapidly determining whether the air is flowing in its normal velocity and direction during examination of the belt entry required elsewhere in subpart D. One commenter suggested that this requirement is redundant because the mine ventilation plan already requires that this be ''illustrated''. MSHA does not agree that the requirement is redundant since there is no such requirement in the mine ventilation plan.

MSHA emphasizes that like much of the information required to be shown on the ventilation map, this information would not be subject to approval. When shown on the § 75.372 map, only that portion of the map that contains information required under § 75.371 is subject to approval by the district manager. The information required by paragraph (b)(19) does not fit this criteria and therefore is not subject to approval by the district manager.

As explained in the discussion of § 75.301, instances have developed where operators direct air from an intake air course to ventilate shops, electrical installations, or for other purposes, and this air is then coursed to the surface and is not used to ventilate working places. Under one interpretation of the existing definition, because this air has not ventilated a working place or a worked-out area, the air course cannot be considered a return air course. In these instances, the final rule in § 75.301 expressly permits the redesignation of the affected portion of the air course as a return air course. Because it is important that personnel, including examiners, the miners' representative, and representatives of the Secretary, know which air courses have been redesignated, the final rule requires that these air courses be shown on the map. Paragraph (b)(20) requires that the location of redesignated air courses be shown on the ventilation map. Commenters were supportive of this provision.

Section 75.380 Escapeways; Bituminous and Lignite Mines

When a fire, explosion or other emergency necessitates an immediate evacuation of a mine, the designated route for miners to leave the mine is the escapeway. The escapeway should be appropriately located and designed to be free of obstructions and hazards to assure safe passage from the hazardous underground environment. The final rule addresses requirements for escapeways. Paragraphs (b)(1) and (b)(2) set forth the requirements for the location of the escapeway when installing and removing mechanized mining equipment. Paragraphs (d)(3) through (d)(5) deal with the minimum dimensions of escapeways. Paragraph (f) addresses the equipment that can be used in escapeways and the requirements for fire suppression systems on this equipment. Finally, paragraph (i) sets the minimum slope of an escapeway.

The final rule republishes existing paragraphs (b)(1) and (b)(2) and revises paragraph (d)(3) through (d)(5), (f) and (i)(2).

Sections 75.380 (b)(1) and (b)(2) of the final rule deal with escapeways on

working sections and areas where mechanized mining equipment is being installed or removed. MSHA adopts the proposal in the final rule. An in-depth discussion of the proposal of provisions concerning the installation and removal of mechanized mining equipment is presented in the General Discussion section of this preamble.

MSHA specifically solicited comments on those portions of the proposal dealing with the installation and removal of mechanized mining equipment, including paragraphs (b)(1) and (b)(2) of § 75.380. These paragraphs require that an escapeway be provided to areas where mechanized mining equipment is being installed or removed. Only one substantive comment was received. The commenter suggested that the location of the beginning of the escapeway during equipment installation and removal should be specified in the mine ventilation plan to minimize the potential for congestion during movement of heavy equipment. The commenter stated that the proposal would eliminate all access to a longwall during the installation or removal of the longwall equipment except for the face crosscut, and lead to accidents.

MSHA believes that the location where the loading point will be installed and where the loading point was last located prior to removal are easily identifiable and offer the best choice. The suggestion of the commenter has not been adopted in the final rule. In addition, the commenter noted that mobile equipment was needed during the installation and removal of longwalls; this equipment can be used in the escapeway if properly attended and protected with proper fire suppression.

As with the existing rule, paragraph (d)(3) of the final rule generally requires escapeways to be maintained to a height of 5 feet from the mine floor to the mine roof, excluding the thickness of any roof support. To accommodate mines in low seams, the rule provides that where the coalbed is less than 5 feet, the escapeways shall be maintained at least to the height of the coalbed. As in the past, convergence, the reduction in entry height due to roof sag or floor heave, which occurs as a natural geologic process, will be excluded when determining escapeway height unless it would impede the escape of miners, including disabled persons, in the event of an emergency. The final rule modifies (d)(3) to provide that in areas of mines where escapeways pass through doors or in areas of mines developed before November 16, 1992 where escapeways pass across or under overcasts or undercasts, the height of the escapeway may be less than 5 feet provided the height is sufficient to enable miners, including disabled persons, to escape quickly in an emergency. It was brought to the attention of MSHA by one commenter that in some instances the removal of roof support or the lowering of the tops of overcasts may be necessary to provide the 5-foot height required by the existing rule. It has been suggested that this could result in a diminution of safety.

One commenter suggested that escapeways should be 6 feet in width and 5 feet in height without exception. This suggestion has not been adopted in the final rule. Under the previous rule, escapeway dimensions were addressed through criteria and operators routinely requested and received approval for lesser dimensions than that in criteria based on a performance test referred to as a ''stretcher test.'' As applied, this test required 4 persons to carry a fifth person on a stretcher through the area in question. The purpose of the ''stretcher test'' was to demonstrate that the lesser dimension would not delay escape. The final rule permits lesser escapeway heights and widths under specific circumstances provided the height and width maintained enable miners to escape quickly in an emergency. The final rule requires that when there is a need to determine whether sufficient height or width is provided, MSHA may require a stretcher test where 4 persons carry a miner through the area in question on a stretcher.

This commenter suggested that the results of a stretcher test could be manipulated by having the most fit miners carry the smallest miner. MSHA continues to believe that the stretcher test is appropriate. MSHA's experience is that the stretcher test provides a good measure of the ability of miners to escape.

Since the escape of miners is not impeded, the demonstration that there is no delay in escape assures that there is no reduction in safety.

MSHA received similar comments regarding the dimensions of escapeways developed on or after November 16, 1992, (the effective date of the existing rule). Commenters suggested that where these escapeways pass across or under overcasts or undercasts, the height of the escapeway should be permitted to be less than 5 feet provided the height is sufficient to enable miners, including disabled persons, to escape quickly in an emergency situation. This suggestion is not adopted in the final rule since sufficient clearance should have been provided in these escapeways through proper planning and engineering. Also, MSHA's experience does not reveal any compliance problems associated with the standards since November 1992.

One commenter recommended changing the phrase ''disabled persons'' in paragraph (d)(3) to ''injured persons.'' In support of this recommendation, the commenter stated that the phrase is intended to include persons who may be injured but not necessarily disabled. MSHA does not believe that the change is needed since there are many situations that occur underground that can result in a person being injured but not severely enough to need assistance (i.e. disabled) to be transported from the mine. An escapeway that will permit the transport of disabled persons, i.e. the more severely injured persons, can be expected to accommodate persons with lesser injuries. The term disabled with respect to the concept of injured has existed in the regulations for over 25 years and MSHA is not aware of any problems with its use.

Questions arose during informational meetings regarding the requirements for the height of doors in escapeways. The final rule, like the proposal, permits door heights of less than 5 feet under certain conditions. Under the previous rule, escapeway dimensions, including door heights, were addressed through criteria and operators routinely requested and received approval for lesser dimensions than that in criteria based on a performance test referred to as a ''stretcher test.'' Under the final rule, door heights of less than 5 feet are permitted provided the operator can demonstrate that persons, including disabled persons, can escape without delay. The method of demonstration would be the stretcher test, the same as for the escapeway. Additionally, there are normally few doors in an escapeway and the distance traversed in a door is very short. Passing the stretcher test assures that there would be no diminution of safety under the new provision. Also, since significant pressure differentials can exist in escapeways, doors which are less than 5 feet are easier to open.

Paragraph (d)(4) of the existing rule requires the escapeways be maintained at least 6 foot wide with some exceptions. Widths of less than 6 feet are permitted in either the primary or the alternate escapeway in instances where supplemental roof support is necessary and where the route of travel passes through doors or other permanent ventilation controls. In both cases, existing paragraph (d)(4) requires that the escapeway be at least 4 feet wide. Under the final rule, paragraph (d)(4)(iii) permits the alternate

escapeway to be less than 4 feet wide under certain conditions.

Paragraph (d)(4)(iii) applies to the alternate escapeway only and allows the escapeway width to be less than 4 feet for the same conditions addressed in paragraphs (i) and (ii) if it can be demonstrated that sufficient width is maintained to enable persons, including disabled persons, to escape quickly in an emergency. The conditions that could warrant lesser widths are the locations where the alternate escapeway passes through doors or other permanent ventilation controls, including constructed approaches to permanent ventilation controls and facilities addressed in paragraph (d)(6), or where supplemental roof support is required.

One commenter stated that the alternate escapeway should be maintained at a minimum width of 4 feet without exception and noted that on several occasions miners have been forced to use the alternate escapeway in emergencies. The commenter noted that it could be difficult to transport an injured person on a stretcher at widths under 4 feet. The final rule requires that when there is a need to determine whether adequate width is provided, the stretcher test would be applied.

Under the previous rule, approval had been granted for reduced escapeway widths based on the stretcher test. These approvals were due to the need to provide additional roof support and, in some cases, the need for passage through ventilation controls. Additionally, as newer portions of a mine age and require additional roof support, the final rule allows widths of less than 4 feet in the alternate escapeway where this roof support exists, provided the stretcher test is passed. MSHA believes this approach achieves the intended result of the standard while at the same time addressing the safety issues of providing necessary supplemental roof support and permitting travel in the alternate escapeway.

The preamble to the proposal stated that under the existing standard § 75.380(d)(4) mobile equipment should not be considered when determining escapeway width unless the equipment has been permanently abandoned in the escapeway or would be obstructing the escapeway for a significant portion of a shift. Commenters objected that this interpretation would be unduly restrictive and impractical. Commenters noted that certain parked mobile equipment would enhance miner safety where the equipment could be used to transport people out of the mine in the event of an emergency.

Experience under the existing and the previous rule indicates that track-mounted and rubber-tired equipment which could be used for evacuation should be excluded when determining escapeway widths. Track-mounted supply cars enhance safety by providing a readily available supply of rock dust, roof support material, and other essential safety related material. Section 75.214 requires that a supply of supplementary roof support material and the tools and equipment necessary to install the materials be available at a readily accessible location on each working section or within 4 crosscuts of each working section. In contrast, the Agency received comments that escapeways should be maintained at least 6 feet in width except in rare cases where roof supports could reduce the width to no less than 4 feet over a limited distance.

The final rule takes a practical approach, preserving the requirement that escapeways must be of sufficient width to enable miners, including disabled persons, to escape quickly in an emergency. The final rule also recognizes that certain necessary mining and transportation equipment is located on and near working sections. For example, necessary supply cars containing safety related material like rock dust, roof support, ventilation control construction material, etc., is allowable. Additionally, longwall section equipment commonly includes, but may not be limited to, starter box, water pump, section belt tailpiece and takeup assembly, section transformer, and emulsion pump. Because this equipment is necessary to the operation of the longwall, it also is permitted to be in the escapeway near the working section under the final rule. In continuous miner sections as well as longwall sections, mantrips and personnel transportation equipment, which could be utilized in an emergency evacuation, is allowable. The final rule would not prohibit this equipment in escapeway entries on or near working sections. The rule would require, however, that sufficient clearance be maintained to permit rapid escape.

This aspect of the final rule maintains the historical approach taken to addressing issues of clearance in the confined environment of underground coal mines. The final rule, while permitting reduced dimensions near working sections as discussed above, requires that the escapeways always be maintained of sufficient width to enable miners, including disabled persons, to escape quickly in an emergency. As discussed elsewhere in this preamble, the Agency will assess the adequacy of escapeway widths in such areas by means of the stretcher test to assure that the width is sufficient to enable miners, including disabled persons, to escape quickly in an emergency.

Like the proposal, the final rule in paragraph (d)(5) revises the existing language dealing with the location of escapeways. It provides that escapeways shall be located to follow the most direct, safe and practical route to the nearest mine opening suitable for the safe evacuation of miners. A question arose during an informational meeting as to whether MSHA intended that the existing rule eliminate the requirement that escapeways be routed to the ''nearest mine opening.'' It was not MSHA's intent to change this requirement from the previous standard. The existing requirement that the escapeway follow the most direct route to the surface would, in fact, require the route to go to the nearest mine opening. However, to eliminate any confusion that may exist, the final rule revises paragraph (d)(5) and adopts language similar to that in previous regulation, § 75.1704–2(a), that is, that the escapeway must follow the most direct, safe and practical route to the nearest mine opening suitable for the safe evacuation of miners.

One commenter stated that escapeways should not be permitted to pass an opening to be routed to a more distant opening. Another commenter stated that the nearest mine opening may not always be the safest due to roof conditions or other factors. MSHA acknowledges that the nearest mine opening may not always be the safest route to the surface. A number of factors affect whether or not the safest, most direct, practical route has been selected. These factors include roof conditions, travel height, fan location, physical dimensions of the mine opening, and similar considerations. For example, if bad roof conditions are present along the shortest direct route and those roof conditions are beyond reasonable control, then an alternate ''safe'' route designated by the mine operator may be appropriate. However, the presence of roof falls does not necessarily indicate that the passageway would not be suitable for evacuation if it is reasonable to rehabilitate the area. By way of another example, where coal seam thickness varies to the extreme, the shortest route may be through lower coal, making travel relatively slow and difficult. An alternate route through a high passageway may permit easier travel. Such an alternate route, although longer, may be more practical and therefore may be more appropriate.

Similarly, there can be other instances where the ''nearest mine opening'' may not be suitable for safe evacuation of miners. For example, an old mine shaft may not be safe for travel because of badly deteriorated conditions, such as a deteriorated shaft lining or deteriorated timbers, even though the shaft is still suitable for mine ventilation purposes.

As with the existing standard, mine development projections do not have to be altered to provide additional rooms, entries, or crosscuts for the sole purpose of providing a passageway to the nearest mine opening. However, the construction of ventilation controls such as stoppings, overcasts and undercasts, or the installation of an escape facility may be required to provide the most direct, safe and practical route to the surface.

One commenter suggested that MSHA should require an escapeway plan to be approved by the MSHA district manager to assure the most direct route to the surface. Existing standards require that escapeways be shown on the ventilation map. In addition, as with other regulations, inspectors assess whether escapeways follow the most direct, safe and practical route to the surface during each regular inspection. Accordingly, MSHA does not believe that an additional plan is necessary.

Existing paragraph (f) establishes the requirements for ventilation of the primary escapeway and identifies which equipment can be operated in the primary escapeway and the fire suppression requirements for this equipment. The final rule, like the proposal, modifies paragraph (f) to explicitly identify the equipment that is not permitted in the primary escapeway and to specify the types of fire suppression systems that are to be used and the conditions under which each is to be used on equipment permitted in the primary escapeway. This is done by replacing existing paragraphs (f)(1) and (f)(2) with paragraphs (f)(1) through (f)(7) in the final.

Existing paragraph (f)(1) requires that one escapeway that is ventilated with intake air be designated as the primary escapeway and prohibits certain equipment from being used in the primary escapeway in areas developed after November 15, 1992. Further, paragraph (f)(1) requires fire suppression systems on mobile equipment that is operated in the primary escapeway. The final rule transfers the part of existing paragraph (f)(1) that specifies the area of the primary escapeway affected to paragraph (f)(2).

The existing rule limited the installation or use of certain equipment in areas of the primary escapeway developed after November 15, 1992. Paragraph (f)(2) of the final rule modifies the existing rule for clarity and expands the application of certain requirements contained in paragraphs (f)(3) through (f)(7) to the entire primary escapeway except those areas of the primary escapeway developed prior to March 30, 1970 where separation of the primary escapeway from the belt and trolley haulage entries did not exist as of November 16, 1992. For areas of mines developed after September 15, 1992, (those areas covered by the existing rule) the provisions of paragraphs (f)(3) through (f)(7) will be effective as of March 11, 1997. For other areas covered by the rule, MSHA has provided for a 1 year phase in period to allow mine operators time to effectively plan and implement the necessary changes. The phase in period applies to areas of a primary escapeway developed between March 30, 1970 and November 16, 1992, and to areas of the primary escapeway developed prior to March 30, 1970 where separation of the belt and trolley haulage entries from the primary escapeway existed prior to November 16, 1992.

Paragraph (f)(3) prohibits certain equipment from being in the primary escapeway. Paragraphs (f)(4) and (f)(5) deal with fire protection for mobile equipment that is permitted in the primary escapeway and paragraph (f)(6) addresses a specific circumstance when mobile equipment may operate in a primary escapeway without a fire suppression system. Paragraph (f)(7), a provision added to the proposed language in response to comments, allows the use of designated emergency vehicles or ambulances in the primary escapeway.

One commenter suggested that the final rule should not provide an exception for all areas where separation of the primary escapeway from the belt and trolley haulage entry does not exist. The commenter recognized, however, that Congress granted an exemption from separation requirements for areas of the primary escapeway developed prior to March 30, 1970, the effective date of the Act. The intent of the proposal was to provide an exemption from the requirements of proposed paragraphs (f)(3) through (f)(6) for these same areas. The commenter points out that the proposal would have extended the exemption to other areas of the primary escapeway where, for one reason or another, separation did not exist on November 16, 1992, the effective date of the existing rule. The final rule modifies the proposal to clarify that the exemption only applies to those areas of the escapeway that were developed prior to March 30, 1970 and where separation did not exist on November 16, 1992.

Another commenter correctly interpreted proposed paragraph (f)(2) as extending the requirement that limits the types of equipment permitted in primary escapeways to areas of the mine developed prior to November 16, 1992. The commenter stated that the proposed regulation would pose great cost to the industry with no appreciable safety benefit derived. A review of the fire history relative to both stationary and mobile equipment indicates that fires can and do occur on this equipment. Mobile equipment by design is intended to provide flexibility in movement and is capable of operating anywhere in the mine. Although the accident reports do not specify whether the mobile equipment that caught fire was in the primary escapeway when the fire started, it is reasonable to conclude that at least some of these fires did occur in the primary escapeway. MSHA continues to believe that given the importance of the primary escapeway to the safety of miners, the extension of the requirements for operation of equipment in the primary escapeway is necessary and appropriate.

Paragraph (f)(3) lists the equipment that is not permitted in the primary escapeway. Under paragraph (f)(3)(i) of the final rule, operating diesel equipment without an automatic fire suppression system is prohibited in the primary escapeway unless it is attended, except as provided in paragraphs (f)(6) and (f)(7). One commenter stated that attended diesel equipment with a manual fire suppression system presents no fire hazard. Another commenter suggested that unattended diesel equipment should be prohibited. When diesel equipment is operated in the primary escapeway and is properly attended and equipped with a manual fire suppression system, the equipment operator can immediately respond to a fire, and the safety afforded by the existing standard is maintained. If the machine is shut off, however, attendance is not necessary. When diesel equipment is to be operated unattended, an automatic system is required to protect against fire.

One commenter stated that ''attended'' should be interpreted to mean that the operator is on or within sight of the vehicle. Another commenter urged that the standard be clarified to require that the operator be at the controls of the equipment. For the purposes of § 75.380(f), by ''attended'' MSHA means that the equipment operator would be on the mobile

equipment or immediately adjacent to the equipment and be capable of activating the fire suppression system in the event of a fire.

The existing standard permits equipment to be in the escapeway for purposes of transporting miners and materials and for maintaining the escapeway but does not expressly prohibit the haulage of coal in the primary escapeway. As a matter of clarification, the final rule specifically prohibits coal haulage in the primary escapeway unless incidental to cleanup and maintenance of the escapeway. One commenter supported the proposed prohibition of coal haulage noting that coal haulage would provide a ready source of fuel to a machinery-initiated fire. Several commenters expressed a concern that incidental coal haulage associated with cleanup and maintenance of the primary escapeway would be prohibited under the proposed standard. Cleanup and maintenance of the primary escapeway must be permitted. Therefore, the final rule modifies the proposal to permit mobile equipment to haul coal if incidental to cleanup and maintenance of the primary escapeway.

Paragraph (f)(3)(iii) prohibits compressors in the primary escapeway except as provided in subparagraphs (f)(3)(iii) (A) through (C). Subparagraph (A) allows compressors necessary to maintain the escapeway in safe, travelable condition; (B) allows compressors that are components of equipment such as locomotives and rock dusting machines; and, (C) allows compressors of less than five horsepower due to the limited fire hazard associated with their operation.

One commenter described an incident involving a compressor in an intake airway, which was located in a fireproof enclosure but was improperly ventilated. According to the commenter, smoke and contaminants spread throughout the intake entry and reached the section, which was then evacuated. This illustrates the importance of providing adequate protection from the possible spread of smoke and contaminants associated with compressor fires or overheating.

Paragraph (f)(3)(iv) of the final rule adds battery chargers to the equipment included in the proposal that is permitted in the primary escapeway provided they are located on or near a working section and moved as the section advances or retreats. In all other respects, paragraph (f)(3)(iv) of the final rule adopts the proposal. Under paragraph (f)(3)(iv), underground transformer stations, battery charging stations, substations, and rectifiers cannot be located in the primary escapeway except: (A) where necessary to maintain the escapeway in safe, travelable condition; and (B) battery chargers and rectifiers and power centers with transformers that are either dry-type or contain nonflammable liquid, provided they are located on or near a working section and are moved as the section advances or retreats. The first exception allows work to be performed in the primary escapeway to assure its integrity. The second provides for the locations of the described equipment at or near working sections if the equipment moves with the section. Equipment at or near working sections will normally be within a few crosscuts of the working face. In many cases, particularly with battery chargers, there may be no practical alternative to locating this equipment in the escapeway. In addition, § 75.340 provides additional protection when using underground electrical equipment.

Paragraph (f)(3)(v) of the final rule adopts the proposal and prohibits water pumps from being in the primary escapeway except as provided under paragraphs (f)(3)(v)(A) through (f)(3)(v)(F). The pumps that are permitted in the primary escapeway are the same ones that are excepted from the requirements of § 75.340 due to the low potential for fire associated with their operation. They include: water pumps necessary to maintain the escapeway in safe, travelable condition; submersible pumps; permissible pumps and associated permissible switchgear; pumps located on or near a working section that are moved as the section advances or retreats; pumps installed in anthracite mines; and small portable pumps. While the existing rule refers to the electrical equipment described in § 75.340 (a) and (b)(1), the final rule, like the proposal, lists the affected equipment for the convenience of the reader. Like § 75.340, paragraph (f)(3)(v) applies to water pumps and emulsion pumps when they are located on or near the working section and are moved as the section advances or retreats. One commenter agreed that pumps may be necessary to maintain and rehabilitate the primary escapeway but suggested that a time limit be placed on the length of time the pump is allowed to remain in the escapeway. MSHA believes that specific conditions at the mine will govern the amount of time required for any necessary pumping. Therefore, MSHA has not included the suggestion in the final rule since the decision relative to time must be made on a case-by-case basis, as appropriate.

Paragraph (f)(4) of the final rule adopts MSHA's proposal with one change. As proposed, paragraph (f)(4) would have required the use of fire suppression systems on mobile equipment operated in the primary escapeway, and would have allowed exceptions for continuous miners and as provided in § 75.380 (f)(5) and (f)(6). The final rule adds an additional exception for emergency vehicles or ambulances as provided in § 75.380(f)(7). Unlike the existing standard, the final rule in paragraph (f)(4) permits certain mobile equipment operated in the primary escapeway to be protected with a manual fire suppression system instead of an automatic system, provided it is attended by a person trained in the use and operation of the fire suppression system. MSHA believes that when a piece of equipment is operated in the primary escapeway and is properly attended and equipped with a manual fire suppression system, the equipment operator can immediately respond to the situation, and the safety afforded by the existing standard is maintained.

One commenter stated that no electrical, battery or diesel equipment, or other equipment such as compressors should be allowed in the primary escapeway, except for the purpose of maintenance of the escapeway, and that this equipment should have an appropriate fire suppression system. Because travel in the escapeway in certain mining systems is essential for safety given the design of the mining system used, the recommendation of the commenter has not been adopted in the final rule. Instead, the final rule provides that certain types of mining equipment can be operated in the primary escapeway provided the safety precautions set out in the standard are followed. One commenter stated that the rule should only apply to mobile equipment which is operated in the primary escapeway, since equipment not operating presents little or no hazard. MSHA agrees and has incorporated this clarification into the final rule.

Commenters indicated that it is sometimes necessary to withdraw face equipment, such as continuous miners, roof bolting machines and shuttle cars, into the primary escapeway for a short distance beyond the loading point. The equipment is sometimes parked and left there on down shifts or between shifts. MSHA notes that, as clarified, the final rule does not prohibit this practice. Because the equipment would be attended when operated and is provided with manual fire suppression, the

equipment may be operated in the primary escapeway.

Following promulgation of the existing rule, some persons construed the requirement for an automatic fire suppression system to apply to electric face equipment. As explained in the preamble to the proposal, this was not the intent of MSHA. To clarify its intent, MSHA issued Program Policy Letter No. P92–V–4 on November 16, 1992, addressing the operation and location of equipment in primary escapeways. Under existing regulations in Subpart L—Fire Protection, face equipment is required to be protected by a manual fire suppression system. The final rule recognizes and generally conforms with this requirement. Other than for an exception to permit a situation such as the movement of continuous mining machines between sections without a continuous water supply, the final rule requires that when face machinery, equipped with a manual fire suppression system, is operated in the primary escapeway, it must be attended by a person trained in the proper function and use of the fire suppression system. The continuous mining machine exception recognizes that the fire suppression system for the continuous mining machine often relies on a water supply that may be impracticable to provide during equipment moves.

The final rule requires in paragraph (f)(4) that with exceptions for continuous mining machines and as provided in paragraphs (f)(5), (f)(6), and (f)(7), each piece of mobile equipment operated in primary escapeways shall: (1) be equipped with manually operated fire suppression systems installed in compliance with §§ 75.1107–3 through 75.1107–16 and be attended continuously; or (2) be equipped with an automatic fire suppression system that is capable of both automatic and manual activation and installed in compliance with §§ 75.1107–3 through 75.1107–16. Fire suppression systems which were installed to meet the 1992 rule will continue to be accepted.

Under paragraph (f)(5) of the final rule, personnel carriers and small personnel conveyances designed and used solely for the transportation of personnel and small hand tools can be operated in the primary escapeway if either of the requirements under paragraphs (i) or (ii) are met. This class of equipment would not include diesel-powered pickup trucks, for example, which would be governed by paragraph (f)(4). Paragraph (i) requires a multipurpose dry chemical type automatic fire suppression system capable of both manual and automatic activation. Paragraph (ii) provides an alternative for a class of small, battery powered, golf cart type, equipment used for transport of persons and small hand tools. In this case, fire extinguishers may be used in lieu of a fire suppression system.

Commenters questioned the need for automatic systems on the class of equipment consisting of small, battery powered, golf cart type equipment. One commenter suggested that a manual fire suppression system should be accepted. After a review of the issue, MSHA has concluded that some types of mobile equipment present a very limited fire hazard. In the case of small, battery operated, golf cart type, conveyances designed and used for the transport of personnel and small hand tools, considering the limited hazard, a trained operator provided with two 10 pound multi-purpose dry chemical fire extinguishers is equivalent in protection to a fire suppression system. Accordingly, as an alternative under paragraph (ii), small battery powered, golf cart type, equipment may be operated in the primary escapeway if provided with two 10 pound multi-purpose dry chemical fire extinguishers. Unlike diesel powered equipment, the golf cart type of equipment is shut off when not operating and, therefore, attendance is not an issue. The 10 pound units are standard size extinguishers and are appropriate for the equipment involved.

The system used in accordance with paragraph (i) must be suitable for the intended application and listed or approved by a nationally recognized independent testing laboratory. The language was proposed as two paragraphs but has been combined in the final rule under paragraph (i) and an alternative has been added as paragraph (ii). The types of machinery which fall under paragraph (f)(5) are not required to meet the additional requirements of §§ 75.1107–3 through 75.1107–16. For example, it would be impractical and would not enhance safety to apply the minimum dry chemical poundage requirements of § 75.1107–9 to small equipment designed and used solely for personnel and small hand tools.

During informational meetings, it was suggested that the term ''dry chemical'' would be more accurate and appropriate than the term ''dry powder'' used in the existing standard. Like the proposal, the final rule adopts this language. MSHA received no comments on this proposed revision

Paragraph (f)(6) of the final rule provides an exception to the general requirement and allows mobile equipment not provided with a fire suppression system to operate in the primary escapeway if no persons are inby other than persons directly engaged in the use or moving of the equipment. This provision of the final rule allows for the necessary movement of face equipment, such as between sections.

One commenter stated that the exemption provided in (f)(6) should be expanded to allow equipment that does not have a fire suppression system to be relocated provided monitoring equipment is utilized for carbon monoxide or smoke and two-way communication is available to notify appropriate persons. The final rule does not adopt this suggestion. During moves, equipment is often laboring at maximum capacity and there can be several machines operating simultaneously. Under these conditions, equipment fires can develop quickly and the products of combustion would be carried to inby workers by the ventilating current. By permitting only workers who are directly engaged in the operation or movement of the equipment, the final rule prevents other workers from being exposed to the hazards of a fire on the equipment being moved. Workers operating or engaged in moving the equipment will be in a position to quickly identify the hazard and take necessary action.

Another commenter objected to the provision stating that fire suppression should be required on all equipment in the primary escapeway. This suggestion has not been adopted in the final rule. MSHA does not agree that fire suppression is needed when no persons are inby or downstream of the equipment being moved. MSHA has concluded that either these machines should be equipped with fire suppression, or fire extinguishers as in (f)(5)(ii), or no persons should be inby the location where the equipment is being operated except those persons directly engaged in the operation or movement of the equipment.

Another commenter suggested that the wording of (f)(6) could be read to allow miners to work on a longwall face while equipment not equipped with fire suppression is operated anywhere in the primary escapeway. This is not permitted by the standard. By including the phrase, ''. . . except those persons directly engaged in using or moving the equipment'', the persons affected are only those persons in the immediate vicinity of the machine. With no persons working inby, the use of machinery without a fire suppression system would not expose persons to the hazard of toxic gases and fumes from a fire on the equipment. The language

also would not permit persons to operate mobile equipment without a fire suppression system in the primary escapeway while miners are downstream working on a longwall face. The controlling factor is whether the persons inby are directly engaged in using or moving that particular piece of equipment. If they are, and no one else is inby, the equipment may be operated without a fire suppression system. For example, when moving a longwall shield, no one would be permitted to be inby the machine being used to move the shield if the machine is not provided with a fire suppression system except those persons moving the shield. This would include miners operating other pieces of equipment to move other shields.

Paragraph (f)(7) modifies the existing rule to include a new exemption to the requirement that mobile equipment operated in primary escapeways have a fire suppression system. Paragraph (f)(7) permits mobile equipment designated and used only as emergency vehicles or ambulances to operate in the primary escapeway without fire suppression systems. It was suggested to MSHA that certain types of emergency equipment, such as diesel powered ambulances, should be exempt from the requirements for fire suppression systems. Comments were received suggesting that ambulances should be exempt because space is extremely limited on these vehicles and because they are used infrequently. MSHA recognizes the potential benefit in the use of this type of equipment. Another commenter objected, foreseeing potential abuses of the exemption by mine operators who would designate equipment as ambulances but use it as ordinary equipment. The final rule permits emergency vehicles to be operated in the primary escapeway without fire suppression systems only when this equipment is used for medical emergencies.

This existing rule requires in paragraph (i)(2) that mechanical escape facilities be provided and maintained for, ''. . . each slope that is part of a designated escapeway that is either inclined 18 degrees or more from the horizontal or is inclined 9 degrees or more from the horizontal and is greater than 1,000 feet in length.'' During informational meetings, MSHA became aware of a concern that existing paragraph (i)(2) would permit slopes of significant length and inclination to exist without any mechanical escape facilities. An example would be a slope of 900 feet inclined less than 18 degrees from the horizontal. It was suggested that such a slope could be particularly difficult for passage of injured persons under cold and icy conditions if mechanical escape facilities were not provided. In light of this concern, MSHA proposed to require that mechanical escape facilities be provided and maintained from the coal seam to the surface for each slope that is part of a designated escapeway and is inclined more than 9 degrees from the horizontal. The final rule adopts the proposal.

One commenter objected to proposed paragraph (i)(2) indicating that facilities are unnecessary in low angle slopes which are of short length. Other commenters believed that the 1992 standard was appropriate. Another commenter indicated support for the proposal as a way to enable persons to escape quickly in an emergency. This commenter also noted that escape can be very difficult in icy winter conditions in some slopes. After consideration of the comments received, MSHA concludes that the proposal was appropriate and the final rule adopts this aspect of the proposal.

One commenter suggested that proposed paragraph (i)(2) could be interpreted as requiring mechanical escape facilities for slopes that occur naturally underground. It was not MSHA's intent to apply paragraph (i)(2) to slopes other than from the coal seam to the surface. The final rule clarifies this and requires that mechanical escape facilities be provided for each slope from the coal seam to the surface that is part of a designated escapeway and is inclined more than 9 degrees from the horizontal.

Like the proposal, the final rule in paragraph(d)(5) revises the existing language dealing with the location of escapeways. It provides that escapes shall be located to follow the most direct, safe and practical route to the nearest mine opening suitable for the safe evacuation of miners. A question arose during an informational meeting as to whether MSHA intended that the existing rule eliminate the requirement that escapeways be routed to the ''nearest mine opening.'' It was not MSHA's intent to change this requirement from the previous standard. The existing requirement that the escapeway follow the most direct route to the surface would, in fact, require the route to go to the nearest mine opening. However, to eliminate any confusion that may exist, the final rule revises paragraph (d)(5) and adopts language similar to that in previous regulation, § 75.1704–2(a), that is, that the escapeway must follow the most direct, safe and practical route to the nearest mine opening suitable for the safe evacuation of miners.

One commenter stated that escapeways should not be permitted to pass an opening to be routed to a more distant opening. Another commenter stated that the nearest mine opening may not always be the safest due to roof conditions or other factors. MSHA acknowledges that the nearest mine opening may not always be the safest route to the surface. A number of factors affect whether or not the safest, most direct, practical route has been selected. These factors include roof conditions, travel height, fan location, physical dimensions of the mine opening, and similar considerations. For example, if bad roof conditions are present along the shortest direct route and those roof conditions are beyond reasonable control, then an alternate ''safe'' route designated by the mine operator may be appropriate. However, the presence of roof falls does not necessarily indicate that the passageway would not be suitable for evacuation if it is reasonable to rehabilitate the area. By way of another example, where coal seam thickness varies to the extreme, the shortest route may be through lower coal, making travel relatively slow and difficult. An alternate route through a high passageway may permit easier travel. Such an alternate route, although longer, may be more practical and therefore may be more appropriate. Similarly, there can be instances where the ''nearest mine opening'' may not be suitable for safe evacuation of miners. For example, an old mine shaft may not be safe for travel because of badly deteriorated conditions, such as a deteriorated shaft lining or deteriorated timbers, even though the shaft is still suitable for mine ventilation purposes.

As with the existing standard, mine development projections do not have to be altered to provide additional rooms, entries, or crosscuts for the sole purpose of providing a passageway to the nearest mine opening. However, the construction of ventilation controls such as stoppings, overcasts and undercasts, or the installation of an escape facility may be required to provide the most direct, safe and practical route to the surface.

One commenter suggested that MSHA should require an escapeway plan to be approved by the MSHA district manager to assure the most direct route to the surface. Existing standards require that escapeways be shown on the ventilation map. In addition, as with other regulations, inspectors assess whether escapeways follow the most direct, safe and practical route to the surface during each regular inspection. Accordingly, MSHA does not believe that an additional plan is necessary.

Existing paragraph (f) establishes the requirements for ventilation of the primary escapeway and identifies which equipment can be operated in the primary escapeway and the fire suppression requirements for this equipment. The final rule, like the proposal, modifies paragraph (f) to explicitly identify the equipment that is not permitted in the primary escapeway and to specify the types of fire suppression systems that are to be used and the conditions under which each is to be used on equipment permitted in the primary escapeway. This is done by replacing existing paragraphs (f)(1) and (f)(2) with paragraphs (f)(1) through (f)(7) in the final.

Existing paragraph (f)(1) requires that one escapeway that is ventilated with intake air be designated as the primary escapeway and prohibits certain equipment from being used in the primary escapeway in areas developed after November 15, 1992. Further, paragraph (f)(1) requires fire suppression systems on mobile equipment that is operated in the primary escapeway. The final rule transfers the part of existing paragraph (f)(1) that specifies the area of the primary escapeway affected to paragraph (f)(2).

The existing rule limited the installation or use of certain equipment in areas of the primary escapeway developed after November 15, 1992. Paragraph (f)(2) of the final rule modifies the existing rule for clarity and expands the application of certain requirements contained in paragraphs (f)(3) through (f)(7) to the entire primary escapeway except those areas of the primary escapeway developed prior to March 30, 1970 where separation of the primary escapeway from the belt and trolley haulage entries did not exist as of November 16, 1992. For areas of mines developed after September 15, 1992, (those areas covered by the existing rule) the provisions of paragraphs (f)(3) through (f)(7) will be effective as of March 11, 1997. For other areas covered by the rule, MSHA has provided for a 1 year phase in period to allow mine operators time to effectively plan and implement the necessary changes. The phase in period applies to areas of a primary escapeway developed between March 30, 1970 and November 16, 1992, and to areas of the primary escapeway developed prior to March 30, 1970 where separation of the belt and trolley haulage entries from the primary escapeway existed prior to November 16, 1992.

Paragraph (f)(3) prohibits certain equipment from the primary escapeway. Paragraphs (f)(4) and (f)(5) deal with fire protection for mobile equipment that is permitted in the primary escapeway and paragraph (f)(6) addresses a specific circumstance when mobile equipment may operate in a primary escapeway without a fire suppression system. Paragraph (f)(7), a provision added to the proposed language in response to comments, allows the use of designated emergency vehicles or ambulances in the primary escapeway.

One commenter suggested that the final rule should not provide an exception for all areas where separation of the primary escapeway from the belt and trolley haulage entry does not exist. The commenter recognized, however, that Congress granted an exemption from separation requirements for areas of the primary escapeway developed prior to March 30, 1970, the effective date of the Act. The intent of the proposal was to provide an exemption from the requirements of proposed paragraphs (f)(3) through (f)(6) for these same areas. The commenter points out that the proposal would have extended the exemption to other areas of the primary escapeway where, for one reason or another, separation did not exist on November 16, 1992, the effective date of the existing rule. The final rule modifies the proposal to clarify that the exemption only applies to those areas of the escapeway that were developed prior to March 30, 1970 and where separation did not exist on November 16, 1992.

Another commenter correctly interpreted proposed paragraph (f)(2) as extending the requirement that limits the types of equipment permitted in primary escapeways to areas of the mine developed prior to November 16, 1992. The commenter stated that the proposed regulation would pose great cost to the industry with no appreciable safety benefit derived. A review of the fire history relative to both stationary and mobile equipment indicates that fires can and do occur on this equipment. Mobile equipment by design is intended to provide flexibility in movement and is capable of operating anywhere in the mine. Although the accident reports do not specify whether the mobile equipment that caught fire was in the primary escapeway when the fire started, it is reasonable to conclude that at least some of these fires did occur in the primary escapeway. MSHA continues to believe that given the importance of the primary escapeway to the safety of miners, the extension of the requirements for operation of equipment in the primary escapeway is appropriate.

Paragraph (f)(3) lists the equipment that is not permitted in the primary escapeway. Under paragraph(f)(3)(i) of the final rule, operating diesel equipment without an automatic fire suppression system is prohibited in the primary escapeway unless it is attended, except as provided in paragraphs (f)(6) and (f)(7). One commenter stated that attended diesel equipment with a manual fire suppression system presents no fire hazard. Another commenter suggested that unattended diesel equipment should be prohibited. When diesel equipment is operated in the primary escapeway and is properly attended and equipped with a manual fire suppression system, the equipment operator can immediately respond to a fire, and the safety afforded by the existing standard is maintained. If the machine is shut off, however, attendance is not necessary. When diesel equipment is to be operated unattended, an automatic system is required to protect against fire.

One commenter stated that ''attended'' should be interpreted to mean that the operator is on or within sight of the vehicle. Another commenter urged that the standard be clarified to require that the operator be at the controls of the equipment. For the purposes of § 75.380(f), by ''attended'' MSHA means that the equipment operator would be on the mobile equipment or immediately adjacent to the equipment and be capable of activating the fire suppression system immediately in the event of a fire.

The existing standard permits equipment to be in the escapeway for purposes of transporting miners and materials and for maintaining the escapeway but does not expressly prohibit the haulage of coal in the primary escapeway. As a matter of clarification, the final rule specifically prohibits coal haulage in the primary escapeway unless incidental to cleanup and maintenance of the escapeway. One commenter supported the proposed prohibition of coal haulage noting that coal haulage would provide a ready source of fuel to a machinery-initiated fire. Several commenters expressed a concern that incidental coal haulage associated with cleanup and maintenance of the primary escapeway would be prohibited under the proposed standard. Cleanup and maintenance of the primary escapeway must be permitted. Therefore, the final rule modifies the proposal to permit mobile equipment to haul coal if incidental to cleanup and maintenance of the primary escapeway.

Paragraph (f)(3)(iii) prohibits compressors in the primary escapeway except as provided in subparagraphs (f)(3)(iii) (A) through (C). Subparagraph

(A) allows compressors necessary to maintain the escapeway in safe, travelable condition; (B) allows compressors that are components of equipment such as locomotives and rock dusting machines; and, (C) allows compressors of less than five horsepower due to the limited fire hazard associated with their operation.

One commenter described an incident involving a compressor in an intake airway, which was located in a fireproof enclosure but was improperly ventilated. According to the commenter, smoke and contaminants spread throughout the intake entry and reached the section, which was then evacuated. This illustrates the importance of providing adequate protection from the possible spread of smoke and contaminants associated with compressor fires or overheating.

Paragraph (f)(3)(iv) of the final rule adds battery chargers to the equipment included in the proposal that is permitted in the primary escapeway provided it is located on or near a working section and is moved as the section advances or retreats. In all other respects, paragraph (f)(3)(iv) of the final rule adopts the proposal. Under paragraph (f)(3)(iv), underground transformer stations, battery charging stations, substations, and rectifiers cannot be located in the primary escapeway except: (A) where necessary to maintain the escapeway in safe, travelable condition; and (B) battery chargers and rectifiers and power centers with transformers that are either dry-type or contain nonflammable liquid, provided they are located on or near a working section and are moved as the section advances or retreats. The first exception allows work to be performed in the primary escapeway to assure its integrity. The second provides for the locations of the described equipment at or near working sections if the equipment moves with the section. Equipment at or near working sections will normally be within a few crosscuts of the working face. In many cases, particularly with battery chargers, there may be no practical alternative to locating this equipment in the escapeway. In addition, § 75.340 provides additional protection when using underground electrical equipment.

Paragraph (f)(3)(v) of the final rule adopts the proposal and prohibits water pumps from being in the primary escapeway except as provided under paragraphs (f)(3)(v)(A) through (f)(3)(v)(F). The pumps that are permitted in the primary escapeway are the same ones that are excepted from the requirements of § 75.340 due to the low potential for fire associated with their operation. They include: water pumps necessary to maintain the escapeway in safe, travelable condition; submersible pumps; permissible pumps and associated permissible switchgear; pumps located on or near a working section that are moved as the section advances or retreats; pumps installed in anthracite mines; and small portable pumps. While the existing rule refers to the electrical equipment described in § 75.340 (a) and (b)(1), the final rule, like the proposal, lists the affected equipment for the convenience of the reader. Like § 75.340, paragraph (f)(3)(v) applies to water pumps and emulsion pumps when they are located on or near the working section and are moved as the section advances or retreats. One commenter agreed that pumps may be necessary to maintain and rehabilitate the primary escapeway but suggested that a time limit be placed on the length of time the pump is allowed to remain in the escapeway. MSHA believes that specific conditions at the mine will govern the amount of time required for any necessary pumping. Therefore, MSHA has not included the suggestion in the final rule since the decision relative to time must be made on a case-by-case basis, as appropriate.

Paragraph (f)(4) of the final rule adopts MSHA's proposal with one change. As proposed, paragraph (f)(4) would have required the use of fire suppression systems on mobile equipment operated in the primary escapeway, and would have allowed exceptions for continuous miners and as provided in § 75.380(f)(5)and (f)(6). The final rule adds an additional exception for emergency vehicles or ambulances as provided in § 75.380(f)(7). Unlike the existing standard, the final rule in paragraph (f)(4) permits certain mobile equipment operated in the primary escapeway to be protected with a manual fire suppression system instead of an automatic system, provided it is continuously attended by a person trained in the use and operation of the fire suppression system. MSHA believes that when a piece of equipment is operated in the primary escapeway and is properly attended and equipped with a manual fire suppression system, the equipment operator can immediately respond to the situation, and the safety afforded by the existing standard is maintained.

One commenter stated that no electrical, battery or diesel equipment, or other equipment such as compressors should be allowed in the primary escapeway, except for the purpose of maintenance of the escapeway, and that this equipment should have an appropriate fire suppression system. Because travel in the escapeway in certain mining systems is essential for safety given the design of the mining system used, the recommendation of the commenter has not been adopted in the final rule. Instead, the final rule provides that certain types of mining equipment can be operated in the primary escapeway provided the safety precautions set out in the standard are followed. One commenter stated that the rule should only apply to mobile equipment which is operated in the primary escapeway, since equipment not operating presents little or no hazard. MSHA agrees and has incorporated this clarification into the final rule.

Commenters indicated that it is sometimes necessary to withdraw face equipment, such as continuous miners, roof bolting machines and shuttle cars, into the primary escapeway for a short distance beyond the loading point. The equipment is sometimes parked and left there on down shifts or between shifts. MSHA notes that, as clarified, the final rule does not prohibit this practice. Because the equipment would be attended when operated and is provided with manual fire suppression, the equipment may be operated in the primary escapeway.

Following promulgation of the existing rule, some persons construed the requirement for an automatic fire suppression system to apply to electric face equipment. As explained in the preamble to the proposal, this was not the intent of MSHA. To clarify its intent, MSHA issued Program Policy Letter No. P92–V–4 on November 16, 1992, addressing the operation and location of equipment in primary escapeways. Under existing regulations in Subpart L—Fire Protection, face equipment is required to be protected by a manual fire suppression system. The final rule recognizes and generally conforms with this requirement. Other than for an exception to permit a situation such as the movement of continuous mining machines between sections without a continuous water supply, the final rule requires that when face machinery, equipped with a manual fire suppression system, is operated in the primary escapeway, it must be attended by a person trained in the proper function and use of the fire suppression system. The continuous mining machine exception recognizes that the fire suppression system for the continuous mining machine often relies on a water supply that may be impracticable to provide during equipment moves.

The final rule requires in paragraph (f)(4) that with exceptions for continuous mining machines and as provided in paragraphs (f)(5), (f)(6), and (f)(7), each piece of mobile equipment operated in primary escapeways shall: (1) be equipped with manually operated fire suppression systems installed in compliance with §§ 75.1107–3 through 75.1107–16 and be attended continuously; or (2) be equipped with an automatic fire suppression system that is capable of both automatic and manual activation and installed in compliance with §§ 75.1107–3 through 75.1107–16.

Under paragraph (f)(5) of the final rule, personnel carriers and small personnel conveyances designed and used solely for the transportation of personnel and small hand tools can be operated in the primary escapeway if either of the requirements under paragraphs (i) or (ii) are met. Paragraph (i) requires a multipurpose dry chemical type automatic fire suppression system capable of both manual and automatic activation. Paragraph (ii) provides an alternative for a class of small, battery powered, golf cart type, equipment used for transport of persons and small hand tools. In this case, fire extinguishers may be used in lieu of a fire suppression system.

Commenters questioned the need for automatic systems on the class of equipment consisting of small, battery powered, golf cart type equipment. One commenter suggested that a manual fire suppression system should be accepted. After a review of the issue, MSHA has concluded that some types of mobile equipment present a very limited fire hazard. In the case of small, battery operated, golf cart type, conveyances designed and used for the transport of personnel and small hand tools, considering the limited hazard, a trained operator provided with two 10 pound multi-purpose dry chemical fire extinguishers is equivalent in protection to a fire suppression system. Accordingly, as an alternative under paragraph (ii), small battery powered, golf cart type, equipment may be operated in the primary escapeway if provided with two 10 pound multi-purpose dry chemical fire extinguishers. Unlike diesel powered equipment, the golf cart type of equipment is shut off when not operating and, therefore, attendance is not an issue. The 10 pound units are standard size extinguishers and are appropriate for the equipment involved.

The system used in accordance with paragraph (i) must be suitable for the intended application and listed or approved by a nationally recognized independent testing laboratory. The language was proposed as two paragraphs but has been combined in the final rule under paragraph (i) and an alternative has been added as paragraph (ii). The types of machinery which fall under paragraph (f)(5) are not required to meet the additional requirements of §§ 75.1107–3 through 75.1107–16. For example, it would be impractical and would not enhance safety to apply the minimum dry chemical poundage requirements of § 75.1107–9 to small equipment designed and used solely for personnel and small hand tools.

During informational meetings, it was suggested that the term ''dry chemical'' would be more accurate and appropriate than the term ''dry powder'' used in the existing standard. Like the proposal, the final rule adopts this language. MSHA received no comments on this proposed revision.

Paragraph (f)(6) of the final rule provides an exception to the general requirement and allows mobile equipment not provided with a fire suppression system to operate in the primary escapeway if no persons are inby other than persons directly engaged in the use or moving of the equipment. This provision of the final rule allows for the necessary movement of face equipment, such as between sections.

One commenter stated that the exemption provided in (f)(6) should be expanded to allow equipment that does not have a fire suppression system to be relocated provided monitoring equipment is utilized for carbon monoxide or smoke and two-way communication is available to notify appropriate persons. The final rule does not adopt this suggestion. During moves, equipment is often laboring at maximum capacity and there can be several machines operating simultaneously. Under these conditions, equipment fires can develop quickly and the products of combustion would be carried to inby workers by the ventilating current. By permitting only workers who are directly engaged in the operation or movement of the equipment, the final rule prevents other workers from being exposed to the hazards of a fire on the equipment being moved. Workers operating or engaged in moving the equipment will be in a position to quickly identify the hazard and take necessary action.

Another commenter objected to the provision stating that fire suppression should be required on all equipment in the primary escapeway. This suggestion has not been adopted in the final rule. MSHA does not agree that fire suppression is needed when no persons are inby or downstream of the equipment being moved. MSHA has concluded that either these machines should be equipped with fire suppression, or fire extinguishers as in (f)(5)(ii), or no persons should be inby the location where the equipment is being operated except those persons directly engaged in the operation or movement of the equipment.

Another commenter suggested that the wording of (f)(6) could be read to allow miners to work on a longwall face while equipment not equipped with fire suppression is operated anywhere in the primary escapeway. This is not permitted by the standard. By including the phrase, ''* * * except those persons directly engaged in using or moving the equipment'', the persons affected are only those persons in the immediate vicinity of the machine. With no persons working inby, the use of machinery without a fire suppression system would not expose persons to the hazard of toxic gases and fumes from a fire on the equipment. The language also would not permit persons to operate mobile equipment without a fire suppression system in the primary escapeway while miners are downstream working on a longwall face. The controlling factor is whether the persons inby are directly engaged in using or moving that particular piece of equipment. If they are, and no one else is inby, the equipment may be operated without a fire suppression system. For example, when moving a longwall shield, no one would be permitted to be inby the machine being used to move the shield if the machine is not provided with a fire suppression system except those persons moving the shield. This would include miners operating other pieces of equipment to move other shields.

Paragraph (f)(7) modifies the existing rule to include a new exemption to the requirement that mobile equipment operated in primary escapeways have a fire suppression system. Paragraph (f)(7) permits mobile equipment designated and used only as emergency vehicles or ambulances to operate in the primary escapeway without fire suppression systems. It was suggested to MSHA that certain types of emergency equipment, such as diesel powered ambulances, should be exempt from the requirements for fire suppression systems. Comments were received suggesting that ambulances should be exempt because space is extremely limited on these vehicles and because they are used infrequently. MSHA recognizes the potential benefit in the use of this type of equipment. Another commenter objected, foreseeing potential abuses of

the exemption by mine operators who would designate equipment as ambulances but use it as ordinary equipment. The final rule permits emergency vehicles to be operated in the primary escapeway without fire suppression systems only when this equipment is used only for medical emergencies.

This existing rule requires in paragraph (i)(2) that mechanical escape facilities be provided and maintained for, ''. . . each slope that is part of a designated escapeway that is either inclined 18 degrees or more from the horizontal or is inclined 9 degrees or more from the horizontal and is greater than 1,000 feet in length.'' During informational meetings, MSHA became aware of a concern that existing paragraph (i)(2) would permit slopes of significant length and inclination to exist without any mechanical escape facilities. An example would be a slope of 900 feet inclined less than 18 degrees from the horizontal. It was suggested that such a slope could be particularly difficult for passage of injured persons under cold and icy conditions if mechanical escape facilities were not provided. In light of this concern, MSHA proposed to require that mechanical escape facilities be provided and maintained from the coal seam to the surface for each slope that is part of a designated escapeway and is inclined more than 9 degrees from the horizontal. The final rule adopts the proposal.

One commenter objected to proposed paragraph (i)(2) indicating that facilities are unnecessary in low angle slopes which are of short length. Other commenters believed that the 1992 standard was appropriate. Another commenter indicated support for the proposal as a way to enable persons to escape quickly in an emergency. This commenter also noted that escape can be very difficult in icy winter conditions in some slopes. After consideration of the comments received, MSHA concludes that the proposal was appropriate and the final rule adopts this aspect of the proposal.

One commenter suggested that proposed paragraph (i)(2) could be interpreted as requiring mechanical escape facilities for slopes that occur naturally underground. It was not MSHA's intent to apply paragraph (i)(2) to slopes other than from the coal seam to the surface. The final rule clarifies this and requires that mechanical escape facilities be provided for each slope from the coal seam to the surface that is part of a designated escapeway and is inclined more than 9 degrees from the horizontal.

Section 75.382 Mechanical Escape Facilities

Because an escapeway route can sometimes be very long, the most safe, direct and practical route to the surface can sometimes involve the use of a mechanical escape device such as an automatic elevator or similar, but less sophisticated, device. Section 75.382 contains the requirements for mechanical escape facilities installed in escapeways under § 75.380 and § 75.381. The final rule contains a new requirement for certification of escape facility examinations, proposed as paragraph (g). The final rule does not retain the other proposed changes, paragraphs (h) and (i), that would have added recordkeeping and countersigning requirements.

Under paragraph (g) of the final rule, the designated examiner certifies by date, time, and initials that the mechanical escape facilities examination required by paragraph § 75.382(c) was performed. The certification must be located at or near the facility examined. Certification has long been an accepted practice in the mining industry for assuring that a required examination has been completed. One commenter agreed that certification is necessary and supported the revision. The commenter indicated that the facilities are often designated as escapeways and therefore there should be some assurance that the facilities have been examined and are ready for use. Also, in the case of mechanical escape facilities, if certification is not provided, precious time could be lost as the escape facility is tested prior to use to determine if it is functional and safe.

Under the proposed paragraphs (h) and (i), a record would have had to be made of the examination of the escape facility performed in accordance with § 75.382 (c). The results of the examination would be included in a record, including any deficiency found along with the corrective actions taken to correct the condition. One commenter supported the revision requiring records of deficiencies found during examinations as well as a record of corrective actions. Other commenters objected to additional records, noting that they would not enhance safety. After review of the comments, MSHA has concluded that certification will achieve the intended objective of assuring the safety of mechanical escape. Accordingly, the recordkeeping requirements proposed as paragraphs (h) and (i) are omitted from the final rule.

One commenter stated that many companies utilize mobile escape facilities to cover more than one mine if the mines are located in close proximity. The commenter believed that such an arrangement was not considered in the countersigning provisions of the proposal and stated, ''The effort required to go to each mine every week and track down the mine foreman would be burdensome and unnecessary.'' Paragraph (c) of the existing rule requires a weekly examination and a weekly test in which the hoist must be run through one complete cycle of operation to determine that it is operating properly. The final rule requires certification to be completed by the examiner. As indicated above, MSHA has concluded that certification will achieve the intended objective of assuring that the examinations have been conducted.

Additional comments were received recommending further modifications and additions to § 75.382. For example, a commenter recommended 2-way communication capability, with supplies and a holding area at the escape facility. These types of comments related to issues outside the scope of the rulemaking and were not addressed. Another commenter would have MSHA reinstate language from an earlier rule, alleging a reduction in protection. MSHA does not believe that there is a reduction in protection. Also, the final rule did not propose to change the existing requirement that the commenter claimed reduced protection, i.e., that a person trained to operate the mechanical escape facility always shall be available. MSHA notes that this issue is outside the scope of the rulemaking.

Section 75.383 Escapeway Maps and Drills

When a fire, explosion or other emergency necessitates an immediate evacuation of a mine the designated route for miners to leave the mine is the escapeway. During a mine fire, passageways, even those designated as escapeways, can become smoke filled and the ability to see can be drastically reduced. Therefore, it is vitally important that miners know the route of travel through the escapeway. Section 75.383 provides for the posting of escapeway maps so that they are available for miners to study and use during an emergency, if necessary. Section 75.383 also provides for miners to be trained in the escape route through escapeway drills. Escapeway drills in mines are similar to fire drills in schools and high rise buildings.

Existing paragraphs (a) and (b)(1) of § 75.383 deal with the escapeway map and drill requirements in areas where mechanized mining equipment is being

installed or removed. Based on comments received, the final rule contains 2 revisions to the proposal. The first allows the mine map to be readily accessible as an alternative to posting. The second requires that miners who are underground when any change is made to the escapeway map be immediately notified of the change. These revisions to the proposal are discussed below.

One commenter supported the requirements of (a) and (b)(1) noting the hazards and activities where mechanized mining equipment is being installed or removed. Another commenter stated that the requirement that the map be ''posted'' is impractical in some mines. The commenter stated that the rule should simply require that the map be maintained on the section to allow the map to be maintained in a map tube, or be covered. The commenter also indicated that a map tube could aid miners in a rapid escape since the map and tube could easily be taken with the miners during the escape. MSHA agrees that the maintenance of a posted map could be difficult in some conditions such as in wet or very low height mines. Accordingly, the final rule provides an option wherein the map may be either posted or be maintained in a location readily accessible to all miners. In specifying ''readily accessible'' MSHA intends that all miners be made aware of the map location and have access to review the map at any time. As an example, a map secured in a locked tool chest would not be acceptable.

One commenter objected to paragraph (a) in two respects. First, according to the commenter, the standard does not require maps to show the revised escapeway routes until the end of the shift on which the changes are made. The commenter believes that changes are projected in advance and therefore the maps should be updated immediately. Second, the commenter indicated that the requirement that miners must be informed of the changes before entering the mine does not address affected miners already underground. Many changes within escapeways are not known or planned well in advance. Often, such revisions are in response to changing conditions underground. MSHA does not believe that allowing a portion of one shift is an excessive amount of time to update the maps. MSHA does agree, however, that changes to the escapeways should be immediately brought to the attention of all miners who are underground at the time of a change. Accordingly, the final rule specifies that all affected miners already underground must be immediately notified of the change. This will assure that all affected miners are aware of the change from the time the change is implemented.

While agreeing that each miner's familiarity with escapeways is important, one commenter stated that requiring travel by foot in the escapeways could cause undue physical stress to some miners in low or steeply pitching seams. The commenter continued that the desired result could be obtained by requiring full participation in drills where transportation is provided and full participation in drills where transportation is not provided, unless that escapeway is equipped with a continuous, directional life line. MSHA notes that the standard does not require travel on foot. Transportation may be used for escapeway drills provided that the purpose of the standard can be achieved. That purpose is to assure that miners are familiar with the escapeway routes and, as specified in (b)(4), before or during practice escapeway drills, miners shall be informed of the locations of fire doors, check curtains, changes in the routes of travel, and plans for diverting smoke from escapeways. Traveling an escapeway in a completely enclosed mantrip, such that the route could not be observed, would not meet the requirement. As to the concept of exempting drills in the alternate escapeway where mechanized transportation is unavailable if a directional lifeline exists, MSHA believes that certain minimum specifications for lifelines would be needed before such a compliance alternative could be considered. This would expand the scope of this rulemaking beyond the proposal.

One commenter suggested an expansion of 75.383 to require: directional life lines in both escapeways; communications in both escapeways; numbering of all stoppings along escapeways; additional SCSR caches; hard hat stickers depicting escapeways and SCSR donning procedures; and other measures. While many of the suggestions may have merit, they are outside the scope of this rulemaking.

In the proposal, MSHA solicited comments on a concept to allow individual miners to opt out of escapeway drills for health reasons. One commenter indicated that a number of additional requirements would be needed to assure that any miners opting out would still remain familiar with the escapeways. After considering the comments received, MSHA has not included an option for miners to opt out of the escapeway drills. As one commenter pointed out, it is essential that each miner be familiar with the escapeways. MSHA concludes that a number of accommodations can be made to provide assistance to any miner experiencing difficulty during drills. As discussed above, mobile equipment may be used provided that the conveyance is not so enclosed that miners cannot observe the route. Operators can allow additional time for miners who may encounter difficulty. Also, assistance can be provided by other miners, particularly in difficult areas such as unusually steep grades. Such assistance would likely also be needed in an actual emergency and therefore the drills would be particularly instructive to all the miners participating in the drills.

MSHA believes that for areas where mechanized mining equipment is being installed or removed, providing escapeways and posting maps identifying these escapeways and conducting the drills specified in the standard are essential to maintain safety. These requirements help to assure that miners are familiar with escape routes so that should urgent escape become necessary, they can reach the surface as quickly as possible.

Section 75.384 Longwall and Shortwall Travelways

Modern mining methods include removing large blocks of coal in one continuous operation along a wall which can be several hundred feet long. This method is known as longwall or shortwall mining. To avoid trapping miners in the face area without a means of escape in the event of an emergency, there is a need to have a travelway on the side of the block of coal opposite the escapeways. Section 75.384 addresses the requirements for a travelway on the tailgate side of a longwall or shortwall, the location and marking of the travelway, and procedures to follow during a blockage of the travelway.

MSHA proposed no changes to the existing rule. Likewise, the final rule makes no changes to the existing rule. The preamble to the proposal explained that MSHA had received comment suggesting that the existing rule be modified to provide for additional involvement by miners when a roof fall or other blockage occurs that prevents travel in the tailgate travelway. MSHA believes that the existing procedures and regulations appropriately address the hazards and provide a sufficient opportunity for input and involvement for all interested parties. The preamble to the proposal contains a discussion of the existing procedures and regulations.

One commenter recommended several additions to existing § 75.384 while

agreeing that maintenance of a tailgate travelway is essential. The recommendations included requiring the tailgate travelway to be ventilated by intake air. The commenter noted that several mines presently ventilate in this manner, providing intake air splits at both headgate and tailgate. While this system has certain advantages, it is not feasible or practical in all cases.

Section 75.388 Boreholes in Advance of Mining.

Areas of a mine, or of an adjacent mine, can be located in close proximity to an advancing working place but can be inaccessible for a variety of reasons. These inaccessible areas of a mine can present hazards when mining proceeds inadvertently or improperly into these areas. Inaccessible areas may contain potentially dangerous accumulations of gases or water, which could result in explosions or inundations. To protect against these hazards, § 75.388 requires operators to drill boreholes into the coal before they extract it. In this manner, the operator can determine whether mining, if continued, will penetrate an area where unknown hazards may be present. Boreholes are not required when the area toward which mining is advancing is accessible and is properly examined.

The final rule revises requirements for the drilling of boreholes in advance of mining. It requires boreholes to be drilled in both ribs of advancing working places unless an alternative drilling plan is approved by the district manager in accordance with existing paragraph (g) of this section. Existing paragraph (c) requires that boreholes be drilled in at least one rib of advancing working places described in § 75.388 (a). Although MSHA did not intend any change in promulgating the existing language, comments indicated that some confusion existed. To address this issue, MSHA proposed to revise the existing standard and adopt language similar to the regulation which was in effect prior to 1992. The proposed revisions to § 75.388 (c) would have required bore holes to be drilled in one or both ribs of advancing working places described in § 75.388(a), ''. . . as may be necessary for adequate protection of miners in such working places.''

Several comments were received in response to the proposal. One commenter indicated that the proposed revision was unnecessary since the 1992 standard adequately indicated that more than one rib may need to be drilled. Another commenter stated that drilling one rib is always adequate since required drilling in adjacent places will assure that the entire area is explored by drilling. MSHA's experience is that working places are seldom developed at the same rate and some may lag by significant distances. In addition, entry or room centers are ordinarily in excess of the 20 foot drill hole depth specified in the standard. Thus, coverage over the entire width of the advancing section is not always provided as suggested by the commenter. Another example would be where an advance heading approaches an inaccurately mapped abandoned mine such that the unknown workings are approached near the undrilled ribline. An inundation could occur at the undrilled ribline as the working place advanced. To address these hazards, the final rule requires drilling of both ribs. If the workings were not discovered through drilling, multiple fatalities could result from inundations of water, methane, or oxygen deficient atmosphere (black damp). Accidents similar to this scenario have occurred and resulted in inundations of water, methane, or irrespirable atmospheres.

One commenter noted that 38 inundations of gases or water occurred between 1990 and 1994. MSHA notes that this number represents only those accidental cut-throughs which resulted in inundations. It should be noted that numerous additional accidental cut-throughs have occurred which did not result in inundations. Each of these additional accidental cut-throughs demonstrates the potential for a serious or fatal accident. The commenter stated that the number of inundations and the potential for multiple fatalities warrant a revision to the standard to require both ribs to be drilled. Similar comments and examples were heard during the public hearings. MSHA agrees.

MSHA concludes that in general, both ribs should be drilled; however, under some circumstances drilling of both ribs may be unnecessary. Moreover, MSHA recognizes that there are circumstances where it would be unnecessary to drill both ribs at all times. Thus, the final rule requires that both ribs be drilled unless the district manager grants approval for an alternative drilling pattern under existing paragraph (g). Under existing paragraph (g), an alternative drilling pattern may be approved which may not require drilling of both ribs. As with other plans which are subject to approval, requests for alternative drilling patterns will be reviewed on a case by case basis. After considering all comments received discussing this issue, MSHA has concluded that the hazard of an inundation is properly addressed by the final rule which retains sufficient flexibility for a site specific drilling pattern if the district manager can be satisfied that the alternative is suitable to the particular circumstances.

Another comment suggested that the minimum distances which trigger drilling as specified in § 75.388 (a)(1), (a)(2), and (a)(3) be revised to 100, 500, and 500 feet, respectively. In support of the suggestion, the commenter noted factors such as inaccurate old mine maps, unmapped mining over-boundary or outside the legal limits, lost maps or unknown mines, and less than diligent research by some operators. The minimum drilling distances in paragraph (a) were not proposed for revision and the final rule does not address them. However, it is important to note that the distances specified are the minimum at which drilling must begin if there is reasonable confidence in the position of the old workings. The distances specified provide a safety factor to account for slight mining overruns, mapping errors, small deliberate omissions, and similar factors in cases where the position of the old workings are known with reasonable certainty. In cases where old workings are known to exist but the position is unknown or known with little confidence, drilling would be necessary in excess of the minimum distances specified in (a) to assure compliance with the standard.

Section 75.389 Mining into Inaccessible Areas

While § 75.388 addresses the need to identify inaccessible areas to avoid accidentally drilling into an area containing a possible hazardous environment, § 75.389 establishes procedures for drilling into an inaccessible area that has been identified. Section 75.389 requires a separate plan be developed and approved for drilling into inaccessible areas. Paragraph (c) of the final rule clarifies that the requirements of § 75.389(c)(1), (c)(2) and (c)(3) do not apply to routine mining-through operations that are part of a retreat section ventilation system approved in accordance with § 75.371(f) and (x). The final rule retains the proposed language.

The preamble to the proposal pointed out that, based on comments received during informational meetings and other discussions, differing interpretations of the application of existing § 75.389 existed. Some persons were interpreting paragraph (c) as requiring, for example, the mine to be evacuated during the break-through of a pillar split in a retreating section. However, paragraphs (a) through (c) of § 75.389 were intended to apply during mining-through operations in areas subject to § 75.388

where hazards and potential hazards may be unknown. The final rule revises existing § 75.389(c) by adding an exception for routine mining-through operations that are a part of a retreat mining system approved in the mine ventilation plan. In some circumstances, the mining through occurs during routine mining into an area which is covered by an approved mine ventilation plan. In this case, the potential hazards have already been addressed in the mine ventilation plan. Requiring the operator to submit duplicate plans would not result in any safety benefit; therefore, the level of safety provided by the existing standard is maintained.

Petitions for Modification

Operators with petitions for modification that involve the standards revised in this rulemaking need to determine the status of those petitions before the effective date of the rule. If there are sections of this rule that are renumbered but remain substantively unchanged from the existing standards, operators with modifications granted for these standards need not reapply. However, operators with petitions for modifications granted for standards that have been revised must comply with the new rule on its effective date. New petitions for modification of the final rule may be submitted under 30 CFR part 44. If Agency assistance is needed, questions should be directed to the appropriate MSHA district office.

Derivation Table

The following derivation table lists the number of each final standard and the number of the existing standard from which it is derived.

New section	Old section
75.301	Partly new, 75.301.
75.310(a)(3)	Partly new, 75.310(a)(3).
75.310(a)(4)	Partly new, 75.310(a)(4).
75.310(c)	Partly new, 75.310(c).
75.310(c)(1)	Partly new, 75.310(c).
75.310(c)(2)	75.310(c).
75.310(c)(3)	New.
75.310(c)(4)	Partly new, 75.310(c).
75.310(c)(4)(i)	75.310(c)(1).
75.310(c)(4)(ii)	75.310(c)(2).
75.310(c)(5)	New.
75.311(d)	Partly new, 75.311(d).
75.312(a)	Partly new, 75.312(a).
75.312(b)(1)	Partly new, 75.312(b)(1).
75.312(b)(1)(i)	New.
75.312(b)(1)(ii)	75.312(b)(1) through(b)(1)(ii).
75.312(c)	Partly new, 75.312(c).
75.312(d)	Partly new, 75.312(d).
75.312(f)(1)	75.312(f).
75.312(f)(2)	New.
75.312(g)(1)	Partly new, 75.312(g)(1).
75.312(g)(2)	New.
75.312(g)(3)	Partly new, 75.312(g)(3).
75.312(h)	Partly new, 75.312(h).
75.313(a)(1)	75.313(a)(1).
75.313(a)(2)	75.313(a)(2).
75.313(a)(3)	75.313(a)(3).
75.313(b)	75.313(b).
75.313(c)(1)	75.313(c)(1).
75.313(c)(2)	Partly new, 75.313(c)(2).
75.313(c)(3)	Partly new, 75.313(c)(3).
75.313(d)(1)(i)	Partly new, 75.313(d)(1)(i).
75.313(d)(1)(ii)	Partly new, 75.313(d)(1)(ii).
75.313(d)(2)	Partly new, 75.313(d)(2).
75.320(e)	New.
75.321(a)(1)	Partly new, 75.321(a).
75.321(a)(2)	Partly new, 75.321(a).
75.323(b)(1)	75.323(b)(1).
75.323(b)(1)(i)	75.323(b)(1)(i).
75.323(b)(1)(ii)	Partly new, 75.323(b)(1)(ii).
75.323(b)(1)(iii)	75.323(b)(1)(iii).
75.323(b)(2)	75.323(b)(2).
75.323(b)(2)(i)	75.323(b)(2)(i).
75.323(b)(2)(ii)	75.323(b)(2)(ii).
75.323(c)(1)	Partly new, 75.323(c)(1).
75.323(d)(2)(i)	Partly new, 75.323(d)(2)(i).
75.325(d)	Partly new, 75.325(d).
75.330(c)	New.
75.332(a)(1)	75.332(a)(1).
75.333(a)	Partly new, 75.333(a).
75.333(b)(1)	Partly new, 75.333(b)(1).
75.333(b)(3)	Partly new, 75.333(b)(3).
75.333(b)(4)	Partly new, 75.333(b)(4).
75.333(e)(1)(i)	Partly new, 75.333(e)(1).
75.333(e)(1)(ii)	Partly new, 75.333(e)(2).
75.333(h)	75.333(e)(1).
75.334(e)	Partly new, 75.334(e).

New section	Old section
75.334(f)(3)	Partly new, 75.334(f)(3).
75.340(a)	Partly new, 75.340(a).
75.342(a)(4)	Partly new, 75.342(a)(4).
75.342(a)(4)(i)	New.
75.342(a)(4)(ii)	New.
75.342(a)(4)(iii)	New.
75.344(a)	Partly new, 75.344(a).
75.344(a)(1)	Partly new, 75.344(b)(1).
75.344(a)(2)	Partly new, 75.344(a)(1).
75.344(a)(2)(i)	75.344(b)(2)(i).
75.344(a)(2)(ii)	75.344(b)(2)(ii).
75.344(b)	Partly new, 75.344(a)(2).
75.344(e)	New.
75.360(a)(1)	Partly new, 75.360(a)(1).
75.360(a)(2)	New.
75.360(b)	75.360(b).
75.360(b)(1)	Partly new, 75.360(b)(1).
75.360(b)(3)	Partly new, 75.360(b)(3).
75.360(b)(4)	Partly new, 75.360(b)(4).
75.360(b)(6)(i)	Partly new, 75.360(b)(6).
75.360(b)(6)(ii)	Partly new, 75.360(b)(6).
75.360(b)(8)	New.
75.360(b)(9)	New.
75.360(b)(10)	New.
75.360(e)	75.360(f).
75.360(f)	Partly new, 75.360(g).
75.360(g)	Partly new, 75.360(h).
75.362(a)(1)	Partly new, 75.362(a)(1).
75.362(a)(2)	New.
75.362(c)(1)	Partly new, 75.362(c)(1).
75.362(c)(2)	75.362(c)(2).
75.362(d)(1)(i)	New.
75.362(d)(1)(iii)	Partly new, 75.362(d)(1)(ii).
75.362(d)(2)	Partly new, 75.362(d)(2).
75.362(g)(1)	New.
75.362(g)(2)	New.
75.363	Partly new, 75.313, 75.361, 75.362.
75.364(a)(1)	Partly new, 75.364(a)(1).
75.364(a)(2)(i)	Partly new, 75.364(a)(2)(i).
75.364(a)(2)(ii)	Partly new, 75.364(a)(2)(ii).
75.364(a)(2)(iii)	Partly new, 75.364(a)(2)(iii).
75.364(a)(2)(iv)	Partly new, 75.364(a)(2)(iii).
75.364(h)	Partly new, 75.364(h).
75.364(i)	Partly new, 75.364(i).
75.370(a)(3)	Partly new, 75.370(a)(3).
75.370(a)(3)(i)	New.
75.370(a)(3)(ii)	75.370(a)(3).
75.370(a)(3)(iii)	Partly new, 75.370(a)(3).
75.370(b)	New.
75.370(c)(1)	Partly new, 75.370(b)(1).
75.370(c)(2)	75.370(b)(2).
75.370(f)	Partly new, 75.370(e).
75.370(f)(1)	New.
75.370(f)(2)	Partly new, 75.370(e).
75.370(f)(3)	Partly new, 75.370(e).
75.371(r)	Partly new, 75.371(r).
75.371(s)	Partly new, 75.371(s).
75.371(z)	Partly new, 75.371(z).
75.371(bb)	Partly new, 75.371(bb).
75.371(cc)	Partly new, 75.371(cc).
75.372(b)(3)	Partly new, 75.372(b)(3).
75.372(b)(19)	New.
75.372(b)(20)	New.
75.380(b)(1)	75.380(b)(1).
75.380(b)(2)	75.380(b)(2).
75.380(d)(3)	Partly new, 75.380(d)(3).
75.380(d)(4)(ii)	Partly new, 75.380(d)(4)(ii).
75.380(d)(4)(iii)	New.
75.380(d)(4)(iv)	New.
75.380(d)(5)	Partly new, 75.380(d)(5).
75.380(f)	Partly new, 75.380(f)(1).
75.380(f)(1)	Partly new, 75.380(f)(1).
75.380(f)(2)	Partly new, 75.380(f)(1).

New section	Old section
75.380(f)(3)	Partly new, 75.380(f)(1).
75.380(f)(4)	Partly new, 75.380(f)(2).
75.380(f)(5)	Partly new, 75.380(f)(2).
75.380(f)(6)	New.
75.380(f)(7)	New.
75.380(i)(2)	Partly new, 75.380(i)(2).
75.382(g)	New.
75.383(a)	Partly new, 75.383(a).
75.383(b)(1)	75.383(b)(1).
75.388(c)	Partly new, 75.388(c).
75.389(c)	New.
75.389(c)(1)	75.389(c)(1).

Redesignation Table

The following redesignation table lists the section number of the existing standard and the section number of the final standard which contain revised provisions derived from the corresponding existing section.

Old section	New section
75.310(a)(3)	75.310(a)(3).
75.310(a)(4)	75.310(a)(4).
75.310(c)	75.310(c).
75.310(c)	75.310(c)(1).
75.310(c)	75.310(c)(2).
75.310(c)	75.310(c)(4).
75.310(c)(1)	75.310(c)(4)(i).
75.310(c)(2)	75.310(c)(4)(ii).
75.311(d)	75.311(d).
75.312(a)	75.312(a).
75.312(b)(1)	75.312(b)(1), 75.312(b)(1)(ii).
75.312(b)(1)(i)	75.312(b)(1)(ii)(A).
75.312(b)(1)(ii)	75.312(b)(1)(ii)(B).
75.312(c)	75.312(c).
75.312(d)	75.312(d).
75.312(f)	75.312(f)(1).
75.312(g)(1)	75.312(g)(1).
75.312(g)(3)	75.312(g)(3).
75.312(h)	75.312(h).
75.313(c)(2)	75.313(c)(2).
75.313(c)(3)	75.313(c)(3).
75.313(d)(1)(i)	75.313(d)(1)(i).
75.313(d)(1)(ii)	75.313(d)(1)(ii).
75.321(a)	75.321(a)(1).
75.321(a)	75.321(a)(2).
75.323(b)(1)(ii)	75.323(b)(1)(ii).
75.323(c)(1)	75.323(c)(1).
75.323(d)(2)(i)	75.323(d)(2)(i).
75.325(d)	75.325(d).
75.333(a)	75.333(a).
75.333(b)(1)	75.333(b)(1).
75.333(b)(3)	75.333(b)(3).
75.333(b)(4)	75.333(b)(4).
75.333(e)(1)	75.333(e)(1)(i).
75.333(e)(1)	75.333(e)(1)(ii).
75.334(e)	75.334(e).
75.334(f)(3)	75.334(f)(3).
75.340(a)	75.340(a)
75.340(a)(1)	75.340(a)(1)(i).
75.340(a)(2)	75.340(a)(1)(ii).
75.340(a)(3)	75.340(a)(1)(iii).
75.340(a)(3)(i)	75.340(a)(1)(iii)(A).
75.340(a)(3)(ii)	75.340(a)(1)(iii)(B).
75.340(a)	75.340(a)(2).
75.340(a)(1)	75.340(a)(2)(i).
75.340(a)(2)	75.340(a)(2)(ii).
75.342(a)(4)	75.342(a)(4).
75.344(a)	75.344(a).
75.344(a)(1)	75.344(a)(2).
75.344(a)(2)	75.344(b).
75.344(b)(1)	75.344(a)(1).
75.344(b)(2)	75.344(a)(2).
75.344(b)(2)(i)	75.344(a)(2)(i).

Old section	New section
75.344(b)(2)(ii)	75.344(a)(2)(ii).
75.360(a)	75.360(a)(1).
75.360(b)	75.360(b).
75.360(b)(1)	75.360(b)(1).
75.360(b)(3)	75.360(b)(3).
75.360(b)(4)	75.350(b)(4).
75.360(b)(6)	75.360(b)(6)(i).
75.360(b)(6)	75.360(b)(6)(ii).
75.360(c)	75.360(c).
75.360(c)(1)	75.360(c)(1).
75.360(c)(3	75.360(c)(3).
75.360(e)	75.363.
75.360(f)	75.360(e).
75.360(g)	75.360(f).
75.360(h)	75.360(g).
75.362(a)(1)	75.362(a)(1).
75.363(a)(2)	75.363.
75.362(c)(1)	75.362(c)(1).
75.362(d)(1)(i)	75.362(d)(1)(ii).
75.362(d)(1)(ii)	75.362(d)(1)(iii).
75.362(d)(2)	75.362(d)(2).
75.362(g)	75.363.
75.362(h)	75.363.
75.364(a)(1)	75.364(a)(1).
75.364(a)(2)(i)	75.364(a)(2)(i).
75.364(a)(2)(ii)	75.364(a)(2)(ii).
75.364(a)(2)(iii)	75.364(a)(2)(iii).
75.364(h)	75.364(h).
75.364(i)	75.364(i).
75.370(a)(3)	75.370(a)(3).
75.370(a)(3)	75.370(a)(3)(ii).
75.370(a)(3)	75.370(a)(3)(iii).
75.370(b)(1)	75.370(c)(1).
75.370(b)(2)	75.370(c)(2).
75.370(e)	75.370(f).
75.370(e)	75.370(f)(2).
75.370(e)	75.370(f)(3).
75.371(r)	75.371(r).
75.371(s)	75.371(s).
75.371(z)	75.371(z).
75.371(bb)	75.371(bb).
75.371(cc)	75.371(cc).
75.372(b)(3)	75.372(b)(3).
75.380(d)(3)	75.380(d)(3).
75.380(d)(4)(ii)	75.380(d)(4)(ii).
75.380(d)(5)	75.380(d)(5).
75.380(f)	75.380(f).
75.380(i)(2)	75.380(i)(2).
75.383(a)	75.383(a).
75.388(c)	75.388(c).
75.389(c)(1)	75.389(c)(1).

III. Paperwork Reduction Act

The information collection requirements contained in this rule have been submitted to the Office of Management and Budget (OMB) for review under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3520), as implemented by OMB in regulations at 5 CFR part 1320. No person may be required to respond to, or may be subjected to a penalty for failure to comply with, these information collection requirements until they have been approved and MSHA has announced the assigned OMB control number. The OMB control number, when assigned, will be announced by separate notice in the Federal Register. In accordance with § 1320.11(h) of the implementing regulations, OMB has 60 days from today's publication date in which to approve, disapprove, or instruct MSHA to make a change to the information collection requirements in this rule.

This final rule addresses comments submitted to OMB and MSHA on the collection of information requirements in the proposed rule. In revising the requirements from those that appeared in the proposed rule, MSHA has evaluated the necessity and usefulness of the collections of information; reevaluated MSHA's estimate of the information collection burden, including the validity of the underlying methodology and assumptions; and minimized the burden on respondents for the information collection requirements, to the extent possible. This final rule provides for the use of electronic storage and maintenance of records.

Benefits

In assessing costs and benefits of the ventilation rule, it is important to note that ventilation of underground coal mines is the primary method of preventing the accumulation of explosive methane gas, controlling harmful respirable dust, and assuring the quality of air miners breath. Because

of the potential for a large number of fatalities resulting from ventilation problems, MSHA has found it prudent to establish multiple safety factors and safety work practices to better assure adequate protection for miners. It is extremely difficult to specifically quantify safety benefits related to each safety factor. However, due to the close, confined nature of the workplace in an underground coal mine, failure of any safety factors or protective actions related to ventilation can have disastrous effects. The introduction of this rule lists some of those tragic mine accidents. In the restricted work environment of an underground coal mine, failure of a single safety factor or noncompliance with a safe work practice could jeopardize the well-being of all miners underground. The total effect of the provisions in this final rule in conjunction with MSHA's existing ventilation standards should decrease the occurrence of fatalities, injuries, accidents, and illnesses in underground coal mines.

With respect to this final rule, the Agency has identified nine fatalities and seven injuries which potentially could have been prevented by compliance with these provisions. In addition, the final rule contains provisions to better assure compliance with the respirable dust control parameters specified in the mine ventilation plan. Adherence to these parameters helps to maintain a work environment free of excessive levels of respirable dust, thereby improving long-term health protection for miners and potentially reducing the number of miners afflicted with coal workers' pneumoconiosis.

Some provisions clarify the intent of the existing rule. Such clarifications should increase the likelihood of compliance and thereby will help to increase the probability of preventing a fatality, injury, or non-injury accident. For the provisions which offer an alternative compliance option, the miners will be provided at least the same level of safety provided by an existing requirement. These provisions will facilitate compliance by the operator, thereby increasing the potential for the rule to reduce the probability of a ventilation-related explosion or accident.

In conclusion, the Agency determined that these provisions will increase the probability that compliance with the ventilation rule will prevent future ventilation-related accidents and generate a safer mining environment.

Compliance Costs and Economic Impact

MSHA has compared the costs associated with the existing requirements with the costs of the new requirements. Based upon the available data, MSHA estimates that compliance with the rule will produce net total per year costs of approximately $4.0 million for the mining industry. This $4.0 million is composed of approximately $0.6 million in net annualized costs (derived from $4.0 million one-time costs) and approximately $3.4 million net annual recurring costs.

With respect to large underground coal mines the net total per year costs will be approximately $3.0 million. This $3.0 million is composed of approximately $0.46 million in net annualized costs (derived from $3.0 million one-time costs) and approximately $2.54 million net annual recurring costs.

With respect to small underground coal mines the net total per year costs will be approximately $1.0 million. This $1.0 million is composed of approximately $0.14 million in net annualized costs (derived from $1.0 million one-time costs) and approximately $0.82 million net annual recurring costs.

Executive Order 12866 requires that regulatory agencies assess the impact to the government for any regulation determined to be a significant regulatory action. MSHA does not believe that this rule will create any significant cost impacts to the government. The regulation can be implemented under existing government practices without any substantial equipment or facility expenditures by the government.

The incremental compliance costs for all underground coal mines are listed by provision in Table I.

TABLE IV–1.—COMPLIANCE COSTS TO COMPLY WITH THE VENTILATION RULE FOR ALL UNDERGROUND COAL MINES

[In thousands of dollars]

Standard	First year costs	Annualized costs	Annual costs
75.301	(100)	(7)	(20)
75.310	329	47	(70)
75.311	.....	.....	.....
75.312	.....	.....	(1,121)
75.313	.....	.....	322
75.320	.....	.....	.....
75.321	250	35	40
75.323	.....	.....	.....
75.330	.....	.....	.....
75.333	.....	.....	.....
75.334	.....	.....	.....
75.340	63	9	
75.342	12	2	38
75.344	57	10	1,256
75.360	123	17	(1,556)
75.362	420	59	3,275
75.363	.....	.....	321
75.364	.....	.....	682
75.370	.....	.....	67
75.371	.....	.....	13
75.372	.....	.....	.....
75.380	2,839	436	51
75.382	.....	.....	13
75.388	.....	.....	53

TABLE IV–1.—COMPLIANCE COSTS TO COMPLY WITH THE VENTILATION RULE FOR ALL UNDERGROUND COAL MINES—Continued

[In thousands of dollars]

Standard	First year costs	Annualized costs	Annual costs
75.389.			
Total costs	3,993	608	3,364

Regulatory Flexibility Certification

The Regulatory Flexibility Act requires that agencies evaluate and include, wherever possible, compliance alternatives that minimize any adverse impact on small businesses when developing regulatory standards. MSHA has not exempted small mines from any provision of the rule and small mines will benefit from some of the provisions and the alternative compliance methods.

MSHA determined that these revisions will not generate a substantial cost increase for small mines. The lack of a substantial cost increase for small mines, in conjunction with the fact that similar hazards exist in both large and small mining operations, indicates that regulatory relief is not warranted for small mining operations. Therefore, MSHA has determined that these provisions will not have a significantly adverse impact upon a substantial number of small entities.

The incremental costs for small and large mines are listed by provision in Table II.

TABLE IV–2.—COMPLIANCE COSTS TO COMPLY WITH THE VENTILATION RULE FOR SMALL AND LARGE UNDERGROUND COAL MINES

[In thousands of dollars]

Standard	First year costs		Annualized costs		Annual costs	
	Small	Large	Small	Large	Small	Large
75.301		(100)		(7)		(20)
75.310	273	56	39	8	(78)	8
75.311						
75.312						(1,121)
75.313					55	267
75.320						
75.321		250		35		40
75.323						
75.330						
75.333						
75.334						
75.340	4	59	1	8		
75.342	6	6	1	1	18	20
75.344		57		10	43	1,213
75.360	37	86	5	12	100	(1,656)
75.362	80	340	11	48	409	2,866
75.363					98	223
75.364					126	556
75.370					12	55
75.371					6	7
75.372						
75.380	585	2,254	89	347	6	45
75.382						13
75.388					25	28
75.389						
Total	985	3,008	146	462	820	2,544

List of Subjects in 30 CFR Part 75

Escapeways, Mine safety and health, Underground coal mines, Ventilation.

Dated: March 4, 1996.

J. Davitt McAteer,

Assistant Secretary for Mine Safety and Health.

Accordingly, part 75, subchapter O, chapter I, title 30 of the Code of Federal Regulations is amended as follows:

PART 75—MANDATORY SAFETY STANDARDS—UNDERGROUND COAL MINES

1. The authority citation for part 75 is revised to read as follows:

Authority: 30 U.S.C. 811.

2. Subpart D of part 75 is revised to read as follows:

Subpart D—Ventilation

§ 75.300 Scope.

This subpart sets requirements for underground coal mine ventilation.

§ 75.301 Definitions.

In addition to the applicable definitions in § 75.2, the following definitions apply in this subpart.

Air course. An entry or a set of entries separated from other entries by stoppings, overcasts, other ventilation control devices, or by solid blocks of coal or rock so that any mixing of air currents between each is limited to leakage.

Incombustible. Incapable of being burned.

Intake air. Air that has not yet ventilated the last working place on any split of any working section, or any worked-out area, whether pillared or nonpillared.

Intrinsically safe. Incapable of releasing enough electrical or thermal energy under normal or abnormal conditions to cause ignition of a flammable mixture of methane or natural gas and air of the most easily ignitable composition.

Noncombustible Structure or Area. Describes a structure or area that will continue to provide protection against flame spread for at least 1 hour when subjected to a fire test incorporating an ASTM E119–88 time/temperature heat input, or equivalent.

Noncombustible Material. Describes a material which when used to construct a ventilation control results in a control that will continue to serve its intended function for 1 hour when subjected to a fire test incorporating an ASTM E119–88 time/temperature heat input, or equivalent.

Return air. Air that has ventilated the last working place on any split of any working section or any worked-out area whether pillared or nonpillared. If air mixes with air that has ventilated the last working place on any split of any working section or any worked-out area, whether pillared or nonpillared, it is considered return air. For the purposes of § 75.507–1, air that has been used to ventilate any working place in a coal producing section or pillared area, or air that has been used to ventilate any working face if such air is directed away from the immediate return is return air. Notwithstanding the definition of intake air, for the purpose of ventilation of structures, areas or installations that are required by this subpart D to be ventilated to return air courses, and for ventilation of seals, other air courses may be designated as return air courses by the operator only when the air in these air courses will not be used to ventilate working places or other locations, structures, installations or areas required to be ventilated with intake air.

Worked-out area. An area where mining has been completed, whether pillared or nonpillared, excluding developing entries, return air courses, and intake air courses.

§ 75.302 Main mine fans.

Each coal mine shall be ventilated by one or more main mine fans. Booster fans shall not be installed underground to assist main mine fans except in anthracite mines. In anthracite mines, booster fans installed in the main air current or a split of the main air current may be used provided their use is approved in the ventilation plan.

§ 75.310 Installation of main mine fans.

(a) Each main mine fan shall be—

(1) Installed on the surface in an incombustible housing;

(2) Connected to the mine opening with incombustible air ducts;

(3) Equipped with an automatic device that gives a signal at the mine when the fan either slows or stops. A responsible person designated by the operator shall always be at a surface location at the mine where the signal can be seen or heard while anyone is underground. This person shall be provided with two-way communication with the working sections and work stations where persons are routinely assigned to work for the majority of a shift;

(4) Equipped with a pressure recording device or system. Mines permitted to shut down main mine fans under § 75.311 and which do not have a pressure recording device installed on main mine fans shall have until March 11, 1997 to install a pressure recording device or system on all main mine fans. If a device or system other than a circular pressure recorder is used to monitor main mine fan pressure, the monitoring device or system shall provide a continuous graph or continuous chart of the pressure as a function of time. At not more than 7-day intervals, a hard copy of the continuous graph or chart shall be generated or the record of the fan pressure shall be stored electronically. When records of fan pressure are stored electronically, the system used to store these records shall be secure and not susceptible to alteration and shall be capable of storing the required data. Records of the fan pressure shall be retained at a surface location at the mine for at least 1 year and be made available for inspection by authorized representatives of the Secretary and the representative of miners;

(5) Protected by one or more weak walls or explosion doors, or a combination of weak walls and explosion doors, located in direct line with possible explosive forces;

(6) Except as provided under paragraph (e) of this section, offset by at least 15 feet from the nearest side of the mine opening unless an alternative method of protecting the fan and its associated components is approved in the ventilation plan.

(b)(1) If an electric motor is used to drive a main mine fan, the motor shall operate from a power circuit independent of all mine power circuits.

(2) If an internal combustion engine is used to drive a main mine fan—

(i) The fuel supply shall be protected against fires and explosions;

(ii) The engine shall be installed in an incombustible housing and be equipped with a remote shut-down device;

(iii) The engine and the engine exhaust system shall be located out of direct line of the air current exhausting from the mine; and

(iv) The engine exhaust shall be vented to the atmosphere so that the exhaust gases do not contaminate the mine intake air current or any enclosure.

(c) If a main mine fan monitoring system is used under § 75.312, the system shall—

(1) Record, as described in paragraph (a)(4) the mine ventilating pressure;

(2) Monitor bearing temperature, revolutions per minute, vibration, electric voltage, and amperage;

(3) Provide a printout of the monitored parameters, including the mine ventilating pressure within a reasonable period, not to exceed the end of the next scheduled shift during which miners are underground; and

(4) Be equipped with an automatic device that signals when—

(i) An electrical or mechanical deficiency exists in the monitoring system; or

(ii) A sudden increase or loss in mine ventilating pressure occurs.

(5) Provide monitoring, records, printouts, and signals required by paragraphs (c)(1) through (c)(4) at a surface location at the mine where a responsible person designated by the operator is always on duty and where signals from the monitoring system can be seen or heard while anyone is underground. This person shall be provided with two-way communication with the working sections and work stations where persons are routinely assigned to work for the majority of a shift.

(d) Weak walls and explosion doors shall have cross-sectional areas at least equal to that of the entry through which the pressure from an explosion underground would be relieved. A weak wall and explosion door combination shall have a total cross-sectional area at least equal to that of the entry through which the pressure from an explosion underground would be relieved.

(e) If a mine fan is installed in line with an entry, a slope, or a shaft—

(1) The cross-sectional area of the pressure relief entry shall be at least equal to that of the fan entry;

(2) The fan entry shall be developed out of direct line with possible explosive forces;

(3) The coal or other solid material between the pressure relief entry and the fan entry shall be at least 2,500 square feet; and

(4) The surface opening of the pressure relief entry shall be not less than 15 feet nor more than 100 feet from the surface opening of the fan entry and from the underground intersection of the fan entry and pressure relief entry.

(f) In mines ventilated by multiple main mine fans, incombustible doors shall be installed so that if any main mine fan stops and air reversals through the fan are possible, the doors on the affected fan automatically close.

§ 75.311 Main mine fan operation.

(a) Main mine fans shall be continuously operated, except as otherwise approved in the ventilation plan, or when intentionally stopped for testing of automatic closing doors and automatic fan signal devices, maintenance or adjustment of the fan, or to perform maintenance or repair work underground that cannot otherwise be made while the fan is operating.

(b) Except as provided in paragraph (c) of this section, when a main mine fan is intentionally stopped and the ventilating quantity provided by the fan is not maintained by a back-up fan system—

(1) Only persons necessary to evaluate the effect of the fan stoppage or restart, or to perform maintenance or repair work that cannot otherwise be made while the fan is operating, shall be permitted underground;

(2) Mechanized equipment shall be shut off before stopping the fan; and

(3) Electric power circuits entering underground areas of the mine shall be deenergized.

(c) When a back-up fan system is used that does not provide the ventilating quantity provided by the main mine fan, persons may be permitted in the mine and electric power circuits may be energized as specified in the approved ventilation plan.

(d) If an unusual variance in the mine ventilation pressure is observed, or if an electrical or mechanical deficiency of a main mine fan is detected, the mine foreman or equivalent mine official, or in the absence of the mine foreman or equivalent mine official, a designated certified person acting for the mine foreman or equivalent mine official shall be notified immediately, and appropriate action or repairs shall be instituted promptly.

(e) While persons are underground, a responsible person designated by the operator shall always be at a surface location where each main mine fan signal can be seen or heard.

(f) The area within 100 feet of main mine fans and intake air openings shall be kept free of combustible material, unless alternative precautions necessary to provide protection from fire or other products of combustion are approved in the ventilation plan.

(g) If multiple mine fans are used, the mine ventilation system shall be designed and maintained to eliminate areas without air movement.

(h) Any atmospheric monitoring system operated during fan stoppages shall be intrinsically safe.

§ 75.312 Main mine fan examinations and records.

(a) To assure electrical and mechanical reliability of main mine fans, each main mine fan and its associated components, including devices for measuring or recording mine ventilation pressure, shall be examined for proper operation by a trained person designated by the operator. Examinations of main mine fans shall be made at least once each day that the fan operates, unless a fan monitoring system is used. No examination is required on any day when no one, including certified persons, goes underground, except that an examination shall be completed prior to anyone entering the mine.

(b)(1) If a main mine fan monitoring system is used, a trained person designated by the operator shall—

(i) At least once each day review the data provided by the fan monitoring system to assure that the fan and the fan monitoring system are operating properly. No review is required on any day when no one, including certified persons, goes underground, except that a review of the data shall be performed prior to anyone entering the underground portion of the mine. Data reviewed should include the fan pressure, bearing temperature, revolutions per minute, vibration, electric voltage, and amperage; and

(ii) At least every 7 days—

(A) Test the monitoring system for proper operation; and

(B) Examine each main mine fan and its associated components to assure electrical and mechanical reliability of main mine fans.

(2) If the monitoring system malfunctions, the malfunction shall be corrected, or paragraph (a) of this section shall apply.

(c) At least every 31 days, the automatic fan signal device for each main mine fan shall be tested by stopping the fan. Only persons

necessary to evaluate the effect of the fan stoppage or restart, or to perform maintenance or repair work that cannot otherwise be made while the fan is operating, shall be permitted underground. Notwithstanding the requirement of § 75.311(b)(3), underground power may remain energized during this test provided no one, including persons identified in § 75.311(b)(1), is underground. If the fan is not restarted within 15 minutes, underground power shall be deenergized and no one shall enter any underground area of the mine until the fan is restarted and an examination of the mine is conducted as described in § 75.360 (b) through (e) and the mine has been determined to be safe.

(d) At least every 31 days, the automatic closing doors in multiple main mine fan systems shall be tested by stopping the fan. Only persons necessary to evaluate the effect of the fan stoppage or restart, or to perform maintenance or repair work that cannot otherwise be made while the fan is operating, shall be permitted underground. Notwithstanding the provisions of § 75.311, underground power may remain energized during this test provided no one, including persons identified in § 75.311(b)(1), is underground. If the fan is not restarted within 15 minutes, underground power shall be deenergized and no one shall enter any underground area of the mine, until the fan is restarted and an examination of the mine is conducted as described in § 75.360 (b) through (e) and the mine has been determined to be safe.

(e) Circular main mine fan pressure recording charts shall be changed before the beginning of a second revolution.

(f)(1) *Certification.* Persons making main mine fan examinations shall certify by initials and date at the fan or another location specified by the operator that the examinations were made. Each certification shall identify the main mine fan examined.

(2) Persons reviewing data produced by a main mine fan monitoring system shall certify by initials and date on a printed copy of the data from the system that the review was completed. In lieu of certification on a copy of the data, the person reviewing the data may certify electronically that the review was completed. Electronic certification shall be by handwritten initials and date in a computer system so as to be secure and not susceptible to alteration.

(g)(1) *Recordkeeping.* By the end of the shift on which the examination is made, persons making main mine fan examinations shall record all uncorrected defects that may affect the operation of the fan that are not corrected by the end of that shift. Records shall be maintained in a secure book that is not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration.

(2) When a fan monitoring system is used in lieu of the daily fan examination—

(i) The certified copies of data produced by fan monitoring systems shall be maintained separate from other computer-generated reports or data; and

(ii) A record shall be made of any fan monitoring system malfunctions, electrical or mechanical deficiencies in the monitoring system and any sudden increase or loss in mine ventilating pressure. The record shall be made by the end of the shift on which the review of the data is completed and shall be maintained in a secure book that is not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration.

(3) By the end of the shift on which the monthly test of the automatic fan signal device or the automatic closing doors is completed, persons making these tests shall record the results of the tests. Records shall be maintained in a secure book that is not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration.

(h) *Retention period.* Records, including records of mine fan pressure and the certified copies of data produced by fan monitoring systems, shall be retained at a surface location at the mine for at least 1 year and shall be made available for inspection by authorized representatives of the Secretary and the representative of miners.

§ 75.313 Main mine fan stoppage with persons underground.

(a) If a main mine fan stops while anyone is underground and the ventilating quantity provided by the fan is not maintained by a back-up fan system—

(1) Electrically powered equipment in each working section shall be deenergized;

(2) Other mechanized equipment in each working section shall be shut off; and

(3) Everyone shall be withdrawn from the working sections and areas where mechanized mining equipment is being installed or removed.

(b) If ventilation is restored within 15 minutes after a main mine fan stops, certified persons shall examine for methane in the working places and in other areas where methane is likely to accumulate before work is resumed and before equipment is energized or restarted in these areas.

(c) If ventilation is not restored within 15 minutes after a main mine fan stops—

(1) Everyone shall be withdrawn from the mine;

(2) Underground electric power circuits shall be deenergized. However, circuits necessary to withdraw persons from the mine need not be deenergized if located in areas or haulageways where methane is not likely to migrate to or accumulate. These circuits shall be deenergized as persons are withdrawn; and

(3) Mechanized equipment not located on working sections shall be shut off. However, mechanized equipment necessary to withdraw persons from the mine need not be shut off if located in areas where methane is not likely to migrate to or accumulate.

(d)(1) When ventilation is restored—

(i) No one other than designated certified examiners shall enter any underground area of the mine until an examination is conducted as described in § 75.360(b) through (e) and the area has been determined to be safe. Designated certified examiners shall enter the underground area of the mine from which miners have been withdrawn only after the fan has operated for at least 15 minutes unless a longer period of time is specified in the approved ventilation plan.

(ii) Underground power circuits shall not be energized and nonpermissible mechanized equipment shall not be started or operated in an area until an examination is conducted as described in § 75.360(b) through (e) and the area has been determined to be safe, except that designated certified examiners may use nonpermissible transportation equipment in intake airways to facilitate the making of the required examination.

(2) If ventilation is restored to the mine before miners reach the surface, the miners may return to underground working areas only after an examination of the areas is made by a certified person and the areas are determined to be safe.

(e) Any atmospheric monitoring system operated during fan stoppages shall be intrinsically safe.

§ 75.320 Air quality detectors and measurement devices.

(a) Tests for methane shall be made by a qualified person with MSHA approved detectors that are maintained in permissible and proper operating condition and calibrated with a known

methane-air mixture at least once every 31 days.

(b) Tests for oxygen deficiency shall be made by a qualified person with MSHA approved oxygen detectors that are maintained in permissible and proper operating condition and that can detect 19.5 percent oxygen with an accuracy of ±0.5 percent. The oxygen detectors shall be calibrated at the start of each shift that the detectors will be used.

(c) Handheld devices that contain electrical components and that are used for measuring air velocity, carbon monoxide, oxides of nitrogen, and other gases shall be approved and maintained in permissible and proper operating condition.

(d) An oxygen detector approved by MSHA shall be used to make tests for oxygen deficiency required by the regulations in this part. Permissible flame safety lamps may only be used as a supplementary testing device.

(e) Maintenance of instruments required by paragraphs (a) through (d) of this section shall be done by persons trained in such maintenance.

§ 75.321 Air quality.

(a)(1) The air in areas where persons work or travel, except as specified in paragraph (a)(2) of this section, shall contain at least 19.5 percent oxygen and not more than 0.5 percent carbon dioxide, and the volume and velocity of the air current in these areas shall be sufficient to dilute, render harmless, and carry away flammable, explosive, noxious, and harmful gases, dusts, smoke, and fumes.

(2) The air in areas of bleeder entries and worked-out areas where persons work or travel shall contain at least 19.5 percent oxygen, and carbon dioxide levels shall not exceed 0.5 percent time weighted average and 3.0 percent short term exposure limit.

(b) Notwithstanding the provisions of § 75.322, for the purpose of preventing explosions from gases other than methane, the following gases shall not be permitted to accumulate in excess of the concentrations listed below:

(1) Carbon monoxide (CO)—2.5 percent

(2) Hydrogen (H_2)—.80 percent

(3) Hydrogen sulfide (H_2S)—.80 percent

(4) Acetylene (C_2H_2)—.40 percent

(5) Propane (C_3H_8)—.40 percent

(6) MAPP (methyl-acetylene-propylene-propodiene)—.30 percent

§ 75.322 Harmful quantities of noxious gases.

Concentrations of noxious or poisonous gases, other than carbon dioxide, shall not exceed the current threshold limit values (TLV) as specified and applied by the ACGIH. Detectors or laboratory analysis of mine air samples shall be used to determine the concentrations of harmful, noxious, or poisonous gases.

§ 75.323 Actions for excessive methane.

(a) *Location of tests.* Tests for methane concentrations under this section shall be made at least 12 inches from the roof, face, ribs, and floor.

(b) *Working places and intake air courses.*

(1) When 1.0 percent or more methane is present in a working place or an intake air course, including an air course in which a belt conveyor is located, or in an area where mechanized mining equipment is being installed or removed—

(i) Except intrinsically safe atmospheric monitoring systems (AMS), electrically powered equipment in the affected area shall be deenergized, and other mechanized equipment shall be shut off;

(ii) Changes or adjustments shall be made at once to the ventilation system to reduce the concentration of methane to less than 1.0 percent; and

(iii) No other work shall be permitted in the affected area until the methane concentration is less than 1.0 percent.

(2) When 1.5 percent or more methane is present in a working place or an intake air course, including an air course in which a belt conveyor is located, or in an area where mechanized mining equipment is being installed or removed—

(i) Everyone except those persons referred to in § 104(c) of the Act shall be withdrawn from the affected area; and

(ii) Except for intrinsically safe AMS, electrically powered equipment in the affected area shall be disconnected at the power source.

(c) *Return air split.* (1) When 1.0 percent or more methane is present in a return air split between the last working place on a working section and where that split of air meets another split of air, or the location at which the split is used to ventilate seals or worked-out areas changes or adjustments shall be made at once to the ventilation system to reduce the concentration of methane in the return air to less than 1.0 percent.

(2) When 1.5 percent or more methane is present in a return air split between the last working place on a working section and where that split of air meets another split of air, or the location where the split is used to ventilate seals or worked-out areas—

(i) Everyone except those persons referred to in § 104(c) of the Act shall be withdrawn from the affected area;

(ii) Other than intrinsically safe AMS, equipment in the affected area shall be deenergized, electric power shall be disconnected at the power source, and other mechanized equipment shall be shut off; and

(iii) No other work shall be permitted in the affected area until the methane concentration in the return air is less than 1.0 percent.

(d) *Return air split alternative.* (1) The provisions of this paragraph apply if—

(i) The quantity of air in the split ventilating the active workings is at least 27,000 cubic feet per minute in the last open crosscut or the quantity specified in the approved ventilation plan, whichever is greater;

(ii) The methane content of the air in the split is continuously monitored during mining operations by an AMS that gives a visual and audible signal on the working section when the methane in the return air reaches 1.5 percent, and the methane content is monitored as specified in § 75.351; and

(iii) Rock dust is continuously applied with a mechanical duster to the return air course during coal production at a location in the air course immediately outby the most inby monitoring point.

(2) When 1.5 percent or more methane is present in a return air split between a point in the return opposite the section loading point and where that split of air meets another split of air or where the split of air is used to ventilate seals or worked-out areas—

(i) Changes or adjustments shall be made at once to the ventilation system to reduce the concentration of methane in the return air below 1.5 percent;

(ii) Everyone except those persons referred to in § 104(c) of the Act shall be withdrawn from the affected area;

(iii) Except for intrinsically safe AMS, equipment in the affected area shall be deenergized, electric power shall be disconnected at the power source, and other mechanized equipment shall be shut off; and

(iv) No other work shall be permitted in the affected area until the methane concentration in the return air is less than 1.5 percent.

(e) *Bleeders and other return air courses.* The concentration of methane in a bleeder split of air immediately before the air in the split joins another split of air, or in a return air course other than as described in paragraphs (c) and (d) of this section, shall not exceed 2.0 percent.

§ 75.324 Intentional changes in the ventilation system.

(a) A person designated by the operator shall supervise any intentional change in ventilation that—

(1) Alters the main air current or any split of the main air current in a manner that could materially affect the safety or health of persons in the mine; or

(2) Affects section ventilation by 9,000 cubic feet per minute of air or more in bituminous or lignite mines, or 5,000 cubic feet per minute of air or more in anthracite mines.

(b) Intentional changes shall be made only under the following conditions:

(1) Electric power shall be removed from areas affected by the ventilation change and mechanized equipment in those areas shall be shut off before the ventilation change begins.

(2) Only persons making the change in ventilation shall be in the mine.

(3) Electric power shall not be restored to the areas affected by the ventilation change and mechanized equipment shall not be restarted until a certified person has examined these areas for methane accumulation and for oxygen deficiency and has determined that the areas are safe.

§ 75.325 Air quantity.

(a)(1) In bituminous and lignite mines the quantity of air shall be at least 3,000 cubic feet per minute reaching each working face where coal is being cut, mined, drilled for blasting, or loaded. When a greater quantity is necessary to dilute, render harmless, and carry away flammable, explosive, noxious, and harmful gases, dusts, smoke, and fumes, this quantity shall be specified in the approved ventilation plan. A minimum air quantity may be required to be specified in the approved ventilation plan for other working places or working faces.

(2) The quantity of air reaching the working face shall be determined at or near the face end of the line curtain, ventilation tubing, or other ventilation control device. If the curtain, tubing, or device extends beyond the last row of permanent roof supports, the quantity of air reaching the working face shall be determined behind the line curtain or in the ventilation tubing at or near the last row of permanent supports.

(3) If machine mounted dust collectors or diffuser fans are used, the approved ventilation plan shall specify the operating volume of the dust collector or diffuser fan.

(b) In bituminous and lignite mines, the quantity of air reaching the last open crosscut of each set of entries or rooms on each working section and the quantity of air reaching the intake end of a pillar line shall be at least 9,000 cubic feet per minute unless a greater quantity is required to be specified in the approved ventilation plan.

(c) In longwall and shortwall mining systems—

(1) The quantity of air shall be at least 30,000 cubic feet per minute reaching the working face of each longwall, unless the operator demonstrates that a lesser air quantity will maintain continual compliance with applicable methane and respirable dust standards. This lesser quantity shall be specified in the approved ventilation plan. A quantity greater than 30,000 cubic feet per minute may be required to be specified in the approved ventilation plan.

(2) The velocity of air that will be provided to control methane and respirable dust below applicable standards on each longwall or shortwall and the locations where these velocities will be provided shall be specified in the approved ventilation plan. The locations specified shall be at least 50 feet but no more than 100 feet from the headgate and tailgate, respectively.

(d) Ventilation shall be maintained during installation and removal of mechanized mining equipment. The approved ventilation plan shall specify the minimum quantity of air, the locations where this quantity will be provided and the ventilation controls required.

(e) In anthracite mines, the quantity of air shall be as follows:

(1) At least 1,500 cubic feet per minute reaching each working face where coal is being mined, unless a greater quantity is required to be specified in the approved ventilation plan.

(2) At least 5,000 cubic feet per minute passing through the last open crosscut in each set of entries or rooms and at the intake end of any pillar line, unless a greater quantity is required to be specified in the approved ventilation plan.

(3) When robbing areas where air currents cannot be controlled and air measurements cannot be obtained, the air shall have perceptible movement.

§ 75.326 Mean entry air velocity.

In exhausting face ventilation systems, the mean entry air velocity shall be at least 60 feet per minute reaching each working face where coal is being cut, mined, drilled for blasting, or loaded, and to any other working places as required in the approved ventilation plan. A lower mean entry air velocity may be approved in the ventilation plan if the lower velocity will maintain methane and respirable dust concentrations below the applicable levels. Mean entry air velocity shall be determined at or near the inby end of the line curtain, ventilation tubing, or other face ventilation control devices.

§ 75.327 Air courses and trolley haulage systems.

(a) In any mine opened on or after March 30, 1970, or in any new working section of a mine opened before that date, where trolley haulage systems are maintained and where trolley wires or trolley feeder wires are installed, an authorized representative of the Secretary shall require enough entries or rooms as intake air courses to limit the velocity of air currents in the haulageways to minimize the hazards of fires and dust explosions in the haulageways.

(b) Unless the district manager approves a higher velocity, the velocity of the air current in the trolley haulage entries shall be limited to not more than 250 feet per minute. A higher air velocity may be required to limit the methane content in these haulage entries or elsewhere in the mine to less than 1.0 percent and provide an adequate supply of oxygen.

§ 75.330 Face ventilation control devices.

(a) Brattice cloth, ventilation tubing and other face ventilation control devices shall be made of flame-resistant material approved by MSHA.

(b)(1) Ventilation control devices shall be used to provide ventilation to dilute, render harmless, and to carry away flammable, explosive, noxious, and harmful gases, dusts, smoke, and fumes—

(i) To each working face from which coal is being cut, mined, drilled for blasting, or loaded; and

(ii) To any other working places as required by the approved ventilation plan.

(2) These devices shall be installed at a distance no greater than 10 feet from the area of deepest penetration to which any portion of the face has been advanced unless an alternative distance is specified and approved in the ventilation plan. Alternative distances specified shall be capable of maintaining concentrations of respirable dust, methane, and other harmful gases below the levels specified in the applicable sections of this chapter.

(c) When the line brattice or any other face ventilation control device is damaged to an extent that ventilation of the working face is inadequate, production activities in the working place shall cease until necessary repairs

are made and adequate ventilation is restored.

§ 75.331 Auxiliary fans and tubing.

(a) When auxiliary fans and tubing are used for face ventilation, each auxiliary fan shall be—

(1) Permissible, if the fan is electrically operated;

(2) Maintained in proper operating condition;

(3) Deenergized or shut off when no one is present on the working section; and

(4) Located and operated to avoid recirculation of air.

(b) If a deficiency exists in any auxiliary fan system, the deficiency shall be corrected or the auxiliary fan shall be deenergized immediately.

(c) If the air passing through an auxiliary fan or tubing contains 1.0 percent or more methane, power to electrical equipment in the working place and to the auxiliary fan shall be deenergized, and other mechanized equipment in the working place shall be shut off until the methane concentration is reduced to less than 1.0 percent.

(d) When an auxiliary fan is stopped—

(1) Line brattice or other face ventilation control devices shall be used to maintain ventilation to affected faces; and

(2) Electrical equipment in the affected working places shall be disconnected at the power source, and other mechanized equipment shall be shut off until ventilation to the working place is restored.

§ 75.332 Working sections and working places.

(a)(1) Each working section and each area where mechanized mining equipment is being installed or removed, shall be ventilated by a separate split of intake air directed by overcasts, undercasts or other permanent ventilation controls.

(2) When two or more sets of mining equipment are simultaneously engaged in cutting, mining, or loading coal or rock from working places within the same working section, each set of mining equipment shall be on a separate split of intake air.

(3) For purposes of this section, a set of mining equipment includes a single loading machine, a single continuous mining machine, or a single longwall or shortwall mining machine.

(b)(1) Air that has passed through any area that is not examined under §§ 75.360, 75.361 or 75.364 of this subpart, or through an area where second mining has been done shall not be used to ventilate any working place. Second mining is intentional retreat mining where pillars have been wholly or partially removed, regardless of the amount of recovery obtained.

(2) Air that has passed by any opening of any unsealed area that is not examined under §§ 75.360, 75.361 or 75.364 of this subpart, shall not be used to ventilate any working place.

§ 75.333 Ventilation controls.

(a) For purposes of this section, ''doors'' include any door frames.

(b) Permanent stoppings or other permanent ventilation control devices constructed after November 15, 1992, shall be built and maintained—

(1) Between intake and return air courses, except temporary controls may be used in rooms that are 600 feet or less from the centerline of the entry from which the room was developed including where continuous face haulage systems are used in such rooms. Unless otherwise approved in the ventilation plan, these stoppings or controls shall be maintained to and including the third connecting crosscut outby the working face;

(2) To separate belt conveyor haulageways from return air courses, except where belt entries in areas of mines developed before March 30, 1970, are used as return air courses;

(3) To separate belt conveyor haulageways from intake air courses when the air in the intake air courses is used to provide air to active working places. Temporary ventilation controls may be used in rooms that are 600 feet or less from the centerline of the entry from which the rooms were developed including where continuous face haulage systems are used in such rooms. When continuous face haulage systems are used, permanent stoppings or other permanent ventilation control devices shall be built and maintained to the outby most point of travel of the dolly or 600 feet from the point of deepest penetration in the conveyor belt entry, whichever distance is closer to the point of deepest penetration, to separate the continuous haulage entry from the intake entries;

(4) To separate the primary escapeway from belt and trolley haulage entries, as required by § 75.380(g). For the purposes of § 75.380(g), the loading point for a continuous haulage system shall be the outby most point of travel of the dolly or 600 feet from the point of deepest penetration, whichever distance is less; and

(5) In return air courses to direct air into adjacent worked-out areas.

(c) Personnel doors shall be constructed of noncombustible material and shall be of sufficient strength to serve their intended purpose of maintaining separation and permitting travel between air courses, and shall be installed as follows in permanent stoppings constructed after November 15, 1992:

(1) The distance between personnel doors shall be no more than 300 feet in seam heights below 48 inches and 600 feet in seam heights 48 inches or higher.

(2) The location of all personnel doors in stoppings along escapeways shall be clearly marked so that the doors may be easily identified by anyone traveling in the escapeway and in the entries on either side of the doors.

(3) When not in use, personnel doors shall be closed.

(d) Doors, other than personnel doors, constructed after November 15, 1992, that are used in lieu of permanent stoppings or to control ventilation within an air course shall be:

(1) Made of noncombustible material or coated on all accessible surfaces with flame-retardant material having a flame-spread index of 25 or less, as tested under ASTM E162–87.

(2) Of sufficient strength to serve their intended purpose of maintaining separation and permitting travel between or within air courses or entries.

(3) Installed in pairs to form an airlock. When an airlock is used, one side of the airlock shall remain closed. When not in use, both sides shall be closed.

(e)(1)(i) Except as provided in paragraphs (e)(2), (e)(3) and (e)(4) of this section all overcasts, undercasts, shaft partitions, permanent stoppings, and regulators, installed after March 11, 1997, shall be constructed in a traditionally accepted method and of materials that have been demonstrated to perform adequately or in a method and of materials that have been tested and shown to have a minimum strength equal to or greater than the traditionally accepted in-mine controls. Tests may be performed under ASTM E72–80 Section 12—Transverse Load-Specimen Vertical, load only, or the operator may conduct comparative in-mine tests. In-mine tests shall be designed to demonstrate the comparative strength of the proposed construction and a traditionally accepted in-mine control.

(ii) All overcasts, undercasts, shaft partitions, permanent stoppings, and regulators, installed after November 15, 1992, shall be constructed of noncombustible material. Materials that are suitable for the construction of overcasts, undercasts, shaft partitions, permanent stoppings, and regulators include concrete, concrete block, brick, cinder block, tile, or steel. No ventilation controls installed after

November 15, 1992, shall be constructed of aluminum.

(2) In anthracite mines, permanent stoppings may be constructed of overlapping layers of hardwood mine boards, if the stoppings are a minimum 2 inches thick.

(3) When timbers are used to create permanent stoppings in heaving or caving areas, the stoppings shall be coated on all accessible surfaces with a flame-retardant material having a flame-spread index of 25 or less, as tested under ASTM E162–87, ''Surface Flammability of Materials Using a Radiant Heat Energy Source.''

(4) In anthracite mines, doors and regulators may be constructed of overlapping layers of hardwood boards, if the doors, door frames, and regulators are a minimum 2 inches thick.

(f) When sealants are applied to ventilation controls, the sealant shall have a flame-spread index of 25 or less under ASTM E162–87.

(g) Before mining is discontinued in an entry or room that is advanced more than 20 feet from the inby rib, a crosscut shall be made or line brattice shall be installed and maintained to provide adequate ventilation. When conditions such as methane liberation warrant a distance less than 20 feet, the approved ventilation plan shall specify the location of such rooms or entries and the maximum distance they will be developed before a crosscut is made or line brattice is installed.

(h) All permanent ventilation controls, including seals, shall be maintained to serve the purpose for which they were built.

§ 75.334 Worked-out areas and areas where pillars are being recovered.

(a) Worked-out areas where no pillars have been recovered shall be—

(1) Ventilated so that methane-air mixtures and other gases, dusts, and fumes from throughout the worked-out areas are continuously diluted and routed into a return air course or to the surface of the mine; or

(2) Sealed.

(b)(1) During pillar recovery a bleeder system shall be used to control the air passing through the area and to continuously dilute and move methane-air mixtures and other gases, dusts, and fumes from the worked-out area away from active workings and into a return air course or to the surface of the mine.

(2) After pillar recovery a bleeder system shall be maintained to provide ventilation to the worked-out area, or the area shall be sealed.

(c) The approved ventilation plan shall specify the following:

(1) The design and use of bleeder systems;

(2) The means to determine the effectiveness of bleeder systems;

(3) The means for adequately maintaining bleeder entries free of obstructions such as roof falls and standing water; and

(4) The location of ventilating devices such as regulators, stoppings and bleeder connectors used to control air movement through the worked-out area.

(d) If the bleeder system used does not continuously dilute and move methane-air mixtures and other gases, dusts, and fumes away from worked-out areas into a return air course or to the surface of the mine, or it cannot be determined by examinations or evaluations under § 75.364 that the bleeder system is working effectively, the worked-out area shall be sealed.

(e) Each mining system shall be designed so that each worked-out area can be sealed. The approved ventilation plan shall specify the location and the sequence of construction of proposed seals.

(f) In place of the requirements of paragraphs (a) and (b) of this section, for mines with a demonstrated history of spontaneous combustion, or that are located in a coal seam determined to be susceptible to spontaneous combustion, the approved ventilation plan shall specify the following:

(1) Measures to detect methane, carbon monoxide, and oxygen concentrations during and after pillar recovery, and in worked-out areas where no pillars have been recovered, to determine if the areas must be ventilated or sealed.

(2) Actions that will be taken to protect miners from the hazards of spontaneous combustion.

(3) If a bleeder system will not be used, the methods that will be used to control spontaneous combustion, accumulations of methane-air mixtures, and other gases, dusts, and fumes in the worked-out area.

§ 75.335 Construction of seals.

(a)(1) Each seal constructed after November 15, 1992, shall be—

(i) Constructed of solid concrete blocks at least 6 by 8 by 16 inches, laid in a transverse pattern with mortar between all joints;

(ii) Hitched into solid ribs to a depth of at least 4 inches and hitched at least 4 inches into the floor;

(iii) At least 16 inches thick. When the thickness of the seal is less than 24 inches and the width is greater than 16 feet or the height is greater than 10 feet, a pilaster shall be interlocked near the center of the seal. The pilaster shall be at least 16 inches by 32 inches; and

(iv) Coated on all accessible surfaces with flame-retardant material that will minimize leakage and that has a flame-spread index of 25 or less, as tested under ASTM E162–87, ''Surface Flammability of Materials Using a Radiant Heat Energy Source.''

(2) Alternative methods or materials may be used to create a seal if they can withstand a static horizontal pressure of 20 pounds per square inch provided the method of installation and the material used approved in the ventilation plan. If the alternative methods or materials include the use of timbers, the timbers also shall be coated on all accessible surfaces with flame-retardant material having a flame-spread index 25 or less, as tested under ASTM E162–87.

(b) A sampling pipe or pipes shall be installed in each set of seals for a worked-out area. Each pipe shall—

(1) Extend into the sealed area a sufficient distance (at least 15 feet) to obtain a representative sample from behind the seal;

(2) Be equipped with a cap or shut-off valve; and

(3) Be installed with the sampling end of the pipe about 12 inches from the roof.

(c)(1) A corrosion-resistant water pipe or pipes shall be installed in seals at the low points of the area being sealed and at all other locations necessary when water accumulation within the sealed area is possible; and

(2) Each water pipe shall have a water trap installed on the outby side of the seal.

§ 75.340 Underground electrical installations.

(a) Underground transformer stations, battery charging stations, substations, rectifiers, and water pumps shall be housed in noncombustible structures or areas or be equipped with a fire suppression system meeting the requirements of § 75.1107–3 through § 75.1107–16.

(1) When a noncombustible structure or area is used, these installations shall be—

(i) Ventilated with intake air that is coursed into a return air course or to the surface and that is not used to ventilate working places; or

(ii) Ventilated with intake air that is monitored for carbon monoxide or smoke by an AMS installed and operated according to § 75.351. Monitoring of intake air ventilating battery charging stations shall be done with sensors not affected by hydrogen; or

(iii) Ventilated with intake air and equipped with sensors to monitor for heat and for carbon monoxide or smoke. Monitoring of intake air ventilating battery charging stations shall be done

with sensors not affected by hydrogen. The sensors shall deenergize power to the installation, activate a visual and audible alarm located outside of and on the intake side of the enclosure, and activate doors that will automatically close when either of the following occurs:

(A) The temperature in the noncombustible structure reaches 165 °F; or

(B) The carbon monoxide concentration reaches 10 parts per million above the ambient level for the area, or the optical density of smoke reaches 0.022 per meter. At least every 31 days, sensors installed to monitor for carbon monoxide shall be calibrated with a known concentration of carbon monoxide and air sufficient to activate the closing door, or each smoke sensor shall be tested to determine that it functions correctly.

(2) When a fire suppression system is used, these installations shall be—

(i) Ventilated with intake air that is coursed into a return air course or to the surface and that is not used to ventilate working places; or

(ii) Ventilated with intake air that is monitored for carbon monoxide or smoke by an AMS installed and operated according to § 75.351. Monitoring of intake air ventilating battery charging stations shall be done with sensors not affected by hydrogen.

(b) This section does not apply to—

(1) Rectifiers and power centers with transformers that are either dry-type or contain nonflammable liquid, if they are located at or near the section and are moved as the working section advances or retreats;

(2) Submersible pumps;

(3) Permissible pumps and associated permissible switchgear;

(4) Pumps located on or near the section and that are moved as the working section advances or retreats;

(5) Pumps installed in anthracite mines; and

(6) Small portable pumps.

§ 75.341 Direct-fired intake air heaters.

(a) If any system used to heat intake air malfunctions, the heaters affected shall switch off automatically.

(b) Thermal overload devices shall protect the blower motor from overheating.

(c) The fuel supply shall turn off automatically if a flame-out occurs.

(d) Each heater shall be located or guarded to prevent contact by persons and shall be equipped with a screen at the inlet to prevent combustible materials from passing over the burner units.

(e) If intake air heaters use liquefied fuel systems—

(1) Hydrostatic relief valves installed on vaporizers and on storage tanks shall be vented; and

(2) Fuel storage tanks shall be located or protected to prevent fuel from leaking into the mine.

(f) Following any period of 8 hours or more during which a heater does not operate, the heater and its associated components shall be examined within its first hour of operation. Additionally, each heater and its components shall be examined at least once each shift that the heater operates. The examination shall include measurement of the carbon monoxide concentration at the bottom of each shaft, slope, or in the drift opening where air is being heated. The measurements shall be taken by a person designated by the operator or by a carbon monoxide sensor that is calibrated with a known concentration of carbon monoxide and air at least once every 31 days. When the carbon monoxide concentration at this location reaches 50 parts per million, the heater causing the elevated carbon monoxide level shall be shut down.

§ 75.342 Methane monitors.

(a)(1) MSHA approved methane monitors shall be installed on all face cutting machines, continuous miners, longwall face equipment, loading machines, and other mechanized equipment used to extract or load coal within the working place.

(2) The sensing device for methane monitors on longwall shearing machines shall be installed at the return air end of the longwall face. An additional sensing device also shall be installed on the longwall shearing machine, downwind and as close to the cutting head as practicable. An alternative location or locations for the sensing device required on the longwall shearing machine may be approved in the ventilation plan.

(3) The sensing devices of methane monitors shall be installed as close to the working face as practicable.

(4) Methane monitors shall be maintained in permissible and proper operating condition and shall be calibrated with a known air-methane mixture at least once every 31 days. To assure that methane monitors are properly maintained and calibrated, the operator shall:

(i) Use persons properly trained in the maintenance, calibration, and permissibility of methane monitors to calibrate and maintain the devices.

(ii) Maintain a record of all calibration tests of methane monitors. Records shall be maintained in a secure book that is not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration.

(iii) Retain the record of calibration tests for 1 year from the date of the test. Records shall be retained at a surface location at the mine and made available for inspection by authorized representatives of the Secretary and the representative of miners.

(b)(1) When the methane concentration at any methane monitor reaches 1.0 percent the monitor shall give a warning signal.

(2) The warning signal device of the methane monitor shall be visible to a person who can deenergize the equipment on which the monitor is mounted.

(c) The methane monitor shall automatically deenergize the machine on which it is mounted when—

(1) The methane concentration at any methane monitor reaches 2.0 percent; or

(2) The monitor is not operating properly.

§ 75.343 Underground shops.

(a) Underground shops shall be equipped with an automatic fire suppression system meeting the requirements of § 75.1107–3 through § 75.1107–16, or be enclosed in a noncombustible structure or area.

(b) Underground shops shall be ventilated with intake air that is coursed directly into a return air course.

§ 75.344 Compressors.

(a) Except compressors that are components of equipment such as locomotives and rock dusting machines and compressors of less than 5 horsepower, electrical compressors including those that may start automatically shall be:

(1) Continuously attended by a person designated by the operator who can see the compressor at all times during its operation. Any designated person attending the compressor shall be capable of activating the fire suppression system and deenergizing or shutting-off the compressor in the event of a fire; or,

(2) Enclosed in a noncombustible structure or area which is ventilated by intake air coursed directly into a return air course or to the surface and equipped with sensors to monitor for heat and for carbon monoxide or smoke. The sensors shall deenergize power to the compressor, activate a visual and audible alarm located outside of and on the intake side of the enclosure, and activate doors to automatically enclose the noncombustible structure or area when either of the following occurs:

(i) The temperature in the noncombustible structure or area reaches 165 °F.

(ii) The carbon monoxide concentration reaches 10 parts per million above the ambient level for the area, or the optical density of smoke reaches 0.022 per meter. At least once every 31 days, sensors installed to monitor for carbon monoxide shall be calibrated with a known concentration of carbon monoxide and air sufficient to activate the closing door, and each smoke sensor shall be tested to determine that it functions correctly.

(b) Compressors, except those exempted in paragraph (a), shall be equipped with a heat activated fire suppression system meeting the requirements of 75.1107–3 through 75.1107–16.

(c) Two portable fire extinguishers or one extinguisher having at least twice the minimum capacity specified for a portable fire extinguisher in § 75.1100–1(e) shall be provided for each compressor.

(d) In addition to electrical compressors, this section shall apply to diesel compressors.

(e) Notwithstanding the requirements of § 75.1107–4, upon activation of any fire suppression system used under paragraph (b) of this section, the compressor shall be automatically deenergized or automatically shut off.

§ 75.350 Air courses and belt haulage entries.

In any coal mine opened after March 30, 1970, the entries used as intake and return air courses shall be separated from belt haulage entries, and each operator of such mine shall limit the velocity of the air coursed through belt haulage entries to the amount necessary to provide an adequate supply of oxygen in such entries, and to insure that the air therein shall contain less than 1.0 volume per centum of methane, and such air shall not be used to ventilate active working places. Whenever an authorized representative of the Secretary finds, in the case of any coal mine opened on or prior to March 30, 1970, that has been developed with more than two entries, that the conditions in the entries, other than belt haulage entries, are such as to permit adequately the coursing of intake or return air through such entries:

(a) The belt haulage entries shall not be used to ventilate, unless such entries are necessary to ventilate, active working places, and

(b) When the belt haulage entries are not necessary to ventilate the active working places, the operator of such mine shall limit the velocity of the air coursed through the belt haulage entries to the amount necessary to provide an adequate supply of oxygen in such entries, and to assure that air therein shall contain less than 1.0 volume per centum of methane.

§ 75.351 Atmospheric monitoring system (AMS).

(a) *Minimum requirements.* An AMS shall consist of sensors to monitor the mine atmosphere and instruments at a surface location designated by the operator to receive information from the monitoring sensors. Each AMS installed in accordance with §§ 75.323(d)(1)(ii), 75.340(a)(2) and 75.362(f) shall do the following:

(1) Monitor for circuit continuity and sensor function, and identify at the designated surface location any activated or malfunctioning sensor.

(2) Signal a designated surface location at the mine when any interruption of circuit continuity occurs or any sensor malfunctions.

(3) Signal affected working sections and the designated surface location when—

(i) The carbon monoxide concentration at any carbon monoxide sensor reaches 5 parts per million above the established ambient level for that area; or

(ii) The methane concentration at any methane monitoring station exceeds the maximum allowable concentration as specified for that location in § 75.323.

(4) Activate alarms at a designated surface location and affected working sections when the carbon monoxide concentration at any carbon monoxide sensor reaches 10 parts per million above the established ambient level for the area or when the optical density of smoke at any smoke sensor reaches 0.05 per meter.

(b) *Return splits.* (1) If used to monitor return air splits under § 75.362(f), AMS sensors shall monitor the mine atmosphere for percentage of methane in each return split of air from each working section between the last working place, or longwall or shortwall face, ventilated by that air split and the junction of that return air split with another air split, seal, or worked-out area. If auxiliary fans and tubing are used, the sensor also shall be located outby the auxiliary fan discharge.

(2) If used to monitor air splits under § 75.323(d)(1)(ii), AMS sensors shall monitor the mine atmosphere at the following locations:

(i) In the return air course opposite the section loading point or, if auxiliary fans and tubing are used, in the return air course outby the auxiliary fans and a point opposite the section loading point.

(ii) Immediately inby the location where the split of air meets another split of air, or inby the location where the split of air is used to ventilate seals or worked-out areas.

(c) *Electrical installations.* If used to monitor the intake air ventilating underground transformer stations, battery charging stations, substations, rectifiers, or water pumps under § 75.340(a)(2), at least one sensor shall be installed to monitor the mine atmosphere for carbon monoxide or smoke at least 50 feet and no more than 100 feet downstream in the direction of air flow.

(d) *Signals and alarms.* (1) A person designated by the operator shall be at a surface location where the signals and alarms from the AMS can always be seen or heard while anyone is underground. This person shall have access to two-way communication with working sections and with other identifiable duty stations underground. A mine map showing the underground monitoring system shall be posted at the surface location.

(2) If a signal from any AMS sensor is activated, the monitor producing the signal shall be identified, an examination shall be made to determine the cause of the activation, and appropriate action shall be taken.

(e) *Sensors.* (1) Each carbon monoxide sensor shall be capable of detecting carbon monoxide in air at a level of ±1 part per million throughout the operating range.

(2) Each methane sensor shall be capable of detecting 1.0 percent methane in air with an accuracy of ±0.2 percent methane.

(3) Each smoke sensor shall be capable of detecting the optical density of smoke with an accuracy of ±0.005 per meter.

(f) *Testing and calibration.* At least once every 31 days—

(1) Each carbon monoxide sensor shall be calibrated with a known concentration of carbon monoxide and air sufficient to activate an alarm;

(2) Each smoke sensor shall be functionally tested;

(3) Each methane sensor shall be calibrated with a known methane-air mixture; and

(4) Each oxygen sensor shall be calibrated with air having a known oxygen concentration.

(g) *Intrinsic Safety.* Components of AMS installed in areas where permissible equipment is required shall be intrinsically safe.

(h) *Recordkeeping.* If a signal device or alarm is activated, a record shall be made of the date, time, type of sensor, and the reason for its activation. Also the maximum concentration detected at

the sensor producing the signal shall be recorded.

(i) Retention period. Records shall be retained for at least 1 year at a surface location at the mine and made available for inspection by authorized representatives of the Secretary and representatives of miners.

§ 75.352 Return air courses.

Entries used as return air courses shall be separated from belt haulage entries by permanent ventilation controls.

§ 75.360 Preshift examination.

(a)(1) Except as provided in paragraph (a)(2) of this section, a certified person designated by the operator shall make a preshift examination within 3 hours preceding the beginning of any 8-hour interval during which any person is scheduled to work or travel underground. The operator shall establish the 8-hour intervals of time subject to the required preshift examinations. No person other than certified examiners may enter or remain in any underground area unless a preshift examination has been completed for the established 8-hour period.

(2) Preshift examinations of areas where pumpers are scheduled to work or travel shall not be required prior to the pumper entering the areas if the pumper is a certified person and the pumper conducts an examination for hazardous conditions, tests for methane and oxygen deficiency and determines if the air is moving in its proper direction in the area where the pumper works or travels. The examination of the area must be completed before the pumper performs any other work. A record of all hazardous conditions found by the pumper shall be made and retained in accordance with § 75.363.

(b) The person conducting the preshift examination shall examine for hazardous conditions, test for methane and oxygen deficiency, and determine if the air is moving in its proper direction at the following locations:

(1) Roadways, travelways and track haulageways where persons are scheduled, prior to the beginning of the preshift examination, to work or travel during the oncoming shift.

(2) Belt conveyors that will be used to transport persons during the oncoming shift and the entries in which these belt conveyors are located.

(3) Working sections and areas where mechanized mining equipment is being installed or removed, if anyone is scheduled to work on the section or in the area during the oncoming shift. The scope of the examination shall include the working places, approaches to worked-out areas and ventilation controls on these sections and in these areas, and the examination shall include tests of the roof, face and rib conditions on these sections and in these areas.

(4) Approaches to worked-out areas along intake air courses and at the entries used to carry air into worked-out areas if the intake air passing the approaches is used to ventilate working sections where anyone is scheduled to work during the oncoming shift. The examination of the approaches to the worked-out areas shall be made in the intake air course immediately inby and outby each entry used to carry air into the worked-out area. An examination of the entries used to carry air into the worked-out areas shall be conducted at a point immediately inby the intersection of each entry with the intake air course.

(5) Seals along intake air courses where intake air passes by a seal to ventilate working sections where anyone is scheduled to work during the oncoming shift.

(6)(i) Entries and rooms developed after November 15, 1992, and developed more than 2 crosscuts off an intake air course without permanent ventilation controls where intake air passes through or by these entries or rooms to reach a working section where anyone is scheduled to work during the oncoming shift; and,

(ii) Entries and rooms developed after November 15, 1992, and driven more than 20 feet off an intake air course without a crosscut and without permanent ventilation controls where intake air passes through or by these entries or rooms to reach a working section where anyone is scheduled to work during the oncoming shift.

(7) Where unattended diesel equipment is to operate or areas where trolley wires or trolley feeder wires are to be or will remain energized during the oncoming shift.

(8) High spots along intake air courses where methane is likely to accumulate, if equipment will be operated in the area during the shift.

(9) Underground electrical installations referred to in § 75.340(a), except those pumps listed in § 75.340 (b)(2) through (b)(6), and areas where compressors subject to § 75.344 are installed if the electrical installation or compressor is or will be energized during the shift.

(10) Other areas where work or travel during the oncoming shift is scheduled prior to the beginning of the preshift examination.

(c) The person conducting the preshift examination shall determine the volume of air entering each of the following areas if anyone is scheduled to work in the areas during the oncoming shift:

(1) In the last open crosscut of each set of entries or rooms on each working section and areas where mechanized mining equipment is being installed or removed. The last open crosscut is the crosscut in the line of pillars containing the permanent stoppings that separate the intake air courses and the return air courses.

(2) On each longwall or shortwall in the intake entry or entries at the intake end of the longwall or shortwall face immediately outby the face and the velocity of air at each end of the face at the locations specified in the approved ventilation plan.

(3) At the intake end of any pillar line—

(i) If a single split of air is used, in the intake entry furthest from the return air course, immediately outby the first open crosscut outby the line of pillars being mined; or

(ii) If a split system is used, in the intake entries of each split immediately inby the split point.

(d) The district manager may require the certified person to examine other areas of the mine or examine for other hazards during the preshift examination.

(e) *Certification.* At each working place examined, the person doing the preshift examination shall certify by initials, date, and the time, that the examination was made. In areas required to be examined outby a working section, the certified person shall certify by initials, date, and the time at enough locations to show that the entire area has been examined.

(f) *Recordkeeping.* A record of the results of each preshift examination, including a record of hazardous conditions and their locations found by the examiner during each examination and of the results and locations of air and methane measurements, shall be made on the surface before any persons, other than certified persons conducting examinations required by this subpart, enter any underground area of the mine. The results of methane tests shall be recorded as the percentage of methane measured by the examiner. The record shall be made by the certified person who made the examination or by a person designated by the operator. If the record is made by someone other than the examiner, the examiner shall verify the record by initials and date by or at the end of the shift for which the examination was made. A record shall also be made by a certified person of the action taken to correct hazardous conditions found during the preshift

examination. All preshift and corrective action records 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 records required by this section shall be made in a secure book that is not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration.

(g) *Retention period.* Records shall be retained at a surface location at the mine for at least 1 year and shall be made available for inspection by authorized representatives of the Secretary and the representative of miners.

§ 75.361 Supplemental examination.

(a) Except for certified persons conducting examinations required by this subpart, within 3 hours before anyone enters an area in which a preshift examination has not been made for that shift, a certified person shall examine the area for hazardous conditions, determine whether the air is traveling in its proper direction and at its normal volume, and test for methane and oxygen deficiency.

(b) *Certification.* At each working place examined, the person making the supplemental examination shall certify by initials, date, and the time, that the examination was made. In areas required to be examined outby a working section, the certified person shall certify by initials, date, and the time at enough locations to show that the entire area has been examined.

§ 75.362 On-shift examination.

(a) (1) At least once during each shift, or more often if necessary for safety, a certified person designated by the operator shall conduct an on-shift examination of each section where anyone is assigned to work during the shift and any area where mechanized mining equipment is being installed or removed during the shift. The certified person shall check for hazardous conditions, test for methane and oxygen deficiency, and determine if the air is moving in its proper direction.

(2) A person designated by the operator shall conduct an examination to assure compliance with the respirable dust control parameters specified in the mine ventilation plan. In those instances when a shift change is accomplished without an interruption in production on a section, the examination shall be made anytime within 1 hour of the shift change. In those instances when there is an interruption in production during the shift change, the examination shall be made before production begins on a section. Deficiencies in dust controls shall be corrected before production begins or resumes. The examination shall include air quantities and velocities, water pressures and flow rates, excessive leakage in the water delivery system, water spray numbers and orientations, section ventilation and control device placement, and any other dust suppression measures required by the ventilation plan. Additional measurements of the air velocity and quantity, water pressure and flow rates are not required if continuous monitoring of these controls is used and indicates that the dust controls are functioning properly.

(b) During each shift that coal is produced, a certified person shall examine for hazardous conditions along each belt conveyor haulageway where a belt conveyor is operated. This examination may be conducted at the same time as the preshift examination of belt conveyors and belt conveyor haulageways, if the examination is conducted within 3 hours before the oncoming shift.

(c) Persons conducting the on-shift examination shall determine at the following locations:

(1) The volume of air in the last open crosscut of each set of entries or rooms on each section and areas where mechanized mining equipment is being installed or removed. The last open crosscut is the crosscut in the line of pillars containing the permanent stoppings that separate the intake air courses and the return air courses.

(2) The volume of air on a longwall or shortwall, including areas where longwall or shortwall equipment is being installed or removed, in the intake entry or entries at the intake end of the longwall or shortwall.

(3) The velocity of air at each end of the longwall or shortwall face at the locations specified in the approved ventilation plan.

(4) The volume of air at the intake end of any pillar line—

(i) Where a single split of air is used in the intake entry furthest from the return air course immediately outby the first open crosscut outby the line of pillars being mined; or

(ii) Where a split system is used in the intake entries of each split immediately inby the split point.

(d) (1) A qualified person shall make tests for methane—

(i) At the start of each shift at each working place before electrically operated equipment is energized; and

(ii) Immediately before equipment is energized, taken into, or operated in a working place; and

(iii) At 20-minute intervals, or more often if required in the approved ventilation plan at specific locations, during the operation of equipment in the working place.

(2) These methane tests shall be made at the face from under permanent roof support, using extendable probes or other acceptable means. When longwall or shortwall mining systems are used, these methane tests shall be made at the shearer, the plow, or the cutting head. When mining has been stopped for more than 20 minutes, methane tests shall be conducted prior to the start up of equipment.

(e) If auxiliary fans and tubing are used, they shall be inspected frequently.

(f) During each shift that coal is produced and at intervals not exceeding 4 hours, tests for methane shall be made by a certified person or by an atmospheric monitoring system (AMS) in each return split of air from each working section between the last working place, or longwall or shortwall face, ventilated by that split of air and the junction of the return air split with another air split, seal, or worked-out area. If auxiliary fans and tubing are used, the tests shall be made at a location outby the auxiliary fan discharge.

(g) *Certification.* (1) The person conducting the on-shift examination in belt haulage entries shall certify by initials, date, and time that the examination was made. The certified person shall certify by initials, date, and the time at enough locations to show that the entire area has been examined.

(2) The person directing the on-shift examination to assure compliance with the respirable dust control parameters specified in the mine ventilation plan shall certify by initials, date, and time that the examination was made.

§ 75.363 Hazardous conditions; posting, correcting and recording.

(a) Any hazardous condition found by the mine foreman or equivalent mine official, assistant mine foreman or equivalent mine official, or other certified persons designated by the operator for the purposes of conducting examinations under this subpart D, shall be posted with a conspicuous danger sign where anyone entering the areas would pass. A hazardous condition, other than one detected during a preshift examination or an examination conducted following a fan stoppage and restart under § 75.313(d)(1)(i), shall be corrected immediately or the area shall remain posted until the hazardous condition is corrected. If the condition creates an imminent danger, everyone except those persons referred to in

section 104(c) of the Act shall be withdrawn from the area affected to a safe area until the hazardous condition is corrected. Only persons designated by the operator to correct or evaluate the condition may enter the posted area.

(b) A record shall be made of any hazardous condition found. This record shall be kept in a book maintained for this purpose on the surface at the mine. The record shall be made by the completion of the shift on which the hazardous condition is found and shall include the nature and location of the hazardous condition and the corrective action taken. This record shall not be required for shifts when no hazardous conditions are found or for hazardous conditions found during the preshift or weekly examinations inasmuch as these examinations have separate recordkeeping requirements.

(c) The record shall be made by the certified person who conducted the examination or a person designated by the operator. If made by a person other than the certified person, the certified person shall verify the record by initials and date by or at the end of the shift for which the examination was made. Records 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 made in a secure book that is not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration.

(d) *Retention period*. Records shall be retained at a surface location at the mine for at least 1 year and shall be made available for inspection by authorized representatives of the Secretary and the representative of miners.

§ 75.364 Weekly examination.

(a) *Worked-out areas*. (1) At least every 7 days, a certified person shall examine unsealed worked-out areas where no pillars have been recovered by traveling to the area of deepest penetration; measuring methane and oxygen concentrations and air quantities and making tests to determine if the air is moving in the proper direction in the area. The locations of measurement points where tests and measurements will be performed shall be included in the mine ventilation plan and shall be adequate in number and location to assure ventilation and air quality in the area. Air quantity measurements shall also be made where the air enters and leaves the worked-out area. An alternative method of evaluating the ventilation of the area may be approved in the ventilation plan.

(2) At least every 7 days, a certified person shall evaluate the effectiveness of bleeder systems required by § 75.334 as follows:

(i) Measurements of methane and oxygen concentrations and air quantity and a test to determine if the air is moving in its proper direction shall be made where air enters the worked-out area.

(ii) Measurements of methane and oxygen concentrations and air quantity and a test to determine if the air is moving in the proper direction shall be made immediately before the air enters a return split of air.

(iii) At least one entry of each set of bleeder entries used as part of a bleeder system under § 75.334 shall be traveled in its entirety. Measurements of methane and oxygen concentrations and air quantities and a test to determine if the air is moving in the proper direction shall be made at the measurement point locations specified in the mine ventilation plan to determine the effectiveness of the bleeder system.

(iv) In lieu of the requirements of paragraphs (a)(2)(i) and (iii) of this section, an alternative method of evaluation may be specified in the ventilation plan provided the alternative method results in proper evaluation of the effectiveness of the bleeder system.

(b) *Hazardous conditions*. At least every 7 days, an examination for hazardous conditions at the following locations shall be made by a certified person designated by the operator:

(1) In at least one entry of each intake air course, in its entirety, so that the entire air course is traveled.

(2) In at least one entry of each return air course, in its entirety, so that the entire air course is traveled.

(3) In each longwall or shortwall travelway in its entirety, so that the entire travelway is traveled.

(4) At each seal along return and bleeder air courses and at each seal along intake air courses not examined under § 75.360(b)(5).

(5) In each escapeway so that the entire escapeway is traveled.

(6) On each working section not examined under § 75.360(b)(3) during the previous 7 days.

(7) At each water pump not examined during a preshift examination conducted during the previous 7 days.

(c) *Measurements and tests*. At least every 7 days, a certified person shall—

(1) Determine the volume of air entering the main intakes and in each intake split;

(2) Determine the volume of air and test for methane in the last open crosscut in any pair or set of developing entries or rooms, in the return of each split of air immediately before it enters the main returns, and where the air leaves the main returns; and

(3) Test for methane in the return entry nearest each set of seals immediately after the air passes the seals.

(d) Hazardous conditions shall be corrected immediately. If the condition creates an imminent danger, everyone except those persons referred to in § 104(c) of the Act shall be withdrawn from the area affected to a safe area until the hazardous condition is corrected.

(e) The weekly examination may be conducted at the same time as the preshift or on-shift examinations.

(f) (1) The weekly examination is not required during any 7 day period in which no one enters any underground area of the mine.

(2) Except for certified persons required to make examinations, no one shall enter any underground area of the mine if a weekly examination has not been completed within the previous 7 days.

(g) *Certification*. The person making the weekly examinations shall certify by initials, date, and the time that the examination was made. Certifications and times shall appear at enough locations to show that the entire area has been examined.

(h) *Recordkeeping*. At the completion of any shift during which a portion of a weekly examination is conducted, a record of the results of each weekly examination, including a record of hazardous conditions found during each examination and their locations, the corrective action taken, and the results and location of air and methane measurements, shall be made. The results of methane tests shall be recorded as the percentage of methane measured by the examiner. The record shall be made by the person making the examination or a person designated by the operator. If made by a person other than the examiner, the examiner shall verify the record by the initials and date by or at the end of the shift for which the examination was made. 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 records required by this section shall be made in a secure book that is not susceptible to alteration or electronically in a computer system so as to be secure and not susceptible to alteration.

(i) *Retention period*. Records shall be retained at a surface location at the mine for at least 1 year and shall be made available for inspection by authorized

representatives of the Secretary and the representative of miners.

§ 75.370 Mine ventilation plan; submission and approval.

(a) (1) The operator shall develop and follow a ventilation plan approved by the district manager. The plan shall be designed to control methane and respirable dust and shall be suitable to the conditions and mining system at the mine. The ventilation plan shall consist of two parts, the plan content as prescribed in § 75.371 and the ventilation map with information as prescribed in § 75.372. Only that portion of the map which contains information required under § 75.371 will be subject to approval by the district manager.

(2) The proposed ventilation plan and any revision to the plan shall be submitted in writing to the district manager. When revisions to a ventilation plan are proposed, only the revised pages, maps, or sketches of the plan need to be submitted. When required in writing by the district manager, the operator shall submit a fully revised plan by consolidating the plan and all revisions in an orderly manner and by deleting all outdated material.

(3) (i) The mine operator shall notify the representative of miners at least 5 days prior to submission of a mine ventilation plan and any revision to a mine ventilation plan. If requested, the mine operator shall provide a copy to the representative of miners at the time of notification. In the event of a situation requiring immediate action on a plan revision, notification of the revision shall be given, and if requested, a copy of the revision shall be provided, to the representative of miners by the operator at the time of submittal;

(ii) A copy of the proposed ventilation plan, and a copy of any proposed revision, submitted for approval shall be made available for inspection by the representative of miners; and

(iii) A copy of the proposed ventilation plan, and a copy of any proposed revision, submitted for approval shall be posted on the mine bulletin board at the time of submittal. The proposed plan or proposed revision shall remain posted until it is approved, withdrawn or denied.

(b) Following receipt of the proposed plan or proposed revision, the representative of miners may submit timely comments to the district manager, in writing, for consideration during the review process. A copy of these comments shall also be provided to the operator by the district manager upon request.

(c) (1) The district manager will notify the operator in writing of the approval or denial of approval of a proposed ventilation plan or proposed revision. A copy of this notification will be sent to the representative of miners by the district manager.

(2) If the district manager denies approval of a proposed plan or revision, the deficiencies of the plan or revision shall be specified in writing and the operator will be provided an opportunity to discuss the deficiencies with the district manager.

(d) No proposed ventilation plan shall be implemented before it is approved by the district manager. Any intentional change to the ventilation system that alters the main air current or any split of the main air current in a manner that could materially affect the safety and health of the miners, or any change to the information required in § 75.371 shall be submitted to and approved by the district manager before implementation.

(e) Before implementing an approved ventilation plan or a revision to a ventilation plan, persons affected by the revision shall be instructed by the operator in its provisions.

(f) The approved ventilation plan and any revisions shall be—

(1) Provided upon request to the representative of miners by the operator following notification of approval;

(2) Made available for inspection by the representative of miners; and

(3) Posted on the mine bulletin board within 1 working day following notification of approval. The approved plan and revisions shall remain posted on the bulletin board for the period that they are in effect.

(g) The ventilation plan for each mine shall be reviewed every 6 months by an authorized representative of the Secretary to assure that it is suitable to current conditions in the mine.

§ 75.371 Mine ventilation plan; contents.

The mine ventilation plan shall contain the information described below and any additional provisions required by the district manager:

(a) The mine name, company name, mine identification number, and the name of the individual submitting the plan information.

(b) Planned main mine fan stoppages, other than those scheduled for testing, maintenance or adjustment, including procedures to be followed during these stoppages and subsequent restarts (see § 75.311(a)) and the type of device to be used for monitoring main mine fan pressure, if other than a pressure recording device (see 75.310(a)(4)).

(c) Methods of protecting main mine fans and associated components from the forces of an underground explosion if a 15-foot offset from the nearest side of the mine opening is not provided (see § 75.310(a)(6)); and the methods of protecting main mine fans and intake air openings if combustible material will be within 100 feet of the area surrounding the fan or these openings (see § 75.311(f)).

(d) Persons that will be permitted to enter the mine, the work these persons will do while in the mine, and electric power circuits that will be energized when a back-up fan system is used that does not provide the ventilating quantity provided by the main mine fan (see § 75.311(c)).

(e) The locations and operating conditions of booster fans installed in anthracite mines (see § 75.302).

(f) Section and face ventilation systems used, including drawings illustrating how each system is used, and a description of each different dust suppression system used on equipment on working sections.

(g) Locations where the air quantities must be greater than 3,000 cubic feet per minute (see § 75.325(a)(1)).

(h) In anthracite mines, locations where the air quantities must be greater than 1,500 cubic feet per minute (see § 75.325(e)(1)).

(i) Working places and working faces other than those where coal is being cut, mined, drilled for blasting or loaded, where a minimum air quantity will be maintained, and the air quantity at those locations (see § 75.325(a)(1)).

(j) The operating volume of machine mounted dust collectors or diffuser fans, if used (see § 75.325(a)(3)).

(k) The minimum mean entry air velocity in exhausting face ventilation systems where coal is being cut, mined, drilled for blasting, or loaded, if the velocity will be less than 60 feet per minute. Other working places where coal is not being cut, mined, drilled for blasting or loaded, where at least 60 feet per minute or some other minimum mean entry air velocity will be maintained (see § 75.326).

(l) The maximum distance if greater than 10 feet from each working face at which face ventilation control devices will be installed (see § 75.330(b)(2)). The working places other than those where coal is being cut, mined, drilled for blasting or loaded, where face ventilation control devices will be used (see § 75.330(b)(1)(ii).

(m) The volume of air required in the last open crosscut or the quantity of air reaching the pillar line if greater than 9,000 cubic feet per minute (see § 75.325(b)).

(n) In anthracite mines, the volume of air required in the last open crosscut or the quantity of air reaching the pillar line if greater than 5,000 cubic feet per minute (see § 75.325(e)(2)).

(o) Locations where separations of intake and return air courses will be built and maintained to other than the third connecting crosscut outby each working face (see § 75.333(b)(1)).

(p) The volume of air required at the intake to the longwall sections, if different than 30,000 cubic feet per minute (see § 75.325(c)).

(q) The velocities of air on a longwall or shortwall face, and the locations where the velocities must be measured (see § 75.325(c)(2)).

(r) The minimum quantity of air that will be provided during the installation and removal of mechanized mining equipment, the location where this quantity will be provided, and the ventilation controls that will be used. (see § 75.325(d)).

(s) The locations and frequency of the methane tests if required more often by § 75.362(d)(1)(iii) (see § 75.362 (d)(1)(iii).

(t) The locations where samples for ''designated areas'' will be collected, including the specific location of each sampling device, and the respirable dust control measures used at the dust generating sources for these locations (see § 70.208 of this chapter).

(u) The methane and dust control systems at underground dumps, crushers, transfer points, and haulageways.

(v) Areas in trolley haulage entries where the air velocity will be greater than 250 feet per minute and the velocity in these areas (see § 75.327(b)).

(w) Locations where entries will be advanced less than 20 feet from the inby rib without a crosscut being provided where a line brattice will be required. (see § 75.333(g)).

(x) A description of the bleeder system to be used, including its design (see § 75.334).

(y) The means for determining the effectiveness of bleeder systems (see § 75.334(c)(2)).

(z) The locations where measurements of methane and oxygen concentrations and air quantities and tests to determine whether the air is moving in the proper direction will be made to evaluate the ventilation of nonpillared worked-out areas (see § 75.364 (a)(1)) and the effectiveness of bleeder systems (see § 75.364 (a)(2)(iii). Alternative methods of evaluation of the effectiveness of bleeder systems (§ 75.364 (a)(2)(iv)).

(aa) The means for adequately maintaining bleeder entries free of obstructions such as roof falls and standing water (see § 75.334(c)(3)).

(bb) The location of ventilation devices such as regulators, stoppings and bleeder connectors used to control air movement through worked-out areas (see § 75.334(c)(4)). The location and sequence of construction of proposed seals for each worked-out area. (see § 75.334(e)).

(cc) In mines with a demonstrated history of spontaneous combustion: a description of the measures that will be used to detect methane, carbon monoxide, and oxygen concentration during and after pillar recovery and in worked-out areas where no pillars have been recovered (see § 75.334(f)(1); and, the actions which will be taken to protect miners from the hazards associated with spontaneous combustion (see § 75.334(f)(2). If a bleeder system will not be used, the methods that will be used to control spontaneous combustion, accumulations of methane-air mixtures, and other gases, dusts, and fumes in the worked-out area (see § 75.334(f)(3)).

(dd) The location of all horizontal degasification holes that are longer than 1,000 feet and the location of all vertical degasification holes.

(ee) If methane drainage systems are used, a detailed sketch of each system, including a description of safety precautions used with the systems.

(ff) A description of the methods and materials to be used to seal worked-out areas if those methods or materials will be different from those specified by § 75.335(a)(1).

(gg) The alternative location for the additional sensing device if the device will not be installed on the longwall shearing machine (see § 75.342(a)(2)).

(hh) The ambient level in parts per million of carbon monoxide, and the method for determining the ambient level, in all areas where carbon monoxide sensors are installed.

(ii) The distance that separation between the primary escapeway and the belt or track haulage entries will be maintained if other than to the first connecting crosscut outby the section loading point (see § 75.380(g)).

(jj) In anthracite mines, the dimensions of escapeways where the pitch of the coal seam does not permit escapeways to be maintained 4 feet by 5 feet and the locations where these dimensions must be maintained (see § 75.381(c)(4)).

§ 75.372 Mine ventilation map.

(a)(1) At intervals not exceeding 12 months, the operator shall submit to the district manager 3 copies of an up-to-date map of the mine drawn to a scale of not less than 100 nor more than 500 feet to the inch. A registered engineer or a registered surveyor shall certify that the map is accurate.

(2) In addition to the informational requirements of this section the map may also be used to depict and explain plan contents that are required in § 75.371. Information shown on the map to satisfy the requirements of § 75.371 shall be subject to approval by the district manager.

(b) The map shall contain the following information:

(1) The mine name, company name, mine identification number, a legend identifying the scale of the map and symbols used, and the name of the individual responsible for the information on the map.

(2) All areas of the mine, including sealed and unsealed worked-out areas.

(3) All known mine workings that are located in the same coalbed within 1,000 feet of existing or projected workings. These workings may be shown on a mine map with a scale other than that required by paragraph (a) of this section, if the scale does not exceed 2,000 feet to the inch and is specified on the map.

(4) The locations of all known mine workings underlying and overlying the mine property and the distance between the mine workings.

(5) The locations of all known oil and gas wells and all known drill holes that penetrate the coalbed being mined.

(6) The locations of all main mine fans, installed backup fans and motors, and each fan's specifications, including size, type, model number, manufacturer, operating pressure, motor horsepower, and revolutions per minute.

(7) The locations of all surface mine openings and the direction and quantity of air at each opening.

(8) The elevation at the top and bottom of each shaft and slope, and shaft and slope dimensions, including depth and length.

(9) The direction of air flow in all underground areas of the mine.

(10) The locations of all active working sections and the four-digit identification number for each mechanized mining unit (MMU).

(11) The location of all escapeways.

(12) The locations of all ventilation controls, including permanent stoppings, overcasts, undercasts, regulators, seals, airlock doors, haulageway doors and other doors, except temporary ventilation controls on working sections.

(13) The direction and quantity of air—

(i) Entering and leaving each split;

(ii) In the last open crosscut of each set of entries and rooms; and

(iii) At the intake end of each pillar line, including any longwall or shortwall.

(14) Projections for at least 12 months of anticipated mine development, proposed ventilation controls, proposed bleeder systems, and the anticipated location of intake and return air courses, belt entries, and escapeways.

(15) The locations of existing methane drainage systems.

(16) The locations of all atmospheric monitoring system sensors.

(17) Contour lines that pass through whole number elevations of the coalbed being mined. These lines shall be spaced at 10-foot elevation levels unless a wider spacing is permitted by the district manager.

(18) The location of proposed seals for each worked-out area.

(19) The entry height, velocity and direction of the air current at or near the midpoint of each belt flight where the height and width of the entry are representative of the belt haulage entry.

(20) The location and designation of air courses that have been redesignated from intake to return for the purpose of ventilation of structures, areas or installations that are required by this subpart D to be ventilated to return air courses, and for ventilation of seals.

(c) The mine map required by § 75.1200 may be used to satisfy the requirements for the ventilation map, provided that all the information required by this section is contained on the map.

§ 75.373 Reopening mines.

After a mine is abandoned or declared inactive, and before it is reopened, mining operations shall not begin until MSHA has been notified and has completed an inspection.

§ 75.380 Escapeways; bituminous and lignite mines.

(a) Except in situations addressed in § 75.381, § 75.385 and § 75.386, at least two separate and distinct travelable passageways shall be designated as escapeways and shall meet the requirements of this section.

(b) (1) Escapeways shall be provided from each working section, and each area where mechanized mining equipment is being installed or removed, continuous to the surface escape drift opening or continuous to the escape shaft or slope facilities to the surface.

(2) During equipment installation, these escapeways shall begin at the projected location for the section loading point. During equipment removal, they shall begin at the location of the last loading point.

(c) The two separate and distinct escapeways required by this section shall not end at a common shaft, slope, or drift opening, except that multiple compartment shafts or slopes separated by walls constructed of noncombustible material may be used as separate and distinct passageways.

(d) Each escapeway shall be—

(1) Maintained in a safe condition to always assure passage of anyone, including disabled persons;

(2) Clearly marked to show the route and direction of travel to the surface;

(3) Maintained to at least a height of 5 feet from the mine floor to the mine roof, excluding the thickness of any roof support, except that the escapeways shall be maintained to at least the height of the coalbed, excluding the thickness of any roof support, where the coalbed is less than 5 feet. In areas of mines where escapeways pass through doors, the height may be less than 5 feet, provided that sufficient height is maintained to enable miners, including disabled persons, to escape quickly in an emergency. In areas of mines developed before November 16, 1992, where escapeways pass over or under overcasts or undercasts, the height may be less than 5 feet provided that sufficient height is maintained to enable miners, including disabled persons, to escape quickly in an emergency. When there is a need to determine whether sufficient height is provided, MSHA may require a stretcher test where 4 persons carry a miner through the area in question on a stretcher;

(4) Maintained at least 6 feet wide except—

(i) Where necessary supplemental roof support is installed, the escapeway shall not be less than 4 feet wide; or

(ii) Where the route of travel passes through doors or other permanent ventilation controls, the escapeway shall be at least 4 feet wide to enable miners to escape quickly in an emergency, or

(iii) Where the alternate escapeway passes through doors or other permanent ventilation controls or where supplemental roof support is required and sufficient width is maintained to enable miners, including disabled persons, to escape quickly in an emergency. When there is a need to determine whether sufficient width is provided, MSHA may require a stretcher test where 4 persons carry a miner through the area in question on a stretcher, or

(iv) Where mobile equipment near working sections, and other equipment essential to the ongoing operation of longwall sections, is necessary during normal mining operations, such as material cars containing rock dust or roof control supplies, or is to be used for the evacuation of miners off the section in the event of an emergency. In any instance, escapeways shall be of sufficient width to enable miners, including disabled persons, to escape quickly in an emergency. When there is a need to determine whether sufficient width is provided, MSHA may require a stretcher test where 4 persons carry a miner through the area in question on a stretcher;

(5) Located to follow the most direct, safe and practical route to the nearest mine opening suitable for the safe evacuation of miners; and

(6) Provided with ladders, stairways, ramps, or similar facilities where the escapeways cross over obstructions.

(e) Surface openings shall be adequately protected to prevent surface fires, fumes, smoke, and flood water from entering the mine.

(f) *Primary escapeway.* (1) One escapeway that is ventilated with intake air shall be designated as the primary escapeway.

(2) Paragraphs (f)(3) through (f)(7) of this section apply as follows:

(i) To all areas of a primary escapeway developed on or after November 16, 1992;

(ii) Effective as of March 11, 1997, to all areas of a primary escapeway developed between March 30, 1970 and November 16, 1992; and

(iii) Effective as of March 11, 1997, to all areas of the primary escapeway developed prior to March 30, 1970 where separation of the belt and trolley haulage entries from the primary escapeway existed prior to November 16, 1992.

(3) The following equipment is not permitted in the primary escapeway:

(i) Unattended operating diesel equipment without an automatic fire suppression system.

(ii) Mobile equipment hauling coal except for hauling coal incidental to cleanup or maintenance of the primary escapeway.

(iii) Compressors, except—

(A) Compressors necessary to maintain the escapeway in safe, travelable condition;

(B) Compressors that are components of equipment such as locomotives and rock dusting machines; and

(C) Compressors of less than five horsepower.

(iv) Underground transformer stations, battery charging stations, substations, and rectifiers except—

(A) Where necessary to maintain the escapeway in safe, travelable condition; and

(B) Battery charging stations and rectifiers and power centers with

transformers that are either dry-type or contain nonflammable liquid, provided they are located on or near a working section and are moved as the section advances or retreats.

(v) Water pumps, except—

(A) Water pumps necessary to maintain the escapeway in safe, travelable condition;

(B) Submersible pumps;

(C) Permissible pumps and associated permissible switchgear;

(D) Pumps located on or near a working section that are moved as the section advances or retreats;

(E) Pumps installed in anthracite mines; and

(F) Small portable pumps.

(4) Mobile equipment operated in the primary escapeway, except for continuous miners and as provided in paragraphs (f)(5), (f)(6), and (f)(7) of this section, shall be equipped with a fire suppression system installed according to §§ 75.1107–3 through 75.1107–16 that is—

(i) Manually operated and attended continuously by a person trained in the systems function and use, or

(ii) A multipurpose dry chemical type capable of both automatic and manual activation.

(5) Personnel carriers and small mobile equipment designed and used only for carrying people and small hand tools may be operated in primary escapeways if—

(i) The equipment is provided with a multipurpose dry chemical type fire suppression system capable of both automatic and manual activation, and the suppression system is suitable for the intended application and is listed or approved by a nationally recognized independent testing laboratory, or,

(ii) Battery powered and provided with two 10 pound multipurpose dry chemical portable fire extinguishers.

(6) Notwithstanding the requirements of paragraph (f)(3)(i), mobile equipment not provided with a fire suppression system may operate in the primary escapeway if no one is inby except those persons directly engaged in using or moving the equipment.

(7) Notwithstanding the requirements of paragraph (f)(3)(i), mobile equipment designated and used only as emergency vehicles or ambulances, may be operated in the primary escapeway without fire suppression systems.

(g) Except where separation of belt and trolley haulage entries from designated escapeways did not exist before November 15, 1992, the primary escapeway shall be separated from belt and trolley haulage entries for its entire length, to and including the first connecting crosscut outby each loading point except when a greater or lesser distance for this separation is specified and approved in the ventilation plan and does not pose a hazard to miners.

(h) *Alternate escapeway.* One escapeway shall be designated as the alternate escapeway. The alternate escapeway shall be separated from the primary escapeway for its entire length, except that the alternate and primary escapeways may be ventilated from a common intake air shaft or slope opening.

(i) Mechanical escape facilities shall be provided and maintained for—

(1) Each shaft that is part of a designated escapeway and is greater than 50 feet in depth; and

(2) Each slope from the coal seam to the surface that is part of a designated escapeway and is inclined more than 9 degrees from the horizontal.

(j) Within 30 minutes after mine personnel on the surface have been notified of an emergency requiring evacuation, mechanical escape facilities provided under paragraph (i) of this section shall be operational at the bottom of shaft and slope openings that are part of escapeways.

(k) Except where automatically activated hoisting equipment is used, the bottom of each shaft or slope opening that is part of a designated escapeway shall be equipped with a means of signaling a surface location where a person is always on duty when anyone is underground. When the signal is activated or the evacuation of persons underground is necessary, the person shall assure that mechanical escape facilities are operational as required by paragraph (j) of this section.

(l) (1) Stairways or mechanical escape facilities shall be installed in shafts that are part of the designated escapeways and that are 50 feet or less in depth, except ladders may be used in shafts that are part of the designated escapeways and that are 5 feet or less in depth.

(2) Stairways shall be constructed of concrete or metal, set on an angle not to exceed 45 degrees from the horizontal, and equipped on the open side with handrails. In addition, landing platforms that are at least 2 feet by 4 feet shall be installed at intervals not to exceed 20 vertical feet on the stairways and equipped on the open side with handrails.

(3) Ladders shall be constructed of metal, anchored securely, and set on an angle not to exceed 60 degrees from the horizontal.

(m) A travelway designed to prevent slippage shall be provided in slope and drift openings that are part of designated escapeways, unless mechanical escape facilities are installed.

§ 75.381 Escapeways; anthracite mines.

(a) Except as provided in §§ 75.385 and 75.386, at least two separate and distinct travelable passageways shall be designated as escapeways and shall meet the requirements of this section.

(b) Escapeways shall be provided from each working section continuous to the surface.

(c) Each escapeway shall be—

(1) Maintained in a safe condition to always assure passage of anyone, including disabled persons;

(2) Clearly marked to show the route of travel to the surface;

(3) Provided with ladders, stairways, ramps, or similar facilities where the escapeways cross over obstructions; and

(4) Maintained at least 4 feet wide by 5 feet high. If the pitch or thickness of the coal seam does not permit these dimensions to be maintained other dimensions may be approved in the ventilation plan.

(d) Surface openings shall be adequately protected to prevent surface fires, fumes, smoke, and flood water from entering the mine.

(e) *Primary escapeway.* One escapeway that shall be ventilated with intake air shall be designated as the primary escapeway.

(f) *Alternate escapeway.* One escapeway that shall be designated as the alternate escapeway shall be separated from the primary escapeway for its entire length.

(g) Mechanical escape facilities shall be provided—

(1) For each shaft or slope opening that is part of a primary escapeway; and

(2) For slopes that are part of escapeways, unless ladders are installed.

(h) Within 30 minutes after mine personnel on the surface have been notified of an emergency requiring evacuation, mechanical escape facilities shall be operational at the bottom of each shaft and slope opening that is part of an escapeway.

(i) Except where automatically activated hoisting equipment is used, the bottom of each shaft or slope opening that is part of a primary escapeway shall be equipped with a means of signaling a surface location where a person is always on duty when anyone is underground. When the signal is activated or the evacuation of personnel is necessary, the person on duty shall assure that mechanical escape facilities are operational as required by paragraph (h) of this section.

§ 75.382 Mechanical escape facilities.

(a) Mechanical escape facilities shall be provided with overspeed, overwind, and automatic stop controls.

(b) Every mechanical escape facility with a platform, cage, or other device shall be equipped with brakes that can stop the fully loaded platform, cage, or other device.

(c) Mechanical escape facilities, including automatic elevators, shall be examined weekly. The weekly examination of this equipment may be conducted at the same time as a daily examination required by § 75.1400–3.

(1) The weekly examination shall include an examination of the headgear, connections, links and chains, overspeed and overwind controls, automatic stop controls, and other facilities.

(2) At least once each week, the hoist shall be run through one complete cycle of operation to determine that it is operating properly.

(d) A person trained to operate the mechanical escape facility always shall be available while anyone is underground to provide the mechanical escape facilities, if required, to the bottom of each shaft and slope opening that is part of an escapeway within 30 minutes after personnel on the surface have been notified of an emergency requiring evacuation. However, no operator is required for automatically operated cages, platforms, or elevators.

(e) Mechanical escape facilities shall have rated capacities consistent with the loads handled.

(f) Manually-operated mechanical escape facilities shall be equipped with indicators that accurately and reliably show the position of the facility.

(g) Certification. The person making the examination as required by paragraph (c) of this section shall certify by initials, date, and the time that the examination was made. Certifications shall be made at or near the facility examined.

§ 75.383 Escapeway maps and drills.

(a) A map shall be posted or readily accessible to all miners in each working section, and in each area where mechanized mining equipment is being installed or removed. The map shall show the designated escapeways from the working section to the location where miners must travel to satisfy the escapeway drill specified in paragraph (b)(1) of this section. A map showing the main escapeways shall be posted at a surface location of the mine where miners congregate, such as at the mine bulletin board, bathhouse, or waiting room. All maps shall be kept up to date, and any changes in route of travel, locations of doors, or directions of airflow shall be shown on the maps by the end of the shift on which the changes are made, and affected miners shall be informed of the changes before entering the underground areas of the mine. Miners underground on a shift when any such change is made shall be immediately notified of the change.

(b) (1) At least once every 90 days, each miner, including miners with working stations located between working sections and main escapeways, shall participate in a practice escapeway drill. During this drill, each miner shall travel the primary or alternate escapeway from the miner's working section or area where mechanized mining equipment is being installed or removed, to the area where the split of air ventilating the working section intersects a main air course, or 2,000 feet outby the section loading point, whichever distance is greater. Other miners shall participate in the escapeway drill by traveling in the primary or alternate escapeway for a distance of 2,000 feet from their working station toward the nearest escape facility or drift opening. An escapeway drill shall not be conducted in the same escapeway as the immediately preceding drill.

(2) At least once every 6 weeks and for each shift, at least two miners on each coal producing working section who work on that section, accompanied by the section supervisor, shall participate in a practice escape drill and shall travel the primary or alternate escapeway from the location specified in paragraph (b)(1) of this section, to the surface, to mechanical escape facilities, or to an underground entrance to a shaft or slope to the surface. Systematic rotation of section personnel shall be used so that all miners participate in this drill. An escapeway drill shall not be conducted in the same escapeway as the immediately preceding drill.

(3) At least once every 6 weeks, at least two miners on each maintenance shift and a supervisor, shall participate in a practice escape drill and shall travel the primary or alternate escapeway from the location specified in paragraph (b)(1) of this section, to the surface, to mechanical escape facilities, or to an underground entrance to a shaft or slope to the surface. Systematic rotation of maintenance personnel and working sections shall be used so that all miners participate in this drill and the escapeways from all sections are traveled. An escapeway drill shall not be conducted in the same escapeway as the immediately preceding drill.

(4) Before or during practice escapeway drills, miners shall be informed of the locations of fire doors, check curtains, changes in the routes of travel, and plans for diverting smoke from escapeways.

(c) The practice escapeway drills may be used to satisfy the evacuation specifications of the fire drills required by § 75.1101–23.

§ 75.384 Longwall and shortwall travelways.

(a) If longwall or shortwall mining systems are used and the two designated escapeways required by § 75.380 are located on the headgate side of the longwall or shortwall, a travelway shall be provided on the tailgate side of that longwall or shortwall. The travelway shall be located to follow the most direct and safe practical route to a designated escapeway.

(b) The route of travel shall be clearly marked.

(c) When a roof fall or other blockage occurs that prevents travel in the travelway—

(1) Work shall cease on the longwall or shortwall face;

(2) Miners shall be withdrawn from face areas to a safe area outby the section loading point; and

(3) MSHA shall be notified.

(d) Work may resume on the longwall or shortwall face after the procedures set out in §§ 75.215 and 75.222 are implemented.

§ 75.385 Opening new mines.

When new mines are opened, no more than 20 miners at a time shall be allowed in any mine until a connection has been made between the mine openings, and these connections shall be made as soon as possible.

§ 75.386 Final mining of pillars.

When only one mine opening is available due to final mining of pillars, no more than 20 miners at a time shall be allowed in the mine, and the distance between the mine opening and working face shall not exceed 500 feet.

§ 75.388 Boreholes in advance of mining.

(a) Boreholes shall be drilled in each advancing working place when the working place approaches—

(1) To within 50 feet of any area located in the mine as shown by surveys that are certified by a registered engineer or registered surveyor unless the area has been preshift examined;

(2) To within 200 feet of any area located in the mine not shown by surveys that are certified by a registered engineer or registered surveyor unless the area has been preshift examined; or

(3) To within 200 feet of any mine workings of an adjacent mine located in

the same coalbed unless the mine workings have been preshift examined.

(b) Boreholes shall be drilled as follows:

(1) Into the working face, parallel to the rib, and within 3 feet of each rib.

(2) Into the working face, parallel to the rib, and at intervals across the face not to exceed 8 feet.

(3) At least 20 feet in depth in advance of the working face, and always maintained to a distance of 10 feet in advance of the working face.

(c) Boreholes shall be drilled in both ribs of advancing working places described in paragraph (a) of this section unless an alternative drilling plan is approved by the District Manager in accordance with paragraph (g) of this section. These boreholes shall be drilled—

(1) At an angle of 45 degrees to the direction of advance;

(2) At least 20 feet in depth; and

(3) At intervals not to exceed 8 feet.

(d) When a borehole penetrates an area that cannot be examined, and before mining continues, a certified person shall, if possible, determine—

(1) The direction of airflow in the borehole;

(2) The pressure differential between the penetrated area and the mine workings;

(3) The concentrations of methane, oxygen, carbon monoxide, and carbon dioxide; and

(4) Whether water is impounded within the penetrated area.

(e) Unless action is taken to dewater or to ventilate penetrated areas, boreholes shall be plugged with wooden plugs or similar devices when—

(1) Tests conducted at the boreholes show that the atmosphere in the penetrated area contains more than 1.0 percent methane, less than 19.5 percent oxygen, or harmful concentrations of carbon monoxide, carbon dioxide or other explosive, harmful or noxious gases;

(2) Tests for methane, oxygen, carbon monoxide, and carbon dioxide cannot be made because air from mine workings is flowing into the penetrated area; or

(3) Water is discharging through the boreholes from the penetrated area into the mine workings.

(f) If mining is to be conducted within 50 feet above or below an inaccessible area of another mine, boreholes shall be drilled, as necessary, according to a plan approved by the district manager.

(g) Alternative borehole patterns that provide the same protection to miners as the pattern established by paragraphs (b) and (c) of this section may be used under a plan approved by the district manager.

§ 75.389 Mining into inaccessible areas.

(a) (1) The operator shall develop and follow a plan for mining into areas penetrated by boreholes drilled under § 75.388.

(2) Mining shall not resume into any area penetrated by boreholes until conditions in the penetrated area can be determined under § 75.388 and the plan for mining-through into the area has been approved by the district manager.

(3) A copy of the procedures to be followed shall be posted near the site of the mining-through operations and the operator shall explain these procedures to all miners involved in the operations.

(b) The procedures specified in the plan shall include—

(1) The method of ventilation, ventilation controls, and the air quantities and velocities in the affected working section and working place;

(2) Dewatering procedures to be used if a penetrated area contains a water accumulation; and

(3) The procedures and precautions to be followed during mining-through operations.

(c) Except for routine mining-through operations that are part of a retreat section ventilation system approved in accordance with § 75.371(f) and (x), the following provisions shall apply:

(1) Before and during mining-through operations, a certified person shall perform air quality tests at intervals and at locations necessary to protect the safety of the miners.

(2) During mining-through operations, only persons involved in these operations shall be permitted in the mine; and

(3) After mining-through, a certified person shall determine that the affected areas are safe before any persons enter the underground areas of the mine.

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