

EFFECTIVE DATE: 12/30/2013  
LAST VALIDATED: 03/29/2024

EXPIRATION DATE: 3/31/2026

PROGRAM POLICY LETTER NO. P13-V-12

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SUBJECT: Examination, Evaluation, and Effectiveness of Bleeder Systems

**Scope**

This Program Policy Letter (PPL) affects underground coal mine operators, miners, and Coal Mine Safety and Health (CMS&H) personnel.

**Purpose**

The purpose of this PPL is to provide notice and guidance to underground coal mine operators, miners, and Coal Mine Safety and Health personnel relative to the Mine Safety and Health Administration's (MSHA) application of 30 CFR §§ 75.334, 75.364, and 75.371. MSHA recognizes that guidance is necessary to provide consistency in the application of the standards with regard to travel, examination, evaluation, and means for determining the effectiveness of bleeder systems. Therefore, MSHA is issuing this policy letter to clarify and improve the examination and evaluation of bleeder systems by mine operators in future development and mining activity after the PPL's effective date. It is anticipated that District Managers would not suggest changes to the relevant portions of existing approved ventilation plans absent conditions affecting the safety or health of miners that arise following the issuance and effective date of this PPL. This policy letter, in part, addresses issues identified in the accident investigation and internal review reports following the Upper Big Branch Mine explosion. MSHA determined that the mine operator did not properly examine bleeder entries. While these failures were not root causes of the explosion, MSHA did issue violations as a result.

**Policy**

Title 30 CFR § 75.334(b) requires that during and after 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. A bleeder system includes the area from which pillars are wholly or partially recovered, bleeder entries, bleeder connectors, and all associated ventilation control devices that control the air movement through the area. Bleeder entries are air courses designed and maintained as part of the bleeder system.

### **Examination and Evaluation**

Examinations provide the means of collecting information needed to evaluate a bleeder system's effectiveness. To evaluate the effectiveness of bleeder systems, measurements of methane and oxygen concentrations and air quantity, and a test to determine if the air is moving in the proper direction must be made at all locations required in 30 CFR §§ 75.364(a)(2)(i), (ii), and (iii).

Under 30 CFR § 75.364(a)(2)(iii), "[a]t least one entry of each set of bleeder entries used as part of a bleeder system under 30 CFR § 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 [MPLs] specified in the mine ventilation plan to determine the effectiveness of the bleeder system." Title 30 CFR § 75.334(c) requires that the approved ventilation plan specify the design and use of bleeder systems; the means to determine the effectiveness of bleeder systems; the means for adequately maintaining bleeder entries free of obstructions, such as from roof falls and standing water; and the location of ventilating devices, such as regulators, stoppings, and bleeder connectors used to control air movement through the area. Traveling one entry of each set of bleeder entries provides the means to assure that the bleeder is properly maintained and enables an evaluation of the adequacy of the approved means of maintaining the bleeder entries free of obstructions.

Routine inspection of the ventilating devices that control airflow in the bleeder system is prudent. Safe access to such critical ventilating devices is an important consideration in evaluating a mine ventilation plan for approval.

Appropriate locations of MPLs enable a determination that the bleeder system is working effectively, providing sufficient ventilation through the worked-out area so as to prevent, to the extent practicable, accumulations of gases, dusts, or fumes within bleeder systems that pose a hazard to the active workings or that have the potential to result in injuries to miners. Bleeder systems appropriately designed and adequately maintained for the conditions and mining system at the mine enable safe access to such examination locations until the worked-out area is sealed.

Title 30 CFR § 75.364(a)(2)(iv) permits an alternative method of bleeder evaluation, in lieu of the requirements of 30 CFR §§ 75.364(a)(2)(i) and 75.364(a)(2)(iii), provided the alternative method results in a proper evaluation of the bleeder system and is approved in the mine ventilation plan. MSHA will consider alternative methods, including

establishment of evaluation points (EPs), on a mine-by-mine basis. In determining if a proposed alternative method of evaluation under this section results in a proper evaluation of the effectiveness of the bleeder system, MSHA District Managers should also consider factors identified in this PPL, including the requirements of 30 CFR §§ 75.364(a)(2)(i) and 75.364(a)(2)(iii), and the conditions and mining system at the mine. Title 30 CFR § 75.364(a)(2)(iv) does not permit a means for an alternative method of evaluation in lieu of the requirements of 30 CFR § 75.364(a)(2)(ii). Consistent with 30 CFR § 75.370 and current practice, the District Manager has the authority and responsibility, through the plan approval process, to ensure the mine ventilation plan is suitable to the conditions and mining system at the mine.

MSHA anticipates that a description of the full extent of the worked-out area intended to be ventilated by the bleeder system would be included in the mine ventilation plan as part of the specified design and use of the bleeder system. Other important information includes identification of bleeder entries intended to be examined. MSHA District Managers should consider this, as well as other, information in making a determination as to whether or not the mine ventilation plan is suitable to the conditions and mining system at the mine.

### **Pillared Areas and Bleeder Entries**

The term “pillared area”, as used in this PPL, is any area where a reduction in pillar size has occurred during retreat mining, including longwall or shortwall mining. The pillared area is comprised of the caved and broken material (rubble), the interstices within the caved material, and the open spaces surrounding the caved material. For longwalls or shortwalls, the former recovery face and set-up entry, headgate entry, and tailgate entry consumed by the recovery of the longwall pillar are considered part of the pillared area. The mined out portion of each longwall pillar (panel) is considered an individual and separate pillared area where one or more entries remain between pillared areas of adjacent panels. For room and pillar retreat mining, the former entries, rooms and/or crosscuts defined by pillars that were partially or fully recovered during retreat mining are considered part of the pillared area.

In certain bleeder system designs, some entries and/or rooms surrounding the pillared area may not have been routinely identified as traveled bleeder entries. These entries and/or rooms have been commonly referred to as primary internal airflow paths, open areas within the worked-out area, inner bleeders, mine foreman entries, part of the gob, or by other names. However, these entries and/or rooms around the pillared area are an inherent part of many bleeder systems and function as bleeder entries in that gases, dusts, and fumes from the pillared area are moved into and through these entries and/or rooms away from active workings. In reviewing bleeder system designs, MSHA will evaluate whether these entries and/or rooms are bleeder entries, except those which have become a part of the worked-out area between adjacent pillared areas. In ordinary cases, MSHA would anticipate that at least one entry of each set of bleeder

entries around the perimeter of the worked-out area should be traveled in its entirety. Because their integrity can be critical to the effectiveness of bleeder systems, mine operators and MSHA District Managers should consider the means for control of ground and water in these entries and/or rooms during the mine ventilation plan submittal, evaluation, approval, and review process. Mine operators and MSHA District Managers should also consider the function of such entries and/or rooms in the bleeder system design when assessing the appropriateness of examinations and/or alternative methods of evaluation approved under 30 CFR §§ 75.364(a)(2)(iii) and (iv), respectively. The determination as to the extent of travel necessary to conduct a proper examination and evaluation through such entries and/or rooms, and the location of MPLs and/or EPs, will be considered on a case-by-case and mine-by-mine basis.

### **Methane and Other Gases, Dusts, and Fumes**

Bleeder systems must control the air passing through the area and continuously dilute and move methane-air mixtures and other gases, dusts, and fumes from the worked-out area away from active workings, in an effective manner, which also prevents hazardous accumulations. A bleeder system is intended to ventilate the worked-out area so as to protect active workings from the hazards of methane accumulations and hazardous accumulations of other gases, dusts, and fumes.

Methane concentrations within a bleeder system should be evaluated and considered when assessing bleeder system effectiveness. Accumulations of methane that are explosive, can become explosive when mixed with air, are approaching the explosive range, or are irrespirable, may pose a hazard to the active workings whether they occur in accessible areas or not. Accumulations of methane that pose a hazard to the active workings are indicative of an ineffective bleeder system. The location, extent, and composition of the accumulation are some of the considerations in determining whether the accumulation poses a hazard to the active workings. Each situation should be evaluated on a case-by-case basis.

Although methane accumulations are a primary concern, accumulations of other gases, dusts, or fumes within a bleeder system should also be evaluated when assessing bleeder system effectiveness. Inadequate ventilation of worked-out areas may result in accumulations of other gases, dusts, or fumes which may pose a hazard to the active workings. MSHA considers accumulations of other gases, dusts, or fumes within bleeder systems, which have the potential to result in injuries to miners, as indicative of an ineffective bleeder system. The location, extent, and composition of the accumulation are some of the considerations in determining whether the accumulation poses a hazard to the active workings. Each situation should be evaluated on a case-by-case basis.

In properly designed and maintained bleeder systems, a correlation exists between the gas concentrations at approved examination locations and the gas concentration in

areas within the worked-out area where miners may not normally work or travel. Gas concentrations that do not appear to be representative of the expected air quality or an improper air direction at approved MPLs, approved EPs, or in bleeder entries are indications that further investigation may be necessary to determine if the bleeder system is still working effectively. Also, corrections or adjustments may be necessary to comply with the approved ventilation plan. If it is determined that the approved examination locations do not result in a proper evaluation of the bleeder system, the approved mine ventilation plan should be revised in order to assure proper evaluation.

### **Airflow Direction**

In order to make a determination as to whether air is moving in the proper direction at the examination locations, as required under 30 CFR §§ 75.364(a)(2)(i), (ii), and (iii), and, if appropriate, at EPs approved as part of an alternative method of evaluation per 30 CFR § 75.364(a)(2)(iv), the proper airflow direction at each of the examination locations and in the bleeder entries must be known. The direction of airflow in the bleeder system, including the worked-out area, is a part of the bleeder system design that is required to be approved in the mine ventilation plan as specified in 30 CFR § 75.371(x). MSHA anticipates this necessary information would be conveyed by map or diagram and included in the mine ventilation plan. If it cannot be determined whether the bleeder system produces air movement at approved examination locations as required by 30 CFR §§ 75.364(a)(2)(i), (ii), and (iii), and if appropriate, at EPs approved as part of an alternative method of evaluation per 30 CFR § 75.364(a)(2)(iv), and elsewhere in the bleeder system as specified in the approved mine ventilation plan, the bleeder system is not in compliance with the approved mine ventilation plan.

### **Mine Operators' Responsibility**

Nothing in this Program Policy Letter abrogates, alters, or diminishes a mine operator's responsibility under 30 CFR § 75.334(b)(1) to ensure that bleeder systems are effective and maintained so as 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. Each mine operator has a continuing obligation to evaluate the effectiveness of the bleeder system by a method and at locations appropriate to the circumstances.

### **Background**

In 1996, MSHA offered the Bleeder and Gob Ventilation Systems training course (BAG Course) to improve general knowledge of the design, approval, examination, evaluation, and inspection of bleeder systems used to ventilate pillared areas in underground coal mines. The BAG Course was MSHA's first effort to ensure that ventilation specialists were trained on MSHA's new ventilation standards. As discussed during the BAG Course training, the written course material was not intended to constitute Agency policy. MSHA is issuing this policy letter to provide

consistency and improve the examination and evaluation of bleeder systems by mine operators.

Since 1992, longwall panels have more than doubled in size. Production rates have also increased. Accordingly, significantly more methane can be liberated during production from the typical present-day longwall panel. MSHA has identified deficiencies in bleeder systems that involved examination, evaluation, and effectiveness, due in part to the extended size of the worked-out area. Some present-day longwall panels are more than 4 miles long. MSHA has determined there is a need for greater focus on safe travel and access to the locations necessary for proper evaluation of bleeder systems.

Recognizing that the mining industry would have an interest in the development of a PPL addressing bleeder system effectiveness, MSHA sponsored a Ventilation Summit at the National Mine Health and Safety Academy on February 21 and 22, 2007. MSHA conducted a question and answer session during the summit at which a number of issues were raised and received three written comments concerning the draft policy after the conclusion of the summit. MSHA has considered those questions and comments in the development of this PPL.

MSHA accident investigation reports reveal that accumulations of methane-air mixtures within the worked-out area were ignited and resulted in explosions that have caused fatalities and other injuries to miners and/or compromised the safety of the active workings. Methane accumulations in open areas that are above the explosive limit can also be hazardous since they may become involved in and contribute to the severity of an ignition or explosion that occurs in other areas of the mine and/or may be irrespirable. MSHA has also found water accumulations and roof falls in traveled bleeder entries and other entries and/or rooms that surround the pillared area which have adversely impacted the effectiveness of bleeder systems.

Accidents, near misses, and enforcement history relating to bleeder systems show that a greater emphasis on improved control of water and ground conditions and on safe travel for examinations is needed. Since 1981, several ignitions/explosions involving methane accumulations in bleeder systems have occurred, including events at the following mines: No. 21 Mine (Grundy), 1981; Greenwich Collieries No. 1 Mine, 1984; Pyro No. 9 Slope William Station Mine, 1989; No. 3 Mine (Southmountain), 1992; Amonate No. 31 Mine, 1992; Maple Meadow Mine, 1993; Elmo No. 5 Mine, 1993; Justice # 1 Mine, 1999; Willow Creek Mine, 2000; and Pinnacle Mine, 2003. Also, since 2005, more than 25 imminent danger orders were issued in response to conditions found in bleeder systems. In addition, on April 5, 2010, an explosion occurred at the Upper Big Branch Mine-South, Performance Coal Company, which claimed the lives of 29 miners. The MSHA fatal accident investigation report lists problems associated with the longwall bleeder system, including failure by the mine operator to conduct adequate weekly examinations, failure by the mine operator to identify and correct hazardous

conditions, such as accumulations of combustible material and water, failure by the mine operator to travel to all measurement point locations and evaluation points, failure by the mine operator to take air quantity and quality measurements, and failure by the mine operator to effectively evaluate the performance of the mine ventilation system.

Mine operators and miners would benefit from improved maintenance, examination, and evaluation of worked-out areas and clarification of factors which would be considered in determining the effectiveness of a bleeder system. Therefore, this PPL is being issued to provide notice and guidance to the mining industry regarding criteria MSHA will consider in determining bleeder system effectiveness.

### **Authority**

Federal Mine Safety and Health Act of 1977, as amended, 30 U.S.C. § 801 *et seq.*; 30 CFR §§ 75.334, 75.364, 75.371; *Plateau Mining Corp. v. F.M.S.H.R.C.*, 519 F.3d 1176 (10<sup>th</sup> Cir. 2008); and *Cumberland Coal Resources, LP v. F.M.S.H.R.C.*, 515 F.3d 247 (3d Cir. 2008). This PPL is a “general statement of policy” under 5 U.S.C. § 553(b)(3)(A).

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### **Internet Availability**

This PPL may be viewed on the Internet by accessing [MSHA's home page](#) and then choosing “MSHA’s Major Laws, Regulations and Policies” and “Compliance Information (PIBs, PILs, the PPM, and More)” and “Program Policy Letters”.

### **Distribution**

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