Appendix A – Program Area Responses

U.S. Department of Labor

Mine Safety and Health Administration
1100 Wilson Boulevard
Arlington, Virginia 22209-3939

MAR - 1 2012

MEMORANDUM FOR INTERNAL REVIEW TEAM

FROM: JOSEPH A. MAIN [redacted]
Assistant Secretary of Labor for
Mine Safety and Health

SUBJECT: Corrective Actions Response to Recommendations of the Internal Review Report

Please find attached the corrective actions that address the recommendations from the Mine Safety and Health Administration's (MSHA) internal review of the April 5, 2010 Upper Big Branch (UBB) mine disaster. They are from the Administrators of Coal Mine Health and Safety and Metal Nonmetal Health of Safety, and the Directors of Education and Policy Development, Technical Support, Program Evaluation and Information Resources, and the Office of Assessments, Accountability, Special Enforcement and Investigations. These are in addition to several actions already taken by MSHA following the UBB tragedy. Some recommendations directed to the Office of Assistant Secretary are addressed below.

MSHA Inspectors and Other Personnel

The internal review report recommended that the Assistant Secretary consider making some Educational Field Services (EFS) specialists authorized representatives (ARs) to assist Coal Mine Safety and Health (CMS&H) in inspecting training records and conducting additional Part 50 reporting and recordkeeping audits. Currently, these specialists do assist in conducting audits on a case-by-case basis. We will evaluate how the Agency can best conduct its Part 50 audits and evaluate training records.

In addition, the internal review report suggested that the Assistant Secretary develop a succession plan for the Agency, pointing out that succession planning is essential to ensure that MSHA is able to maintain a core of fully trained and experienced inspectors. We are currently developing a succession plan for the Agency to address staffing issues and have nearly finalized the plan. Staffing under the plan will be in accordance with Federal personnel regulations.

Directives System

The internal review identified that the MSHA's Directive System, originally designed to centralize the development and dissemination of Agency policy to its employees, was changed in 2002 and is not performing as originally intended.

You can now file your MSHA forms online at www.MSHA.gov. It's easy, it's fast, and it saves you money!

According to the Internal Review report, MSHA personnel do not have easy access to the most accurate and updated handbooks and policies, and the volume of information in the directives system exceed what an employee "could reasonably be expected to learn or retain." The team made several recommendations to the Assistant Secretary to re-institute the original Directives System and improve its utility.

We have already made great strides on the recommendation related to an improved directives system. In a Memorandum dated July 21, 2010, I asked the Administrators for CMS&H and Metal and Nonmetal Mine Safety and Health to establish a detailed plan for the review of all of the policies and procedures inspectors must follow when conducting inspections. A plan was then put into place that has resulted in a draft of the General Coal Mine Inspection Procedures and Inspection Tracking System Handbook (Metal and Nonmetal Mine Safety and Health has established its own committee to revise all of the Metal and Nonmetal handbooks, including its general procedures handbook).

On January, 17, 2012, I created a task force to be overseen by the Deputy Assistant Secretary for Operations to begin the next phase of the project to review the draft coal mine enforcement handbook and develop an improved handbook for use by coal mine inspectors. The improved handbook will also include any additional procedure and policy changes identified by the internal review report. The task force has also been charged with identifying and developing changes to the Directives System's Inspection Tracking System technology so that the handbook and forms included in the handbook interact in a seamless user-friendly fashion.

I have also assigned the Deputy Assistant Secretary for Operations the responsibility for developing a centralized administrative review process for updating and monitoring all of MSHA's Directives and the Directives System so that MSHA's enforcement and other personnel are well informed and MSHA programs operate in a fair and consistent manner. The administrative process will have procedures in place to monitor policy development, evaluate the program directives for need, consistency and impact on the Agency, and facilitate the activities of the policy coordinators from all MSHA programs.

Mine Rescue and Recovery

The internal review recommended that the Assistant Secretary convene a panel of mine experts to review mine rescue and recovery protocol to address lessons learned from the Upper Big Branch (UBB) disaster. On May 7, 2012, I am convening a two-day mine rescue summit at the MSHA Academy in Beckley, WV. Mine rescue experts from all sectors of the mining world have been invited and are expected to attend. The summit coincides with mine rescue competitions, so those participants can attend the summit as well. The goal of the summit is to provide information from all sectors about the latest improvements in mine rescue, to identify gaps in mine rescue response and preparedness, and to decide what further actions are needed to ensure that a swift and

comprehensive response occurs from government, industry and others when a mine emergency occurs.

The internal review report also recommended that MSHA require a "firewall" during rescue and recovery operations to prevent personnel who have had personal contact with family members from participating in command center decisions. As this recommendation is evaluated, other factors must be considered. Because MSHA, state agencies, mine companies, and miners' representatives participate in mine emergency response, the need to provide an effective emergency response and ensure the legal rights of other entities must be weighed against any decision about participation in command and control decisions.

Rulemaking: MSHA will review the recommendations of the accident investigation and internal review teams in developing its response to regulatory recommendations. MSHA has finalized a rule to increase the minimum incombustible content of rock dust and has proposed rules on pattern of violations, respirable dust, and requiring mine operators to examine and take corrective actions for violations that they find.

In order to ensure that work on the corrective actions is proceeding in a timely matter, I will convene meetings, to occur at least monthly, to monitor the progress of the assigned program areas.

I want to thank the internal review team for conducting a thorough and extensive review. The information in the report will be invaluable as MSHA moves forward with its corrective actions to improve the Agency's performance and safety and health of miners.

U.S. Department of Labor

Mine Safety and Health Administration
1100 Wilson Boulevard
Arlington, Virginia 22209-3939

MAR - 1 2012

MEMORANDUM FOR JOSEPH A. MAIN
Assistant Secretary of Labor for
Mine Safety and Health
Signature

THROUGH: PATRICIA W. SILVEY
Deputy Assistant Secretary for Operations

FROM: KEVIN G. STRICKLIN Signature
Administrator for
Coal Mine Safety and Health
Signature
NEAL H. MERRIFIELD
Administrator for Metal Nonmetal
Safety and Health

JEFFREY A. DUNCAN Signature Robert Glatter for
Director of Education Policy
And Development

for JAY MATTOS Signature Linda Weitershausen
Director of the Office of Assessments,
Accountability, Special Enforcement and
Investigations

SYED HAFEEZ Signature
Acting Director of Program Evaluation and
Information Resources

JEFFERY KRAVITZ Signature
Acting Director of Technical Support

SUBJECT: Upper Big Branch Internal Review Report

Consistent with Chapter 1200, Section 1262 of the Administrative Policy and Procedures Manual, attached please find a written summary (spread sheet) of the actions to be taken to correct any deficiencies identified in the internal review report. We acknowledge that improvements are needed, and based on the internal review recommendations, have identified specific areas where corrective actions are warranted.

Attachment

You can now file your MSHA forms online at www.MSHA.gov. It's easy, it's fast, and it saves you money!

Section	Recommendation	Corrective Action	Expected Completion Date
Section 103(a) Inspections	The Administrators for Coal and MNM should direct the revision of the Program Policy Manual to clarify MSHA's interpretation of the phrase "mine in its entirety at least four times a year as referenced by section 103(a) of the Mine Act.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives, the Program Policy Manual will be revised to clarify MSHA's interpretation of the phrase "mine in its entirety at least four times a year" as referenced in Section 103(a) of the Mine Act.	12/31/2013
Section 103(a) Inspections	The Administrator for Coal should make the following revisions to the General Coal Mine Inspection Procedures and Tracking System Handbook: • Define the salient parts of a regular inspection consistent with the requirements of subsections 103(a)(3) and (4) of the Mine Act. • Provide instruction on preparing ITS lists at the start of a regular inspection, and update them thereafter, to provide a complete list of salient items that need to be inspected. Inspection activities currently listed only in the Inspection Procedure Header Documentation tables should be incorporated into ITS lists in a manner that permits eliminating the former. The Handbook should explain that the purpose of the ITS includes planning and coordinating inspection activities, rather than proving their completion. • Provide instruction on obtaining, preparing, and maintaining regular inspection tracking maps. Inspectors should be directed to label MMUs and approved evaluation/measurement point locations on tracking maps. Inspectors should update the map to show the extent of mining when the MMU was inspected. Instruction to show the "extent of daily travels" on the map should be clarified to also direct inspectors to show travel start and stop points, the inspector's initials, and date of inspection. Where possible, the ITS should be streamlined to avoid duplication with the tracking map documentation. Line diagrams should not be used in lieu of tracking maps. • Define activities that ROE inspector trainees can perform at a mine before they receive their AR credentials.	This is included the Evaluation of Enforcement Policies and Procedures directed by Assistant Secretary Main on July 21, 2010, which is well underway. All of the policies and procedures have been collected and identified, and during the week of January 17, 2012, Assistant Secretary Main created a Task Force to begin the next phase to be overseen by the Deputy Assistant Secretary for Operations. The next phase is the review of the draft handbook and the development of a final handbook for inspectors to use. The final handbook will also include any additional procedure and policy changes identified in the internal review report.	12/31/2012
Section 103(a) Inspections	The Administrator for Coal should revise the Coal Mine Safety and Health Supervisor's Handbook to address correction of inspection deficiencies identified after a fiscal quarter expires, so that salient inspection activities can be conducted four times a year. Supervisors should direct inspectors responsible for deficiencies to reopen regular inspections and complete deficient activities related to salient parts of regular inspections. Prior to implementation, the Administrator should consult with the Director of PEIR to ensure that other programs or computer-based oversight tools will not be adversely affected when regular inspections are reopened after the end of a fiscal quarter.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives, the Coal Mine Safety and Health Supervisor's Handbook will be revised to address correction of inspection deficiencies identified after a fiscal quarter expires, so that salient inspection activities can be conducted four times a year. CMS&H will consult with PEIR to ensure that other programs or computer-based oversight tools will not be adversely affected when regular inspections are reopened after the end of a fiscal quarter.	12/31/2013
Section 103(a) Inspections	Administrator for Coal should direct District 4 and 12 Managers to conduct follow-up reviews of inspection reports to evaluate the effectiveness of training provided and take appropriate corrective actions for any deficiencies identified.	This will be addressed during the April 2012 training for all coal inspectors and specialists, including D4 and D12 personnel. Training was also conducted in August and October 2011 for supervisors in all Districts regarding the review of inspection reports. Annual training will be scheduled for all new supervisors on a recurring basis.	4/30/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Section 103(a) Inspections	Coal Mine Safety and Health and the Director of EPD to develop a training program for temporarily promoted supervisors to address pertinent parts of the Coal Mine Safety and Health Supervisor's Handbook. This training should include a knowledge check. Consideration should be given to utilizing distance learning options. In addition, guidelines should be developed for ADMs to provide the level of oversight necessary for work groups with inexperienced acting field office supervisors.	A. EPD is working with CMS&H to develop curriculum for a course for newly promoted or acting supervisors. The course will cover key material and responsibilities that individuals need to have as soon as possible after assuming a new supervisory position. This course will be developed and delivered online through the existing Distance Learning format and will contain knowledge checks. B. CMS&H will issue guidelines for ADMs to provide the level of oversight necessary for work groups with inexperienced acting field office supervisors.	9/30/2012
Section 103(a) Inspections	The Administrator for Coal should establish a procedure to update the list of records and postings contained in the General Coal Mine Inspection Procedures and Inspection Tracking System handbook when new regulations require the operator to maintain additional records or postings.	This is included the Evaluation of Enforcement Policies and Procedures directed by Assistant Secretary Main on July 21, 2010, which is well underway. All of the policies and procedures have been collected and identified, and during the week of January 17, 2012, AS Main created a Task Force to begin the next phase to be overseen by the Deputy Assistant Secretary for Operations. The next phase is the review of the draft handbook and the development of a final handbook for inspectors to use. The final handbook is also to include any additional procedure and policy changes as identified in the internal review report.	12/31/2012
Section 103(i) Spot Inspections	The Administrators for Coal and M&NM should direct the revision of the Program Policy Manual to address criteria for determining when section 103(i) inspection will be required for reasons other than methane liberation. Criteria should define when section 103(i) inspections are required at a mine where there exists "some other especially hazardous condition." The PPM also should be revised to define the degree of injury resulting from an ignition or explosion that would require section 103(i) inspections.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives, CMS & H and M/NM will revise the Program Policy Manual to address this issue.	12/31/2013
Section 103(i) Spot Inspections	The Administrator for Coal should collaborate with the Director of PEIR to revise the General Coal Mine Inspection Procedures and Inspection Tracking System handbook to: Include procedures for inspectors to use the IPAL to upload air sample collection data; Define when inspectors are to collect TL air samples consistent with guidance in the Coal Mine Safety and Health Supervisor's Handbook. In addition guidance should address sample collection timing with respect to coal production and major air changes; Define situations where more precise methods are to be used for measuring air velocity and provide instruction on how to take them; Include checks for compliance with 30 CFR 75.400 and 75.403 in the listing of inspection activities that can be conducted during section 103(i) spot inspections at mines selected for such inspections due to excessive methane liberation, methane hazards, or ignitions; and Direct inspectors to review each item on the Mine Information Form for completeness and accuracy during a regular inspection. This should include instructions for when and how to update the form.	This is included the Evaluation of Enforcement Policies and Procedures directed by Assistant Secretary Main on July 21, 2010, which is well underway. All of the policies and procedures have been collected and identified, and during the week of January 17, 2012, AS Main created a Task Force to begin the next phase to be overseen by the Deputy Assistant Secretary for Operations. The next phase is the review of the draft handbook and the development of a final handbook for inspectors to use. The final handbook is also to include any additional procedure and policy changes as identified in the internal review report that need to be included PEIR will collaborate with Coal to ensure that the General Coal Mine Inspection Procedures and Inspection Tracking System Handbook as well as the IPAL users guide include procedures for inspectors to upload air sample collection data into IPAL.	12/31/2012
Section 103(i) Spot Inspections	PEIR should complete revisions to IPAL to provide data-entry validation and permit inspectors to upload air sample collection data directly to the enterprise database for integration with the LIMS.	IPAL coding changes to upload air sample collection data has been completed. Union notification occurred on February 15, 2012. PEIR is awaiting Union acceptance to begin implementation of this IPAL modification.	3/31/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Section 103(i) Spot Inspections	The Director of Tech Support will take the lead and collaborate with the Director of PEIR should complete planned upgrades to the National Air and Dust Laboratory to replace outdated equipment and computer systems and integrate the Laboratory Information Management System (LIMS) into the MSHA enterprise database.	Effective June 1, 2011, the management and operation of the National Air and Dust Laboratory (NADL) was transferred from CMS&H to Technical Support. It is being incorporated into the Pittsburgh Safety and Health Technology Center (PSHTC) as a new Division. This laboratory processes approximately 50,000 inspector rock dust samples for Total Incombustible Content (TIC) and 40,000 mine gas samples per year. The assigned goal is to decrease the turn-around-time (TAT) and eventually receive accreditation by a nationally recognized body. Currently, the staffing of the laboratory has been increased by 3 contract employees (an increase of 10 FTE is planned for FY-2012). New equipment has been procured and implemented to a limited extent. A local area network (LAN) was installed including a complete computer system upgrade. Through MSHA funding, a general upgrade to the physical site (space renovation, increased HVAC) has been designed by GSA, and construction is scheduled to begin in April 2012. The integration of the NADL data system, the Pittsburgh Laboratory Information System (LIMS), and MSHA's Standardized Information System (MSIS) is on-target and is consistent with the contemplated changes of MSIS for CMS&H. Further improvements to meet the assigned goals are dependent on the completion of the laboratory physical site upgrade which is targeted for Aug 2012.	12/31/2012
Use of Enforcement Authority Provided by Section 104 of the Mine Act	The Administrators should collaborate with the Associate Solicitor to revise the Citation and Order Writing Handbook for Coal Mines and Metal and Nonmetal Mines to provide a clear evaluation process for inspectors to determine gravity and negligence for each relevant item on the Mine Citation/Order Form. This direction should include definitions for each level of likelihood listed on the Form. The revised Handbook also should incorporate definitions for the levels of negligence that are consistent with those listed in 30 CFR Part 100 and clearly incorporate the meaning of "mitigating circumstances."	SOL guidance on this issue is pending. Once received, and consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives, CMS & H and MNM will begin efforts to address these recommendations.	6/30/2013
Use of Enforcement Authority Provided by Section 104 of the Mine Act	The Administrators for Coal and M/NM should direct the revision of their general inspection procedure handbooks to move note-taking instructions related to enforcement actions to the Citation and Order Writing Handbook for Coal Mines and Metal and Nonmetal Mines. The Handbook should direct inspectors to document both facts necessary for evaluating compliance, gravity, and negligence and the logic for deriving conclusions from such facts. Inspectors should identify in their notes the records (specific to the record type, dates, and relevant information from such records) used as a factor to determine negligence for each violation.	This is included the Evaluation of Enforcement Policies and Procedures directed by Assistant Secretary Main on July 21, 2010, which is well underway. All of the policies and procedures have been collected and identified, and during the week of January 17, 2012, Assistant Secretary Main created a Task Force to begin the next phase to be overseen by the Deputy Assistant Secretary for Operations. The next phase is the review of the draft handbook and the development of a final handbook for inspectors to use. The final handbook is also to include any additional procedure and policy changes as identified in the internal review report that need to be included. M/NM has established a handbook committee to update and revise all handbooks, including its general inspection procedures. That handbook will be revised to address the issue of note-taking instructions.	12/31/2012
Use of Enforcement Authority Provided by Section 104 of the Mine Act	The Administrator for Coal should consider removing the Health/Safety/Other Block from the Mine Citation/Order Form. The Administrator also should consider revising the Citation and Order Writing Handbook for Coal Mines and Metal Mines to remove the direction for Coal inspectors to complete this field. The Director of PEIR should make corresponding changes to the IPAL data input screen.	CMS&H will consider this recommendation and if appropriate, work with PEIR to remove these blocks on the citation and order form.	9/30/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Use of Enforcement Authority Provided by Section 104 of the Mine Act	The Administrator for Coal should direct the revision of the Coal Mine Safety and Health Supervisor's Handbook to provide supervisors with a list of fundamental procedures for reviewing enforcement actions. The Handbook should also direct assistant district managers to routinely review a representative number of enforcement actions for conformity to these procedures. Managers should review a representative number of extensions to citations to ensure that inspectors provide specific reasons for extending termination due times that give primary consideration to the health and safety of miners and are not for the convenience of the mine operator or MSHA.	Guidance will be provided to supervisors and managers through either face-to-face or VTC training on the proper review of inspection reports and enforcement actions. Key indicator reports are reviewed at the District and the HQ level on outstanding violations that are not abated. Managers at the district level will be trained to address extensions and assure that extensions are warranted. Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, CMS&H will revise the Coal Mine Safety and Health Supervisor's Handbook to provide supervisors with a list of procedures for reviewing enforcement actions.	9/30/2012 12/31/2013
Use of Enforcement Authority Provided by Section 104 of the Mine Act	The Director of Educational Policy and Development should direct the revision of training programs for citation and order writing as needed to reflect changes in policies and procedures. The training should be provided to all enforcement personnel, supervisors and managers. Knowledge checks should be used to determine the effectiveness of the training.	EPD will work with the Deputy Assistant Secretary for Operations to put a procedure in place ensuring that training programs for all enforcement personnel, supervisors and managers on citation and order writing incorporate in a timely fashion, all changes in new policies and procedures, including regulatory changes. EPD will also develop refresher on-line training for inspectors on citation and order writing. Knowledge checks will be used to determine the effectiveness of the training.	6/30/2013 7/31/2012
Use of Enforcement Authority Provided by Section 104 of the Mine Act	The Director of PEIR should direct modifications to IPAL to automatically insert the following statement into the Condition or Practice for each section 104(d) action: "This violation is an unwarrantable failure to comply with a mandatory standard."	IPAL will be modified to automatically insert text for section 104(d) violations with minimal development time.	3/31/2012
Assessment of Civil Penalties	SOL and the Administrators for Coal and Metal and Nonmetal should collaborate to revise the Citation and Order Writing Handbook for Coal and Metal and Nonmetal Mines to incorporate applicable provisions from PIL I08-III-02. The handbook should: define the term "substantial and proximate cause" and explain the inspector's role, if any, in the evaluation; Include instructions that clearly direct inspectors and specialists to complete a SAR form for each violation that meets the numbered objective criteria for screening potentially flagrant violations. The second scenario in the "Flagrant Citations and Orders" chapter of the Handbook should reference whether the example should be reviewed as a potentially flagrant violation; and direct inspectors and specialists to include a SAR form in the packet to be sent to the District Office for each violation meeting the objective flagrant criteria.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, CMS&H and MNM will work with SOL to issue a new Procedure Instruction Letter and the Citation and Order Writing Handbook will be revised to address this recommendation.	12/31/2013
Assessment of Civil Penalties	The Administrator for Coal should consult with the District Managers to determine whether additional staffing is sufficient to address section 110(c) special investigation demands, particularly at highly noncompliant mines.	The Administrator will consider more positions within the special investigations branch on an as needed basis as the budget allows.	6/30/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Assessment of Civil Penalties	The Administrator for Coal and MNM should collaborate with SOL and the Director of the Office of Assessments, Accountability, Special Enforcement and Investigation (OAASEI) to revise Volume III of the Program Policy Manual to define a "potentially flagrant violation" using the numbered objective criteria referenced in the Citation and Order Writing Handbook for Coal and Metal and Nonmetal Mines; Add "potentially flagrant violations" to the list of violations that are required to be reviewed for special assessment. The matrix that follows the list also should be clarified to include potentially flagrant violations; Explicitly require that all SAR Forms for potentially flagrant violations be submitted to the Administrator along with supporting documentation, even if the District Manager does not recommend a flagrant violation special assessment because of the perceived absence of substantial and proximate cause or the presence of mitigating factors; include the Potential Flagrant Violations Not Assessed oversight report with reference to the Assessable Violations Not Marked Report (R 119 Report) for regular review by district personnel; update guidance on legal requirements for implementing assessments of flagrant violations, including whether repeat flagrant violations must be related to the same distinct hazard.	Consistent with the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, Coal, MNM, OAASEI and SOL will collaborate to revise Volume III of the PPM to address flagrant violation issues in the internal review report. These revisions will include each of the five recommended changes enumerated in this recommendation.	12/31/2013
Proposed Assessment of Civil Penalties	The Administrators for Coal and Metal and Nonmetal, the Director of OAASEI, and the Director of PEIR should collaborate in developing a management tool to monitor the resources districts devote to special investigations.	Coal/MNM/OAASEI will collaborate with PEIR to develop a tool to monitor special investigation resources using the DOL-required System Design Lifecycle Management to process. Coal/MNM/OAASEI in consultation with PEIR will develop the business requirements and PEIR will develop the tool. Using data currently available in MSIS, reports and key indicators will be developed to monitor time and activity reported against special investigation events.	7/31/2012
Assessment of Civil Penalties	The Administrator for Coal should Direct Districts 4 and 12 managers to require their SSIs to prepare and maintain a memorandum detailing the reasons for not conducting a special investigation in cases where the district manager decides to take no further action, in accordance with the Special Investigations Procedures Handbook.	The CMS&H Administrator will instruct D4 and D12 to require their SSIs to prepare and maintain a memorandum detailing the reasons for not conducting special investigations.	4/30/2012
Enforcement of Section 103(a) of the Mine Act	The Administrators for Coal and Nonmetal should consult with the Office of the Solicitor to revise the Program Policy Manual to address actions by operators, their agents, or their employees that constitute advance notice of inspections for the purposes of section 103(a). The Manual explicitly should instruct that section 103(a) is violated when an operator impedes an inspection by giving advance notice of MSHA's presence on mine property to outlying surface and underground facilities, regardless of whether the inspection already has commenced or whether the inspector explicitly has warned the operator against providing such notice.	On August 26, 2010, MSHA issued PIB P10-15 to remind operators, miners' representatives, MSHA personnel and other interested parties that Section 103 of the Mine Act prohibits advance notice. The Administrators will consult with SOL and instruct District Managers regarding advance notice of inspectors to address this recommendation. Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives, Coal will revise the Program Policy Manual to address actions that constitute advance notice of inspections.	6/30/2012 12/31/2013
Enforcement of 30 CFR 48.3	The Administrator for Coal should direct that District 4 and 12 managers reinforce MSHA policy and procedure concerning standards that can be cited as section 104(g)(1) training orders and on records that must be inspected to ensure that an operator is providing all required training.	This will be addressed during the April 2012 training of all coal inspectors and specialists, including D4 and D12 personnel.	4/30/20102

Section	Recommendation	Corrective Action	Expected Completion Date
Proposed Assessment of Civil Penalties	The Administrators for Coal and Metal and Nonmetal and the Director of OAASEI should revise the Program Policy Manual and the Special Investigations Procedures Handbook to be consistent with the procedures and instructions contained in the Citation and Order Writing Handbook for Coal and Metal and Nonmetal Mines pertaining to possible knowing and/or willful violation reviews. Instructions for completing MSHA Form 7000-20 should be included in the Citation and Order Writing Handbook for Coal and Metal and Nonmetal Mines.	OAASEI will take the lead in revising the Program Policy Manual and Special Investigations Procedures Handbook to be consistent with the applicable sections of the Citation and Order Writing Handbook. In addition, OAASEI will revise MSHA Form 7000-20 and the instructions for completing the form and will work with Coal and MNM to include these instructions in the Citation and Order Writing Handbook. Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives, OAASEI will work with Coal and MNM will to include these instructions in the Citation and Order Writing Handbook. Consistent with the Deputy Assistant of Secretary for Operations development of a draft centralized administrative review process for Directives, Coal, MNM, OAASEI and SOL will revise Volume III of the PPM to address flagrant violation issues identified in the internal review report.	12/31/2012 12/31/2013
Enforcement of Section 103(a) of the Mine Act	The Administrators for Coal and Metal Non Metal should direct the revisions of their general inspection procedures handbooks to be consistent with the revisions to the Program Policy Manual regarding enforcement of 103(a).	Coal's revisions to its general inspection procedures handbook is included the Evaluation of Enforcement Policies and Procedures directed by As Main on July 21, 2010, which is well underway. All of the policies and procedures have been collected and identified, and during the week of January 17, 2012, Assistant Secretary Main created a Task Force to begin the next phase to be overseen by the Deputy Assistant Secretary for Operations. The next phase is the review of the draft handbook and the development of a final handbook for inspectors to use. The final handbook is also to include any additional procedure and policy changes as identified in the internal review report that need to be included. MNM has established a handbook committee to update and revise its general inspection procedures handbook. Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives, Coal and MNM will take the lead to ensure that revisions to their general procedures handbooks are consistent with revisions to the Program Policy Manual.	12/31/2012 12/31/2013
Enforcement of 30 CFR 48.3	The Administrator for Coal should collaborate with EPD to update the training programs for entry-level and journeyman inspectors to emphasize the value of a purposeful examination of training records and to guide inspectors on how to effectively determine compliance with Part 48 and other training requirements. The guidance in CMH&S Memo No. HQ-08-055-A that directs inspectors to question miners on their training related to roof control plans and document such information should also be addressed in this training.	CMS&H will collaborate with EPD on enhancing inspector knowledge on training record examinations and compliance with other training requirements including Part 48. This will also be addressed during the April 2012 training for all coal inspectors and specialists, including D4 and D12 personnel and entry-level CMI training classes.	6/30/2012
Enforcement of 30 CFR 75.360, 362, 363, 364	The Administrator for Coal should direct the revision of the Coal Mine Safety and Health Supervisor's Handbook to require supervisors to check a representative number of examination books during Accompanied Activities to determine compliance with the mandatory safety standards pertaining to the recording of the results of pre shift, on shift and weekly examinations.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations development of a draft centralized administrative review process for Directives, the Administrator for Coal will direct revisions to the Coal Mine Safety and Health Supervisor's Handbook regarding records review by supervisors of pre-shift, on-shift and weekly examinations.	12/31/2013

Section	Recommendation	Corrective Action	Expected Completion Date
Enforcement of 30 CFR 48.3	The Administrator for Coal should direct the District 4 and 12 Managers to develop and follow a process for ensuring that operators submit revised plans when requested, and taking appropriate enforcement actions when operators fail to do so.	This will be addressed during the April 2012 training for coal inspectors and specialists, including D4 and D12 personnel.	4/30/20102
Enforcement of 30 CFR 48.3	Educational Policy and Development should evaluate the feasibility of requiring a representative number of independent contractor training classes to be monitored by the Educational Field Services group. The Assistant Secretary should consider making some EFS specialists authorized representatives to assist in inspection of training records and establish protocol for coordinating with District Managers to provide these services when needed.	The CMS&H Administrator will issue a memo to District Managers requiring them to notify all operators and entities with approved training that annual and new miner training schedules must be provided to the Districts, 2 weeks prior to the training. The DMs will refer the training schedule notifications to EPD/EFS. EFS is developing procedures to ensure resources are made available to monitor a representative number of Part 48 approved instructors. EPD/EFS will monitor instructors, especially contract trainers, to ensure the training is appropriate and effectively delivered.	4/30/2012
Enforcement of 30 CFR 75.220(a)(1)	The Administrator for Coal should revise the General Coal Mine Inspection Procedures and Inspection Tracking Handbook to include a statement that approved plans for the first panel in a longwall district are often unique. Inspectors should review these plans carefully and focus on compliance with these requirements during inspections of longwalls.	Coal's revisions to its general inspection procedures handbook are included the Evaluation of Enforcement Policies and Procedures directed by Assistant Secretary Main on July 21, 2010, which is well underway. All of the policies and procedures have been collected and identified, and during the week of January 17, 2012, Assistant Secretary Main created a Task Force to begin the next phase to be overseen by the Deputy Assistant Secretary for Operations. The next phase is the review of the draft handbook and the development of a final handbook for inspectors to use. The final handbook is also to include any additional procedure and policy changes as identified in the internal review report that need to be included.	12/31/2012
Enforcement of 30 CFR 75.220(a)(1)	The Administrator for Coal should direct the revision of the Uniform Mine File Handbook to clarify what sections of the UMF that inspectors and specialists must review for a “limited inspection” as described in the handbook. At a minimum, the roof control and ventilation plans and any other plans pertinent to that inspection should be reviewed. This revision should also clarify what constitutes a “limited inspection” as described in the handbook. Note: The draft handbook has this provision in it but the provision could go in the UMF as well.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop of a draft centralized administrative review process for Directives, the Uniform Mine File Procedures Handbook will be revised to clarify sections of the UMF that inspectors and specialists must review for a limited inspection. In the interim, the Administrator for CMS&H will instruct District Managers on what constitutes a limited inspection for review.	12/31/2013
Enforcement of 30 CFR 75.351 and 75.352	The Administrator for Coal should direct the committee revising the Carbon Monoxide and Atmospheric Monitoring Systems Inspection Procedures Handbook to identify the salient parts of an AMS or CO system inspection. The CO Handbook should describe how an inspector would conduct an inspection to address each salient part to determine the system is being operated and maintained in compliance with the appropriate safety standards. Any portions of the system inspection that require an electrical specialist attention should be clearly identified.	The Administrator for Coal will instruct the Committee to revise the AMS/CO Handbook to include the salient parts of an AMS or CO inspection, so long as this is consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives.	6/30/2013
Enforcement of 30 CFR 75.400 and 75.403	The Administrator for Coal should revise the PPM for 30 CFR 75.400-2 to clarify that the cleanup program required by this standard also applies to methods for preventing accumulations of coal and coal dust on retreating sections, including longwalls. Policy should provide strategies for requiring operators to revise deficient cleanup programs or identify other enforcement incentives that can be used when operators fail to comply with their programs.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations development of a draft centralized administrative review process for Directives, the PPM for 75.400-2 and 75.402 will be revised to clarify issues relating to the clean-up program.	12/31/2013

Section	Recommendation	Corrective Action	Expected Completion Date
Enforcement of 30 CFR 75.360, 362, 363, 364	The Administrator for Coal should collaborate with the Director of EPD to revise the curriculum at the National Mine Health and Safety Academy regarding inspection procedures for evaluating operator compliance with examination standards. The training should explain the purpose and utilization of an inspector's review of mine examination records. This training should be provided to entry-level inspectors, journeyman inspectors, specialists, supervisors and ADMs. The training should provide instructions on: • Determining whether adequate examinations have been conducted; determining whether the operator has recorded in the examination book the specific corrective action taken to eliminate the hazard • Identifying incomplete records of examinations, including missing air quantities and air quality measurements. • Using examination records to aid in the enforcement of 30 CFR 75.360, 75.362, 75.363, and 75.364. • Traveling with and evaluating at least one preshift examiner, one on-shift examiner, and one weekly examiner during each regular inspection; • determining whether the operator conducted on-shift examinations of dust control parameters • Using examination records in the evaluation of operators' negligence for violations of other safety and health standards.	Academy personnel, has for the past several months, been working on a revision of the curriculum concerning 75.364 to address the purpose and utilization of an inspector's and supervisor's review of mine examination records. The training will be included in the journeyman, specialist, supervisory and entry-level training.	8/31/2012
Enforcement of 30 CFR 75.400 and 75.403	The Director of Tech Support will take the lead and collaborate with the Administrator for Coal and NIOSH to develop a standard method for collecting a mine dust sample for operators and inspectors to use to determine compliance with 30 CFR 75.403. The Agency should consider recent research regarding sample collection methodology, including that related to sample depth and elevated surfaces.	Recent NIOSH research has suggested possible changes to the longstanding band sampling method which has historically been used by CMS&H. For instance, information has been presented in various NIOSH publications suggesting sampling of ⅛ to ¼ inch from the mine floor. NIOSH has also mentioned possible plug samples as an alternative or supplement to band samples during recent discussions. Ultimately, the true measure of the validity of a sampling procedure is how well it correlates with explosion test results. This is information that only NIOSH can address through their extensive body of research, laboratory, and large-scale testing. The CMS&H Administrator will issue a memo to Technical Support requesting their assistance and guidance. Tech Support recommends that AS Main draft a letter to NIOSH to recommend an appropriate and practical rock dust sampling procedure and methodology for inspectors or operators to use which will ensure the proper detection of potentially hazardous conditions in underground coal mines.	6/1/2012
Enforcement of 30 CFR 75.1725(a)	The Administrator for Coal should direct revision to the Program Policy Manual to establish policy for determining compliance with 30 CFR 75.1725(a) as it relates to damaged or missing cutting bits, bit lugs, or bit lug inserts on continuous mining machines and longwall shearers.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations to develop a draft centralized administrative review process for Directives, the CMS&H Administrator will develop guidance to the District Managers determining compliance with 30 CFR 1725(a) as it relates to bits. The Program Policy Manual will be revised for 30 CFR 75.1725(a) as it relates to damaged or missing cutting bits, bit lugs, or bit lug inserts on continuous mining machines and longwall shearers.	12/31/2013

Section	Recommendation	Corrective Action	Expected Completion Date
Enforcement of 30 CFR 75.400 and 75.403	The Director of PEIR should provide the following to enhance 30 CFR 75.403 enforcement and minimize rock dust data input errors: • The RDSS and RDDR applications should be incorporated into IPAL and MSIS. • The Rock Dust Sample Submission Form and the MSHA enterprise database should be modified to include fields to document the location of the last row of samples collected during rock dust surveys. • Lab analysis reports should be modified to include surveys where no samples were submitted for analysis (e.g., all wet sample locations) to confirm data transfer. Such documents should be included in inspection reports, consistent with current MSHA inspection procedures, rather than Rock Dust Sample Submission Forms. • Standard oversight reports should be developed and distributed to headquarters, district, and field offices to monitor: o Rock dust surveys with no samples collected, including surveys containing all "No Sample" or "Wet" locations. o Sample collection rates from previously wet locations for each underground bituminous coal mine. o Non-compliant spot rock dust samples with no subsequent enforcement actions. This may require additional fields on the Rock Dust Sample Submission Form showing the purpose for collecting a spot sample (i.e., previously wet sample location, violation abatement sample, or compliance sample).	PEIR has been working diligently over the last eight months with Technical Support and Enforcement on this effort. The team is currently working to deploy Air Gas Samples within MSIS first as outlined by the stakeholders. PEIR is anticipating a deployment date for Rock Dust (including the Rock Dust Sample Submission Form) in MSIS in April 2013. PEIR estimates that the RDSS and RDDR applications will be implemented in IPAL April 2013. The standard oversight reports will not be developed until the above changes are implemented in MSIS and IPAL.	8/15/2013
Enforcement of Electrical Standards	The Assistant Secretary should instruct the Directors of EPD and Tech Support to develop and provide advanced technical training on longwall mining equipment. The training should be provided to MSHA regular inspectors who are qualified electricians and electrical specialists Agency-wide.	MSHA provides training to all entry-level coal inspectors on high voltage longwall equipment. Upon instructions from the Assistant Secretary, the Director of Technical Support will work with the Director of EP&D to develop and provide advanced technical training on longwall mining equipment for MSHA inspectors who are qualified electricians and electrical specialists. This training will be provided Agency-wide.	9/1/2012
Enforcement of Electrical Standards	The Administrator for Coal should revise the General Coal Mine Inspection Tracking System Handbook to direct electrical or permissibility inspections of longwall systems to be conducted by electrical specialists or inspectors who hold a current MSHA electrical qualification card.	This is included the Evaluation of Enforcement Policies and Procedures directed by As Main on July 21, 2010, which is well underway. All of the policies and procedures have been collected and identified, and during the week of January 17, 2012, Assistant Secretary Main created a Task Force to begin the next phase to be overseen by the Deputy Assistant Secretary of Operations. The next phase is the review of the draft handbook and the development of a final handbook for inspectors to use. The final handbook will also include any additional procedure and policy changes identified in the internal review report. The Administrator has directed inter-district training for CMIs from D4 and D12 to travel and inspect at other Longwall Districts. Training will be given to both electrical and non-electrical inspectors on how to conduct permissibility inspections on longwalls.	12/31/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Enforcement of Electrical Standards	The Administrator for Coal should collaborate with the Directors of EPD and Technical Support to provide refresher training for District 4 and 12 regular inspectors to assure that they have appropriate skills to ensure uniform recognition of existing electrical violations.	The CMS&H Administrator will request Technical Support and EPD assistance on refresher training on electrical violations. To be addressed during April 12, 2012 training for all coal personnel, including D4 and D12 personnel.	4/30/20102
Mine Plan Approvals	The Administrator for Coal should direct staff to audit the District 4 and 12 ventilation plans to determine whether the methane and dust control plans have been incorporated into the mine ventilation plans, subject to a single review date.	The Administrator for Coal will direct the safety division to conduct audits of the District 4 and 12 ventilation plans to determine whether the methane and dust control plans have been incorporated into the mine ventilation plans, subject to a single review date.	10/1/2012
Mine Plan Approvals	The Administrator for Coal should direct District 4 and 12 managers to provide inspectors and specialists with training to ensure that six-month reviews are conducted and documented in accordance with the Mine Ventilation Plan Approval Procedures Handbook. The District Managers should monitor the six-month reviews after the training is completed to verify its effectiveness and take follow-up corrective action if necessary.	This will be addressed during April 2012 training for all coal inspectors and specialists, including D4 and D12 personnel. Inspectors and specialists will also be provided training regarding the conduct and documentation of six-month reviews of ventilation plans.	4/30/20102
Mine Plan Approvals	The Administrator for Coal should direct the District 4 and 12 Managers to revise SOPs [should hold the ADM – Technical accountable] to ensure that both the Health and Ventilation departments contribute to the correspondence sent to mine operators after each six-month ventilation plan review.	SOP revisions will be completed by June 30, 2012 and follow-up will be addressed in the Performance Management System and Accountability Reviews.	6/30/2012
Mine Plan Approvals	The Administrator for Coal should direct the revision of the Program Policy Manual to provide guidance on when it is appropriate to cite an operator for a violation of 30 CFR 75.372(a) or (b) when it fails to submit an up-to-date and complete mine ventilation map. The Administrator should also direct the revision of the Mine Ventilation Plan Approval Procedures Handbook to implement the revised policy.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, the Mine Ventilation Plan Approval Procedures Handbook and the Program Policy Manual will be revised to provide guidance on when it is appropriate to cite an operator for a violation of 30 CFR 75.372(a) or (b) when it fails to submit an up-to-date and complete mine ventilation map.	12/31/2013
Mine Plan Approvals	The Administrator for Coal should direct revisions to the Program Policy Manual to apply reduced respirable dust standards including those from deactivated MMUs to other MMUs working in the same section of the mine with similar mining equipment, until sampling establishes a new standard.	The policy governing the establishment of MMU numbers contained in 70.207 will be modified to indicate that the respirable dust standard due to the presence of quartz will continue when equipment on the MMU is changed. This particular provision of the Program Policy Manual is being revised and is in the process for review and approval, subject to the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives.	6/30/2013
Mine Plan Approvals	The Administrator for Coal should direct revisions to the Mine Ventilation Plan Approval Procedures Handbook to specify that ventilation specialists conduct the physical inspection portion of the six-month ventilation plan reviews for mines with complex ventilation systems, such as those with longwall mining.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, the Administrator for Coal will direct revisions to the Mine Ventilation Plan Approval Procedures Handbook to specify that ventilation specialists conduct the physical inspection portion of the six-month ventilation plan reviews for mines with complex ventilation systems, such as those with longwall mining.	12/31/2013
Mine Plan Approvals	The Administrator for Coal direct staff to monitor the implementation of the new regulations to ensure Districts enforce the provisions of final rules within the effective dates specified.	The Administrator will direct staff to monitor the implementation of new rules/regulations through FARs, AA, Second Level reviews, and District Peer reviews.	4/30/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Mine Plan Approvals	The Administrator for Coal should direct the revision of the Mine Ventilation Plan and Approval Procedures Handbook to require pertinent accident reports and technical studies to be maintained in the appropriate department active mine file to ensure that relevant historical information is available to specialists and supervisors. Consideration should also be given to including this information in the active mine file of other mines with similar seam and geological conditions.	The CMS&H Administrator will instruct districts to create a new file to include accident reports and technical studies and to retain these documents in the mine file as part of the mine ventilation plan and supplements reviews. Consistent with the Assistant Secretary's instructions to the Deputy Assistant of Secretary for Operations development of a draft centralized administrative review process for Directives, the Administrator for Coal will direct revisions to the Program Policy Manual regarding reduced respirable dust standards.	12/31/2013
Mine Plan Approvals	The Administrator for Coal should direct that training be provided to appropriate Coal personnel on the Agency policy requiring reduced standards on deactivated MMUs to be continued with newly-activated MMUs. The training should include instruction on the revised guidelines of the Mine Ventilation Plan and Approval Procedures Handbook.	Chapter 1 of the Health Inspection Procedure Handbook is being revised to (1) clarify the application of the reduced standards to MMUs and (2) clarify the abatement time for excessive dust citations. This requirement has been communicated to the districts multiple times during health supervisor meetings. Training will be provided to all District Health Supervisors on the 70.207 policy.	6/30/2013
Mine Plan Approvals	The Administrator should collaborate with the Director of EPD to provide instruction on bleeder system evaluations during biannual retraining of all underground enforcement personnel and supervisors.	The CMS&H Administrator and the Director of EPD will collaborate on providing periodic retraining on bleeder system evaluations to Coal underground enforcement personnel, including supervisors and managers. Training will be provided for supervisors by October 2012 and all enforcement by July 2013. Seals and Bleeders training is part of the FY 2011-2012 Journeyman Coal Mine Inspectors curriculum and will be given to all Journeyman inspectors by the end of this fiscal year. Bleeder evaluation training is provided to all coal entry level inspectors in the Ventilation II course that is required prior to graduation from the program. Bleeder evaluation training will also be part of upcoming Coal Supervisors training, currently in development.	6/30/2013 3/31/2013
Mine Plan Approvals	The Administrator should direct that a Roof Control Plan Approval handbook be developed to consolidate the numerous PILs, PIBs, and CMS&H memoranda. This will provide plan reviewers with a discrete set of guidelines and instructions for evaluating and processing roof control plans. The handbook should specify that correspondence between the coal operators and plan reviewers be maintained as part of the plan approval record. This should include procedures for tracking responses due from operators following MSHA requests for plan revisions.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, CMS&H will develop, issue and implement a Roof Control Plan Approval Handbook to address this recommendation.	12/31/2013
Mine Plan Approvals	The Administrator should direct the District 4 and 12 managers that the roof control plan SOP be revised to comply with the established Program Policy Manual requirements as identified by the OIG Report.	The CMS&H Administrator will direct the D4 Manager (with instructions) to revise the roof control plan SOP to comply with the PPM requirements.	4/30/2012
Mine Plan Approvals	The Administrator should direct District 4 and 12 Managers to provide training to inspectors and specialists regarding the use of the required checklists and proper documentation of six-month plan reviews.	This will be addressed during April 2012 training for coal inspectors and specialists, including D4 and D12 personnel.	4/30/2012
Mine Plan Approvals	The Administrator should direct District 4 and 12 Managers to ensure that the six-month reviews of roof control plans for complex mines are conducted by roof control specialists as required. When deemed appropriate, complex mine plans should continue to be forwarded to Technical Support for evaluation.	PIL I11-V-01 provides instructions that the six-month reviews of roof control plans for complex mines are conducted by the roof control specialists as required, and that complex plans should be forwarded to Technical Support as appropriate for evaluation. This corrective action is completed.	N/A

Section	Recommendation	Corrective Action	Expected Completion Date
Mine Plan Approvals	The Administrator for Coal should revise the Program Policy Manual to: Establish policy for 30 CFR 75.1716 to define the manner in which mine operators must provide notice to the district manager prior to the commencement of mining operations when planning to mine under any river, stream, lake or other body of water. The policy should also state that other body of water includes water pools in overlying mines. • Clearly state the Agency's interpretation of "water pools above," as referenced in 30 CFR 75.1200(j), by explicitly stating that the phrase "water pools above" includes water pools in overlying mines; • Instruct district personnel to request that an operator identify pools of water in overlying mines where applicable when submitting mine ventilation maps; clarify the detail to be shown on mine ventilation maps to include elevations on 10-foot contours in overlying and underlying mines when elevations are available on overlying or underlying mine maps • Direct district managers to exercise their authority under 30 CFR 75.1203 to require operators furnish a current 30 CFR 75.1200 mine map at the same time that the current mine ventilation map is submitted in accordance with 30 CFR 75.372(a)(1). Both maps should be updated as of the same date.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, the Program Policy Manual will be revised accordingly.	12/31/2013
Respirable Dust at Upper Big Branch Mine	The Administrator for Coal should direct revisions to the PPM to: clarify when it is appropriate to establish a new MMU number, including situations when mining equipment is replaced with similar machinery. Policy should clearly explain procedures for assigning respirable dust standards when a new MMU is approved to account for the mine's history of reduced respirable dust standards and expected geological conditions; Clarify application of 30 CFR 70.207(a) as it relates to the collection of bimonthly samples by mine operators and provide training on the revised policy. This policy should provide guidance on when an MMU has operated a sufficient number of days during the bimonthly period to warrant operator sampling; Establish criteria for determining abatement times for citations issued for exceeding respirable dust standards; and Provide consistent guidance between Section 1.103-4 and the Coal Mine Health Inspection Procedures Handbook; Revisions should clarify when MSHA will collect respirable dust samples on each operating MMU and state that invalid or voided samples do not meet this obligation.	CMS&H will modify Chapter I "Respirable Dust" in the Health Inspection Procedures Handbook to specify when MMU numbers may be changed and what historical information such as the reduced dust standard due to quartz must be continued even when a new MMU number is generated. In addition, consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, the PPM will be revised to clearly state the requirement to collect valid respirable dust sample as part of a complete inspection.	6/30/2013
Respirable Dust at Upper Big Branch Mine	The Administrator for Coal should direct revisions to MSHA Form 2000-142 to eliminate the reference "Headquarters Only" for Item 7C, and require the serial number of the mining machine(s) and an explicit reference to the section or location in the mine for each MMU to be recorded in the #11 (Remarks) field on the form. The Administrator for Coal should collaborate with EPD to provide training on revised policies for District Health Department Supervisors, Assistant District Managers-Technical, and other appropriate coal personnel. Training should also include procedures for using the revised MSHA Form 2000-142.	MSHA form 2000-142 will be modified in conjunction with the implementation of the new respirable dust computer system scheduled for release in March 2012. The setting of the standard due to percentage of quartz has been available since 1981 to the districts as noted in the instructions for completion of MSHA Form 2000-142. Form 2000-142 has been revised and is being shared with the NCFLL for approval. EPD through the Training Committee will work with CMS&H to ensure the Academy curriculum is up-to-date with all revised policies. Training being developed for potential supervisors will cover changes made based on revised policies.	5/30/2012 7/31/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Respirable Dust at Upper Big Branch Mine	The Administrator for Coal should consider whether it is appropriate to store serial numbers and the section/location designations for each MMU in the MSHA enterprise database.	The new respirable dust computer system scheduled for release in March 2012 has a required field for specifying the location of the MMU.	3/31/2012
Respirable Dust at Upper Big Branch Mine	The Administrator for Coal should direct that training be provided to District 4 and 12 inspectors, specialists, supervisors, assistant district managers, and other appropriate personnel on proper procedures for conducting, documenting, and reviewing MSHA respirable dust surveys.	Training has been provided to all district health supervisors on the conduct, documentation and review of respirable dust surveys during multiple national health supervisor meetings. This will also be addressed during the April 2012 training for coal inspectors and specialists, including D4 and D12 personnel.	4/30/2012
Respirable Dust at Upper Big Branch Mine	The Director of PEIR should develop and implement a standard report to track abatement times for respirable dust violations, and the Administrator should direct the Health Division to use the report to monitor district performance.	PEIR will develop the requested report to track abatement times for respirable dust violations. The development is dependent on the successful Samples COBOL Conversion release to allow for the linkage of the sample and the violation. The Administrator for Coal will direct the health division to use the report to monitor district performance.	5/30/2012
Mine Rescue and Recovery	The Administrator for Coal with the assistance of the Chief of Mine Emergency Operations should modify the existing MERD program to train appropriate MSHA personnel in command center duties and responsibilities and established mine rescue protocols. This training should include: how to evaluate the level of acceptable risk to mine rescue teams using all available relevant information; the use of back-up and standby teams; systematic exploration, including "tying in" areas of the mine; communications between mine rescue teams and the fresh air base; re-ventilation of areas affected by explosions; use and evaluation of inert gases; and possible survivors in refuge alternatives.	The CMS&H Administrator will collaborate with the Chief of Emergency Operations to modify existing MERD training to address these recommendations and provide training to managers and supervisors.	11/31/2012
Mine Rescue and Recovery	The Administrators for Coal and MNM should direct revision of the Mine Rescue Instruction Guide to require a "firewall" to prevent personnel who have had personal contact with family members from participating in command center decisions.	CMS&H and MNM administrators will act according to the instructions of the Assistant Secretary in addressing the recommendation to MSHA to revise the Mine Rescue Instruction Guide.	N/A
Mine Rescue and Recovery	The Administrators for Coal and MNM should re-instruct family liaisons to keep a log of significant events. The Administrators should direct revisions revise the instructions in the Headquarters Mine Emergency Response Guidelines and The Accident/Illness Investigations Procedures Handbooks to clarify that notes should be recorded privately away from the areas where families are gathered and at a time that does not disrupt the interaction between the liaisons and the family members.	The CMS&H and MNM Administrators will reinstruct the Family Liaisons to keep a log of significant events and remind them of the handbook instructions.	7/31/2012
Management Issues	The Administrator for Coal should investigate and resolve issues surrounding double-encumbering temporarily vacant positions to maintain experienced staff of enforcement personnel.	The CMS&H Administrator concurs with this recommendation and will explore actions to improve timeliness of promptly filling DM and supervisory vacancies. Once vacancy announcements have been posted and closed, CMS&H will interview and fill vacancies prior to the expiration. However, the Administrator does not have the authority to double encumber.	Ongoing
Management Issues	The Administrator for Coal should direct the revision of the Coal Mine Safety and Health Supervisor's Handbook to instruct direct district managers and supervisors on methods for tracking FARs, AAs, and mine visits to ensure that they are properly completed and documented.	The CMS&H Administrator will instruct DMs to promptly complete and document oversight of the required number of FARs, AAs, and mine visits. Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, CMS&H will revise the Coal Mine Safety and Health Supervisor's Handbook.	12/31/2013

Section	Recommendation	Corrective Action	Expected Completion Date
103(a) Inspections/ Management Issues	Director of EPD should collaborate with the Administrators for Coal and MNM to improve tracking of retraining of inspectors and specialists. The Administrators should provide an annual report to the Assistant Secretary detailing compliance with this policy.	EPD currently has a system to track retraining of inspectors and is working on updating the reports to better reflect the retraining inspectors receive at the Academy. Additionally, EPD will begin working on integrating input screens for use by Coal and MNM to track retraining conducted at other sites and certified by Coal and MNM. After these changes are completed reports on retraining will be available from one reporting system. The estimated completion date for integrating a common tracking system along with tracking journeyman training through the program areas is March 2013.	10/31/2012 3/31/2013
Management Issues	The Director of EPD should collaborate with the Administrators for Coal and Metal and Nonmetal to: revise the APPM to include issue OJT responsibilities guidance; Incorporate OJT responsibilities into journeyman inspector and supervisor training. Develop and develop and provide training for District OJT Coordinators; revise the OJT booklets to include only practical competency stills that need to be demonstrated in the field. The National Mine Health and Safety Academy should track the academic components of entry-level training; demonstration of OJT tasks should be tracked by field personnel.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for directives, EPD will collaborate with Coal and MNM to update the APPM to clarify the duties and responsibilities concerning OJT training. EPD is in the process of incorporating OJT responsibility training into both journeyman and supervisor training. EPD is implementing the electronic tracking of the OJT tasks and will re-train those individuals responsible for the execution of this program.	12/31/2013
Management Issues	The Director of OAASEI should collaborate with the Administrators for Coal and Metal and Nonmetal to revise the Accountability Program Handbook to: • Remove references to accountability reviews led by MSHA Headquarters. • Provide for evaluation of the effectiveness of corrective actions. Where practical, these evaluations should include objective measurements of results and effects of the corrective actions. In cases where training is identified as a corrective action, knowledge checks or equivalent means should be conducted to ensure an adequate understanding of the material.	OAASEI will, in collaboration with Coal and MNM, revise the Accountability Handbook to remove references to MSHA Headquarters accountability reviews, replacing those reviews with those conducted by the Office of Accountability. The Handbook revisions will also contain requirements for Accountability Office reviews to evaluate the effectiveness of corrective actions taken to address previously identified issues.	90 days after Inspector General issues its report
Enforcement of 30 CFR Part 50	The Assistant Secretary should instruct the Director of EPD to provide resources to assist CMS&H conduct additional Part 50 audits. The Assistant Secretary should consider making some EFS specialists authorized representatives to enable them to conduct audits independently of coal inspectors.	EPD will continue to assist CMS&H conduct Part 50 audits on a case-by-case basis.	Ongoing
Enforcement of 30 CFR Part 50	The Administrator for Coal should direct the District 4 and 12 Managers to: reinstruct inspectors in the General Coal Mine Inspection Procedures and Inspection Tracking System Handbook directive to check and document checking Part 50 records during every regular inspection. The DMS should hold inspection supervisors accountable for enforcing compliance with the directive.	This will be included in the training that will be provided to all coal inspectors and specialists, including District 4 and 12 personnel in April, 2012.	4/30/2012
Recurring Issues Identified in Previous Internal Review Reports	In cases where training is identified as a corrective action knowledge checks or equivalent means should be conducted to ensure an adequate understanding of the material. In the "General Conclusion and Recommendations" section of this Report, the Internal Review Team has outlined an approach that could be used for evaluating the effectiveness of corrective action.	CMS&H, MNM and EPD will collaborate on developing an on-line training with knowledge checks.	9/30/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Recurring Issues Identified in Previous Internal Review Reports	The Administrator for Coal should collaborate with the Director of OAASEI to provide a means for evaluation of the effectiveness of corrective actions for deficiencies identified in this report and in future accountability reviews. Where practical, these evaluations should include objective measurements of results and effects of the corrective actions. In cases where training is identified as a corrective action, knowledge checks or equivalent means should be conducted to ensure an adequate understanding of the material. In the "General Conclusions and Recommendations" section of the report, the Internal Review team has outlined an approach that could be used for evaluating the effectiveness of corrective actions implemented to address identified deficiencies.	OAASEI will, in collaboration with Coal and MNM, revise the Accountability Handbook to remove references to MSHA Headquarters accountability reviews, replacing those reviews with those conducted by the Office of Accountability. The Handbook revisions will also contain requirements for Accountability Office reviews to evaluate the effectiveness of corrective actions taken to address previously identified issues. OAASEI will address recommendations from the Office of the Inspector General's ongoing review of the Accountability Program.	90 days after the Inspector General issues its report
Recurring Issues Identified in Previous Internal Review Reports	The Assistant Secretary should direct the Office of Assessments, Accountability, Special Enforcement and Investigations to evaluate implementation of corrective actions resulting from internal reviews during each annual District Review.	OAASEI will take the lead and, in collaboration with Coal and MNM, will revise the Accountability Handbook to include a requirement for Accountability Office reviews to evaluate the effectiveness of corrective actions taken to address previously identified issues, including issues identified during both internal and accountability reviews. OAASEI will also address recommendations from the Office of the Inspector General's ongoing review of the Accountability Program.	90 days after the Inspector General issues its report
Section 103(a) Inspections	The Assistant Secretary should instruct the Director of PEIR to develop, to the extent possible, fillable forms to be used by inspectors when completing approved forms as part of an inspection or investigation. These fillable forms should be incorporated into the IPAL application to allow the inspector to interact with the directives system in a seamless, user-friendly fashion.	PEIR will modify IPAL will pre-populate data such as Event Number, Mine Id, Mine Name and Operator Name, etc. The following forms will be fillable: 2000-34 new, 2000-84 new, 2000-86, 2000-87, 2000-96, 2000-142 new, 2000-146, 2000-207 new, 2000-209, 2000-223, 4000-29, 4000-125a, 4000-127a, 7000-33 new, 7000-34 new, 7000-35 new, ATF Form 5030.5, and ATF Form 5400.5. The expected implementation date is dependent on Union notification and acceptance.	9/30/2012
Enforcement of 48.3/Mine Plan Approval	The Director of PEIR will collaborate with the Administrator of Coal to revise the Mine Plan Approval (MPA) database system to track operator responses to MSHA requests for plan revisions. The Administrator should direct district managers to use MPA to identify responses from operators and take appropriate actions.	The MPA application will be modified to track overdue responses. PEIR will work closely with Coal on further defining requirements for these revisions. The administrator will direct district managers to use Mine Plan Approval (MPA) to identify responses from operators and take appropriate actions.	8/3/2012
Enforcement of 30 CFR 75.351 and 75.352	The Administrator for Coal should also complete a revision of the General Coal Mine Inspection Procedures Handbook to identify those procedures outlined in the CO handbook that are to be completed during each regular inspection.	Coal's revisions to its general inspection procedures handbook is included the Evaluation of Enforcement Policies and Procedures directed by Assistant Secretary Main on July 21, 2010, which is well underway. All of the policies and procedures have been collected and identified, and during the week of January 17, 2012, Assistant Secretary Main created a Task Force to begin the next phase to be overseen by the Deputy Assistant Secretary for Operations. The next phase is the review of the draft handbook and the development of a final handbook for inspectors to use. The final handbook is also to include any additional procedure and policy changes as identified in the internal review report that need to be included.	12/31/2012
Enforcement of 75.400 and 75.403	The Administrator for Coal should direct that training be provided to supervisors on using standard oversight reports to ensure inspectors have valid reasons for not collecting samples, including visiting some areas that inspectors indicated were too wet to sample.	Training will be provided to supervisors on using standard oversight reports to ensure inspectors have valid reasons for not collecting samples, including visiting some areas that inspectors indicated were too wet to sample.	9/30/2012

Section	Recommendation	Corrective Action	Expected Completion Date
Mine Plan Approvals	The Administrator for Coal should direct the revision of the Uniform Mine File Procedures Handbook to require pertinent accident reports and technical studies to be maintained in the Uniform Mine File for the subject mine.	Consistent with the Assistant Secretary's instructions to the Deputy Assistant Secretary for Operations to develop a draft centralized administrative review process for Directives, the Uniform Mine File Procedures Handbook will be revised to require pertinent accident reports and technical studies to be maintained in the Uniform Mine File for the subject mine.	12/31/2013
Mine Plan Approvals	The Administrator for Coal should direct the District 4 and 12 Managers to revise the technical department SOPs to provide for the review of each proposed plan or revision by appropriate technical departments to check for consistency with other plans approved for the mine. A method for documenting this process should be established. These SOPs should direct specialists to maintain a record of all written correspondence with mine operators regarding proposed plan reviews, particularly regarding changes to proposed plans submitted by operators during the review process.	Coal has already directed District 4 and 12 managers to revise the technical department SOPS. Those revisions will be completed by June 30, 2012.	6/30/2012
Mine Plan Approvals	The Administrator for Coal should direct that training be provided to enforcement personnel, including supervisors and managers to apply the policy during inspection of haulage ventilation controls.	All coal inspectors will be trained to inspect ventilation controls when haulage entries are inspected paying particular attention to the maintenance of ventilation controls and including equipment doors are maintained reasonably airtight construction.	6/30/2012
Mine Rescue and Recovery	The Administrators for Coal and MNM should direct the revision the Mine Rescue Instruction Guide to require a "firewall" to prevent personnel who have had personal contact with family members from participating in command center decisions.	CMS&H and MNM administrators will address the recommendation to MSHA to revise the Mine Rescue Instruction Guide.	N/A

Appendix B – Persons Interviewed or Providing Information

CMS&H District 4

William H. Bane	CMS&H Inspector
Daris L. Barker, Jr.	CMS&H Inspector (Roof Control)
Perry D. Brown	CMS&H Inspector
Raymond D. Browning	CMS&H Inspector (Ventilation)
Albert B. Clark	CMS&H Inspector (Ventilation)
Thomas C. Clark	CMS&H Inspector
Jesse P. Cole	District Manager, Retired
Matilda R. Collins	CMS&H Inspector
Gerald L. Cook	Supervisory CMS&H Inspector
Larry E. Cook	Supervisory CMS&H Inspector (Electrical)
Reba A. Crawford	CMS&H Inspector (Health)
Jack A. Dempsey	CMS&H Inspector
Michael T. Dickerson	Staff Assistant
Benjamin C. Dulin	CMS&H Inspector
Clyde Gray, Jr.	CMS&H Inspector (Ventilation)
Robert G. Hardman	District Manager
Franklin D. Hartenstein	CMS&H Inspector (Roof Control)
Michael Haynes	CMS&H Inspector (Ventilation)
Larry Hedrick	CMS&H Inspector
Michael H. Hicks	Supervisory CMS&H Inspector
Richard D. Hosch	Conference & Litigation Representative
Linda G. Hrovatic	Conference & Litigation Representative
James R. Humphrey	Special Investigator
Harold R. Jeffery	CMS&H Inspector (Electrical)
Walter K. Jenkins	CMS&H Inspector
Richard J. Kline	Assistant District Manager - Technical
Gerald Lucas	CMS&H Inspector
Kevin E. Lyall	CMS&H Inspector
Joseph C. Mackowiak	Supervisory CMS&H Inspector (Ventilation)
Luther E. Marrs	Assistant District Manager (Enforcement)
Edward O. Matthews	CMS&H Inspector
Terry Montgomery	Supervisory Chemist
Thomas V. Moore	Supervisory CMS&H Inspector
Brian Morris	CMS&H Inspector (Roof Control)
David Morris	Supervisory CMS&H Inspector
George R. Nelson	CMS&H Inspector
Paul E. Prince	Supervisory CMS&H Inspector (Health)
David E. Rhodes	Supervisory Special Investigator
Ernie Ross	Conference & Litigation Representative
Doy E. Russell	CMS&H Inspector
Lincoln L. Selfe	Assistant District Manager (Enforcement)
Clarence E. Short, Jr.	CMS&H Inspector
Michael W. Shumate	CMS&H Inspector
Keith A. Sigmon	CMS&H Inspector (Ventilation)
Jerome K. Stone	CMS&H Inspector
Jerome F. Stone	CMS&H Inspector (Ventilation)
David L. Sturgill	CMS&H Inspector (Ventilation)
Johnny R. Syner	CMS&H Inspector
Sabian S. VanDyke	CMS&H Inspector
Charles W. Ward	CMS&H Inspector (Health)
Fred D. Wills	Supervisory CMS&H Inspector

Donald E. Winston.....Supervisory CMS&H Inspector (Roof Control)
Michael R. Wooldridge.....Supervisory CMS&H Inspector (Impoundments)

Headquarters
Jay P. Mattos.....Director, Office of OAASEI
Fred H. Menke .....Program Analyst, CMS&H
Kevin G. Stricklin .....Administrator for CMS&H
Robert A. Thaxton .....Division Chief, Health

CMS&H District 3
Robert E. Cornett .....District Manager

CMS&H District 5
Ray McKinney .....District Manager

CMS&H District 7
John M. Pyles.....Assistant District Manager

National Mine Health and Safety Academy
Jon A. Braenovich.....Training Instructor
Richard E. McDorman .....Training Instructor
Edward Newcomb .....Supervisory Training Instructor
Glen Poe.....Training Instructor
William R. Williams .....Training Instructor

Technical Support
George N. Aul.....Geologist
Dennis A. Beiter.....Supervisory Mining Engineer
Melanie D. Calhoun .....Chemical Engineer
Michael Gauna .....Mining Engineer
Jeffery H. Kravitz.....General Engineer (Scientific Dev.)
Sandin E. Phillipson.....Geologist
Clete R. Stephan.....Principal Engineer (Ventilation)
Richard T. Stoltz .....Division Chief (Ventilation)
John E. Urosek .....Chief (MEO)

Mine Emergency Unit
Charles L. Barton .....District 7
Shawn D. Batty .....District 8
Anthony Benton .....District 6
Joshua Brady.....District 3
Virgil F. Brown.....Technical Support
Kenneth Fleming.....District 6
Arthur D. Jackson .....District 7
David Leverknight .....District 2
Fred R. Martin.....EFS
Jeffrey C. Maxwell.....District 3
Clayton E. Sparks.....District 7
William R. Spens .....District 3
Paul H. Sutherland .....District 5
Rodney D. Williams.....District 11

Appendix C – Recommendations for Regulatory Changes

Use of Section 104 Enforcement Authority and Alternative Case Resolution – The Assistant Secretary should consider rulemaking to modify the provisions of 30 CFR Parts 100 and 104 to minimize the effect of the more subjective gravity and negligence determinations on penalty proposals and pattern of violation determinations, without reducing incentive for operators to comply with standards and regulations.

The Assistant Secretary should consider rulemaking to modify the provisions of 30 CFR Part 100 to provide for increased penalties for the failure of mine operators to report accidents, injuries, and illnesses under the provisions of 30 CFR Part 50.

30 CFR 48.3(h) and 48.23(h) – The Assistant Secretary should consider rulemaking that requires instructor applicants to attend a three-day instructor work shop prior to obtaining approval and requires approved instructors to attend an eight-hour instructor workshop every 3 years thereafter in order to maintain their status as approved instructors under Part 48.

30 CFR Part 70 Respirable Coal Mine Dust – The Assistant Secretary should continue to explore the use available technologies, such as the Personal Dust Monitor (PDM), as part of MSHA's comprehensive strategy for reducing miners' exposure to respirable coal mine dust. If appropriate, regulations should be considered to require mine operators to use the PDM to ensure the health of miners is not compromised due to exposures to dangerous levels of respirable coal mine dust.

30 CFR 75.320 – The Assistant Secretary should consider rulemaking to require a record of the calibration of air quality detectors and measurement devices to be made by the person conducting the calibration by the end of the shift when the calibration was conducted and countersigned by the mine foreman or equivalent mine official.

30 CFR 75.325(c)(1) – The Assistant Secretary should consider rulemaking to state that the quantity of air shall be at least 75,000 cubic feet per minute reaching the working face of each longwall. Progressive increases in the minimum quantity should be established according to the mine methane liberation rate or established schedule for spot inspections at 103(i) mines, such as 15, 10, and 5 day spots inspections. Respirable dust compliance is another factor to be consideration for increasing the intake air quantity. A quantity greater than 75,000 cubic feet per minute may be required to be specified in the approved ventilation plan. The following should be removed as part of the revised regulation: "unless the operator demonstrates that a lesser air quantity will maintain continual compliance with applicable methane and respirable dust standards."

30 CFR 75.333(d) – The Assistant Secretary should consider rulemaking to require the use of equipment doors in lieu of permanent stoppings, or to control ventilation within an air course, be subject to approval in the mine ventilation plan. This regulation also should consider a provision which would require all equipment doors installed in travelways utilize an interlock system to ensure only one door can be opened at any time to maintain the separation of air courses.

30 CFR 75.342(a)(2) – The Assistant Secretary should consider rulemaking to require additional methane sensors to be installed along the longwall face and tied into an Atmosphere Monitoring System (AMS) for the mine. These sensors should be placed along the face at various distances and heights to aid in the detection of methane during normal mining and in the event of a methane inundation. These additional sensor locations should be approved by the District Manager in the mine ventilation plan.

30 CFR 75.342(a)(4)(ii) –The Assistant Secretary should consider rulemaking to require methane monitors be calibrated every seven days. In addition, calibration records shall be signed by a qualified electrician and countersigned by the Mine Foreman or equivalent official.

30 CFR 75.351 & 75.1103 – Combine the CO monitoring standards, automatic fire warning device standards (30 CFR 75.1103), and AMS (30 CFR 75.351) standards into a single standard.

30 CFR 75.351 – The Assistant Secretary should consider rulemaking to require an AMS to provide real-time monitoring of methane, carbon monoxide levels, airflow direction, and record quality and quantity of

air at specific points in the mine, such as where air reversals are likely to impact the overall ventilation system, outby loading points, where air courses split, and at certain intervals along the belt.

30 CFR 75.362(d)(iii) – The Assistant Secretary should consider rulemaking to require mining equipment operators to be provided with a multi-gas detector to conduct their required mine atmosphere examinations.

30 CFR 75.362(g)(2) – The Assistant Secretary should consider rulemaking to require that the results of the respirable dust control parameter examination be called out to the surface and recorded in the on-shift examination record book. The record should be countersigned by the mine foremen or equivalent official and mine superintendent or equivalent official.

30 CFR 75.360 - 75.364 – The Assistant Secretary should consider supplementing the present rule making, "Examinations of Work Areas in Underground Coal Mines for Violations of Mandatory Health or Safety Standards," to include second-level countersigning of mine examinations records by a certified mine superintendent or equivalent mine official.

30 CFR 75.360 - 75.364 – The Assistant Secretary should continue the present rule making, "Examinations of Work Areas in Underground Coal Mines for Violations of Mandatory Health or Safety Standards," to require the certified person conducting examinations to examine for violations of mandatory health or safety standards, as well as hazardous conditions, and record the violations and hazardous conditions observed by a certified mine examiner during the course of the examination in the mine examination record book.

30 CFR 75.360 - 364 – The Assistant Secretary should consider rulemaking to require the type and serial number of the multi-gas detectors used during the various mine examinations be recorded with the results of the examination in the record book.

In addition to the signature of the mine examiner, the name of the examiner should be printed legibly alongside the signature.

30 CFR 75.360 - 364 – The Assistant Secretary should consider supplementing the present rule making, "Examinations of Work Areas in Underground Coal Mines for Violations of Mandatory Health or Safety Standards," to require federal certification requirements, procedures, and time limits for re-certification of certified persons (including mine superintendents).

The final rule should provide procedures and criteria for the revocation of certifications (decertification of certified persons) for certain violations, including knowing and willful violations, advance notice of inspections, making any false statement, and smoking or carrying smoking materials.

The rule making process should include collaboration with the state agencies were appropriate.

30 CFR 75.402 – The Assistant Secretary should consider rulemaking to revise 30 CFR 75.402 to require the use of:

- high-pressure rock-dusting machines to continuously apply rock dust into the air stream at the tailgate end of the longwall face whenever cutting coal;
- rock-dusting machines to regularly apply rock dust at the outby edges of active pillar lines on retreating continuous mining machine sections; and
- rock-dusting machines to regularly apply rock dust at approaches to other inaccessible areas downwind of coal dust-generating sources.

30 CFR 75.400 & 75.403 – The Assistant Secretary should consider rulemaking to require mine operators to regularly determine the adequacy of rock dusting using a method approved by the Secretary. This could be achieved by requiring mine operators to sample mine dust for analysis or conduct CDEM testing at sufficient locations and intervals to determine if any area of the mine needs re-dusting. The rule should consider requirements for certification, recordkeeping (including a map of sample locations), and corrective actions similar to examination standards.

30 CFR 75.403-1 – The Assistant Secretary should consider amending the Emergency Temporary Standard for 30 CFR 75.403 (Maintenance of incombustible content of rock dust) to exclude surface moisture from the definition of total incombustible content.

30 CFR 75.512 – The Assistant Secretary should consider rulemaking to require that the record of electrical equipment (examinations, testing and maintenance) shall be countersigned by the mine foreman or equivalent mine official.

30 CFR 75.512-2 – The Assistant Secretary should consider rulemaking to revise the regulation so that the examinations and tests required by 30 75.512 shall be made at least every 7 days rather than weekly to prevent the potential for as many as 12 days between examinations.

75.1714-7 (a) – The Assistant Secretary should consider rulemaking to require methane detectors to be in the on position whenever a person with the detector is underground.

Appendix D – Enforcement of Specific Standards (Non-contributory Violations)

Enforcement of 30 CFR Part 50

Notification, Investigation, Reports and Records of Accidents, Injuries, Illnesses, Employment, and Coal Production in Mines

Requirements: Mandatory safety standard 30 CFR 50.10 required the mine operator to contact MSHA within 15 minutes once the operator knows or should know that an accident has occurred. Mandatory safety standard 30 CFR 50.2 defined 12 categories of accidents. Included in the definitions of an accident was an "unplanned inundation of a mine by a liquid or gas."

MSHA regulation 30 CFR 50.11(b) required each operator of a mine to investigate each accident and each occupational injury at the mine. The Regulation also required the operator to develop a report of each investigation.

MSHA regulations 30 CFR 50.20(a) and 30 CFR 50.20-1 required each mine operator to report to MSHA each accident, occupational injury, or occupational illness at a mine on MSHA Form 7000-1 (*Mine Accident, Injury, and Illness Report*) within 10 working days after the incident occurred.

MSHA regulation 30 CFR 50.30(a) required each mine operator to report employment to MSHA on MSHA Form 7000-2 (*Quarterly Mine Employment and Coal Production Report*) within 15 days after the end of each calendar quarter. MSHA Regulation 30 CFR 50.30(b) required each coal mine operator to report coal production to MSHA on MSHA Form 7000-2 within 15 days after the end of each calendar quarter.

MSHA regulation 30 CFR 50.40(a) required each operator of a mine to maintain a copy of each investigation report required to be prepared under 30 CFR 50.11 at the mine office closest to the mine for five years after the concurrence.

MSHA regulation 30 CFR 50.41 required each mine operator to allow MSHA to inspect and copy information related to any accident, injury, or illness which MSHA considers relevant and necessary to verify a report of investigation required by 30 CFR 50.11 or relevant and necessary to a determination of compliance with the reporting requirements of 30 CFR Part 50.

MSHA Policy and Procedures: Volume III of the MSHA *Program Policy Manual* stated: "An evaluation of operator compliance with reporting requirements under Part 50 shall be made at every regular inspection." The Manual also provided that a Part 50 reporting audit is to be conducted at a mine where a fatal accident has occurred, unless an audit had been conducted within a year prior to the fatal accident. The Manual also stated:

> Inspection personnel should carefully review the degree of negligence associated with all Part 50 citations. Any violation of Part 50 considered to be the result of a high degree of negligence or other unique aggravating circumstances may be referred for special assessment.
>
> Where circumstances indicate that there has been flagrant conduct surrounding a failure to report, such as attempting to conceal the fact that an injury occurred, serious consideration should be given to a reckless disregard negligence evaluation. The facts involved in such a violation should be carefully documented and transmitted to the appropriate District Manager for use in determining whether a recommendation for special assessment is appropriate.

The *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook directed inspectors to review required records and postings, including Mine Accident, Injury, and Illness Reports (MSHA Form 7000-1) and Quarterly Employment and Coal Production Reports (MSHA Form 7000-2) during each regular inspection.

Statement of Facts: District 4 inspectors documented checking MSHA 7000-1 Forms required by 30 CFR 50.20(a) during four of the six regular inspections and MSHA 7000-2 Forms required by 30 CFR 50.30(a) during five of the six regular inspections at UBB. A District 4 inspector issued three section 104(a) citations for violations of 30 CFR 50.20(a) during the third regular inspection for fiscal 2009. The three violations were for the Operator's failure to submit MSHA Form 7000-1 to report return to duty information for three injured miners. No violations of 30 CFR Part 50 were cited during the other five regular inspections.

District 4 personnel did not conduct a Part 50 Audit at UBB during the review period, nor were they required to do so. The previous Part 50 Audit at the Mine was conducted following a fatal electrical accident in July 2003.

District 4 personnel conducted 15 Part 50 Audits at other mines during the review period. A description of these audits follows.

- Seven audits were conducted to confirm eligibility for Sentinels of Safety awards. No violations were cited as a result of these audits.
- Five audits were conducted as a result of fatal accidents as directed by MSHA policy. During these audits, District 4 personnel issued a total of 79 citations for violations of 30 CFR Part 50. Penalties for these violations were calculated using the regular assessment provisions of Part 100.
- Three additional audits were conducted during the review period. District 4 personnel cited four violations of 30 CFR Part 50 as a result of these audits. Penalties for these violations were calculated using the regular assessment provisions of Part 100.

Including the violations cited as a result of the Part 50 audits, District 4 personnel cited 354 violations of 30 CFR Part 50 during the review period. This accounted for 36% of the total number of Part 50 violations cited at all coal mines nationwide. Four of the 28 violations (14%) designated as high negligence or reckless disregard were recommended for special assessment. Approximately 90% of the other Part 50 violations were assessed a civil penalty of $200 or less. Nationwide, approximately 26% of Part 50 violations designated as high negligence or reckless disregard were recommended for special assessment.

Following the explosion, District 4 conducted a Part 50 Audit at UBB between June 7 and September 7, 2010. The audit period covered calendar years 2008, 2009, and the first quarter of 2010. District 4 issued 39 section 104(a) citations for violations found during the audit as follows.

- Eighteen citations were issued for failure to report injuries on MSHA 7000-1 Forms.
- Three citations were issued for failure to report illnesses on MSHA 7000-1 Forms.
- Ten citations were issued for providing inaccurate information on MSHA 7000-1 or 7000-2 Forms.
- Five citations were issued for not reporting non-injury roof falls on MSHA 7000-1 Forms. While the roof falls were orally reported to MSHA, the Operator did not submit the required MSHA 7000-1 Forms.
- Three citations were issued for not filing MSHA 7000-1 Forms within the required 10-day timeframe.

In addition to the Part 50 audit violations, two Part 50 violations were cited by District 4 at UBB after the explosion, one in May and one in June 2010. The two violations were for the Operator's failure to complete Section D of the MSHA 7000-1 Form when injured miners returned to work.

During interviews, District 4 managers stated it was District practice to conduct Part 50 audits following fatal accidents, which was consistent with MSHA policy. A comprehensive Part 50 audit is labor intensive, as demonstrated by the audit at UBB following the explosion that required 125 hours to complete.

The amended Non-Fatal Days Lost (NFDL) injury incidence rates for 2008 and 2009 were 89% and 76%, respectively, higher than originally reported after including the unreported injuries and correcting the reported worker hours. (See the "Overview of Upper Big Branch Mine-South.")

The Accident Investigation team issued 13 additional non-contributory citations and orders for Part 50 violations. The team issued five section 104(a) citations for not reporting four injuries and one illness; five section 104(d)(2) orders for failing to immediately notify MSHA of three roof falls, one water inundation, and one methane ignition; one section 104(d)(2) order for failing to notify MSHA of the April 5 explosion within 15 minutes; one section 104(a) citation for failing to preserve evidence of a roof fall; and one section 104(a) citation for not providing copies of accident investigation reports.

Three of these violations were related to conditions that directly affected the 1 North Longwall. The following is a description of the violations.

- Based on testimony taken after the explosion, the Accident Investigation team concluded that a methane ignition had occurred mid-face of the Longwall in November 2009. The Operator failed to immediately report this ignition to MSHA and did not submit an MSHA 7000-1 Form.
- The MSHA Accident Investigation team concluded from inspector notes and witness testimony that a water inundation of the 1 North Longwall panel occurred on November 16, 2009. The inundation caused the Bandytown Fan pressure to increase from the normal pressure of -4.5 inches of water gauge on November 16 to -17.0 inches of water gauge on November 18. MSHA was not immediately notified of this inundation, and a MSHA 7000-1 Form was not submitted.
- The Accident Investigation team determined that a roof fall occurred on December 4, 2009, that extended from No. 1 shield outby to the stage loader in the No. 1 entry on the headgate side of the 1 North Longwall Section. The roof fall occurrence was discovered during the team's review of the Operator's production reports. This roof fall was not immediately reported to MSHA. The MSHA Form 7000-1 that was filed with MSHA indicated the roof fall occurred on December 5, 2009.

MSHA's Headquarters conducted Part 50 Audits in conjunction with PPOV reviews at two additional Massey Energy mines after the UBB explosion. The audit at the Inman Energy, Randolph Mine commenced on October 12, 2010, and was completed on August 17, 2011. The audit at Independence Coal Company, Inc., Justice #1 mine commenced on November 10, 2010, and was completed on August 17, 2011. The audit periods were from July 1, 2009, through June 30, 2010.

The Randolph and Justice #1 mine audits were delayed due to the operators' initial refusal to permit an Authorized Representative to inspect and copy information to determine compliance with the reporting requirements related to accidents, injuries, and illnesses that occurred at the mines or may have resulted from work at the mines. These operators were cited for violations of 30 CFR 50.41. After an Administrative Law Judge decision in MSHA's favor, Alpha Natural Resources, which had acquired Massey, provided the requested documents needed to complete the audits.

The audits revealed that the operators did not file MSHA 7000-1 forms for a number of reportable occupational injuries. Mistakes on forms that were filed included: entering incorrect information concerning injuries and illnesses, incorrect number of days of restricted duty, and incorrect number of days lost. Errors on the 7000-2 forms included over- and under-reporting of employee hours in some quarters, under-reporting of injuries, over-reporting of average number of employees, and late filing of the forms. The operators' investigation reports of accidents did not contain certain required information such as: the date of investigation, name of persons participating in the investigation, steps taken to prevent a future occurrence, or the name, occupation, and experience of the injured miner. In some cases, the operators failed to conduct investigations of occupational injuries. In other cases when investigations were conducted, the operators failed to maintain copies of their investigative reports.

During these audits, MSHA issued 77 section 104(a) citations because the operators failed to report, or inaccurately reported, a total of 24 injuries that resulted in 1,125 lost days of work. As a result of these audits, both mines received notices of a potential pattern of violations.

Conclusion: Accurate reporting of accidents, injuries, illnesses, worker hours, and coal production is critical to MSHA's ability to direct additional attention to mines with health and safety problems. Part 50 Audits conducted at UBB and two other Massey-controlled mines after the UBB explosion demonstrate the operators' repeated failure to report accidents, injuries, illnesses, and worker hours accurately on MSHA Forms 7000-1 and 7000-2, allowing these three operators to significantly under-represent injury rates at their mines. When accidents and injuries were reported by the operators, the forms frequently included inaccurate information. In some cases, they were not submitted within the required 10-day time frame.

District 4 personnel complied with MSHA policy for conducting Part 50 Audits following fatal accidents. They also conducted three additional audits during the review period beyond the requirements of Agency policy.

District 4 personnel cited more Part 50 violations during the review period than any other Coal district, accounting for 36% of the total number of Part 50 violations cited at all coal mines nationwide. They recommended special assessments for a lower percentage of Part 50 violations designated as high negligence or reckless disregard compared to the other Coal districts. The regularly assessed civil penalties for the remaining Part 50 violations were not sufficient to provide incentive for compliance.

Increased penalties for Part 50 violations and more frequent Part 50 Audits would likely improve operator compliance with Part 50 reporting requirements.

District 4 inspectors did not follow MSHA procedures for reviewing Part 50 records during two of the six regular inspections conducted at UBB during the review period. However, the routine review of Part 50 records conducted during regular inspections would not have identified many of the issues revealed during more comprehensive Part 50 audits.

Corrective Actions Taken: The Assistant Secretary directed that Part 50 Audits be conducted as part of the potential pattern of violations review process. Beginning in October 2010, MSHA began conducting audits at mines that met all the potential pattern of violations screening criteria, with the exception of the injury severity measure. Numerous Part 50 violations were cited, including failures to report injuries and under-reporting the lost time associated with reported injuries. As a result, four additional mines were placed in potential pattern of violations status.

In October 2010, the Department of Labor entered into a contract with Eastern Research Group, Inc. to conduct an evaluation of the accuracy and completeness of Part 50 reporting of non-fatal injuries and illnesses in the mining industry.

Recommendations: The Administrator for Coal should direct the District 4 and 12 Managers to: reinstruct inspectors in the *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook directive to check and document checking Part 50 records during every regular inspection. The District Managers should hold inspection supervisors accountable for enforcing compliance with this directive.

The Assistant Secretary should consider rulemaking to modify the provisions of 30 CFR Part 100 to provide for increased penalties for the failure of mine operators to report accidents, injuries, and illnesses.

The Assistant Secretary should instruct the Director of EPD to provide resources to assist Coal Mine Safety and Health by conducting additional Part 50 Audits. The Assistant Secretary should consider making some EFS specialists authorized representatives to enable them to conduct audits independently of Coal inspectors.

The Assistant Secretary should request that NIOSH develop a method to identify operators or mines for Part 50 Audits. Potential criteria could include compliance record of operators, hazardous condition complaints, respirable dust issues, and allegations of under-reporting.

Enforcement of 30 CFR 75.333

Ventilation controls

Requirements: Mandatory safety standard 30 CFR 75.333(d) stated in pertinent part that doors used in lieu of permanent stoppings or to control ventilation within an air course shall be: "[o]f sufficient strength to serve their intended purpose of maintaining separation and permitting travel between or within air courses or entries" per subparagraph (d)(2); and "[i]nstalled 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" per subparagraph (d)(3).

Mandatory safety standard 30 CFR 75.333(h) stated: "All ventilation controls, including seals, shall be maintained to serve the purpose for which they were built."

MSHA Policies and Procedures: None

Statement of Facts: Performance Coal Company used equipment doors in lieu of stoppings at many locations in UBB, primarily to allow movement of mobile equipment between air courses without disrupting ventilation. Equipment doors must be installed in pairs to form an airlock, so that when one is opened the second remains closed, to prevent a short circuit or disruption of airflow in the mine. The mine ventilation map showed that more than 50 sets of equipment doors were installed to allow travel between isolated air courses. In addition, the MSHA Accident Investigation team determined that there were equipment doors installed in the Mine that were not indicated on the mine ventilation map.

During the review period, District 4 inspectors cited 53 violations of 30 CFR 75.333 and its subparagraphs at UBB. Eight violations involved equipment doors: four for improper installation; two for failing to maintain doors; and two for failing to close doors as required.

The Accident Investigation team cited two non-contributory violations regarding equipment doors. One section 104(a) citation (No. 8258565) cited three locations where equipment doors were not installed in pairs to form an air lock as required by 30 CFR 75.333(d)(3). Another section 104(a) citation (No. 4900429) cited the Operator under 30 CFR 75.333(d) for installing equipment doors in lieu of overcasts.

An overcast allows two air courses to cross paths without mixing. A key element of a successful overcast installation requires removing a sufficient amount of roof material over the top of the overcast to maintain the same area as the entry. If the area is not maintained, the overcast restricts airflow, increases pressure loss in the air split, and reduces overall ventilation capacity. Overcasts constructed in a number of locations in outby areas of the Mine were found to have top clearances of less than three feet. These were found in areas of the Mine unaffected by the explosion where the mining height was in excess of six feet.

In some locations, the Operator installed two pairs of equipment doors to allow the track haulage road to pass through another air course, rather than building overcasts to permit uninterrupted travel. Airlock doors do not provide the same function as overcasts, but can be used to reduce the number of overcasts needed to isolate air courses. Although installing airlock doors in this manner complies with 30 CFR Part 75, miners may be tempted to leave both doors open for convenience, particularly when multiple vehicles pass through them, such as during shift change. Keeping both doors open, even for short durations, does not comply with 30 CFR 75.333.

Figure 19 shows one such installation in the main track haulage road of the North Glory Mains. At the time of the explosion, miners accessed the 1 North Longwall and two development sections (Headgate #22 and Tailgate #22) using this roadway. Coal was transported in the adjacent belt conveyor entry. The two entries containing the track and belt conveyor were ventilated by a common air split along much of their length. However, where a separate intake air course crossed the belt conveyor air course, the Operator installed two sets of equipment doors. Miners drove track equipment through one set of doors, into the separate intake air split, then through a second set of doors, back into the air course containing the belt conveyor system. The belt conveyor air course was reduced from two entries to one where it crossed a set of overcasts that permitted the two air splits to cross without mixing. These air courses could not mix at this location since they isolated primary and alternate escapeways and the intake split (shown in gray) that ventilated the working sections.

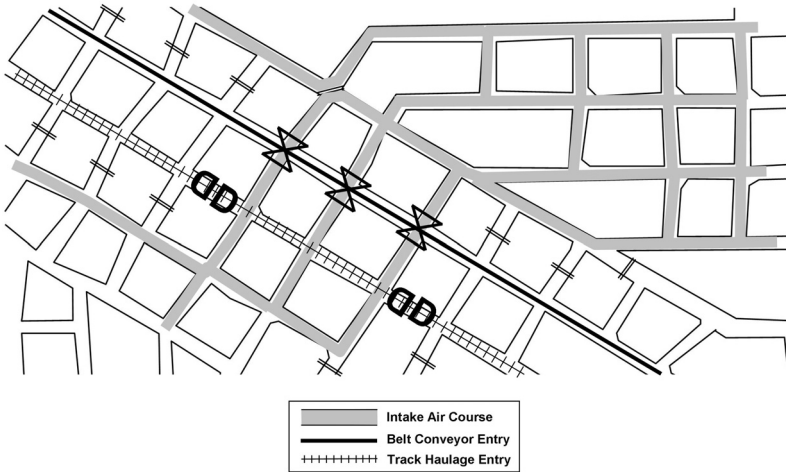


Figure 19 - Depiction of actual installation of equipment doors in the North Glory Mains

Figure 20 shows how the separation of the two air courses could have been maintained using two sets of overcasts and no equipment doors. This method would have provided access to the track haulage entry without the need to open and close doors. Overcasts would have maintained separation of these air courses with less risk to the ventilation system because equipment doors are more prone to damage and excessive leakage. Therefore, the method illustrated in Figure 20 has historically been the preferred industry practice in areas of high traffic, such as in main haulage roads.

Another advantage to the use of overcasts is that the common air split is maintained in two entries rather than one in the area of the air lock, which reduces ventilating pressure losses when overcasts are properly installed. Vehicular access between air courses still can be accomplished by installing equipment doors to replace stoppings in crosscuts between the air courses.

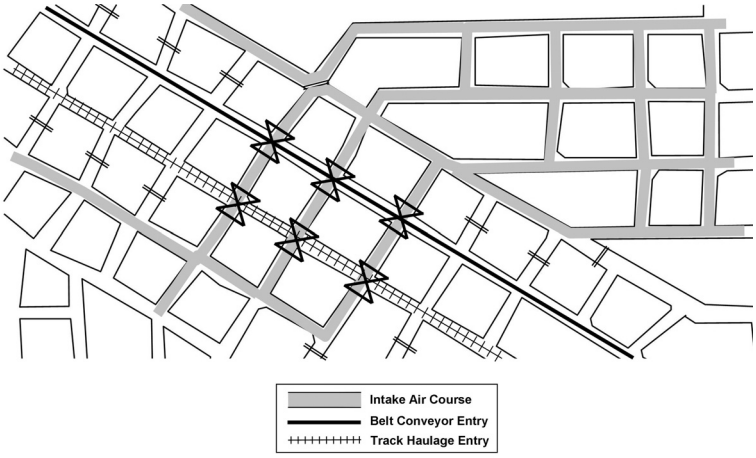


Figure 20 - Six Overcast Alternative to Eliminate Equipment Doors

Systematic manual opening and closing of equipment doors adds time to travel and requires miners to leave the mantrip or mobile equipment to open and close the doors. The MSHA Accident Investigation team heard testimony from UBB miners that equipment doors were often left open to facilitate travel for multiple units of mobile equipment, rather than opening and closing doors systematically to maintain separation of air courses. Leaving equipment doors open short-circuits intake air, which can adversely affect methane and respirable dust control in other areas of the mine. Interlock systems are available for installation on airlock doors which ensure only one door can be opened at a time.

To form an effective airlock, the space between the doors must be able to accommodate the equipment passing through the airlock when both doors are completely closed. When closed, the door and door frame must form a tight seal to minimize leakage. Equipment doors inherently leak more than stoppings.

Gaps beneath doors, usually due to the irregularities of the mine floor, are particularly problematic.

District 4 personnel indicated during interviews that safety standards did not prohibit the use of equipment doors in this manner. However, 30 CFR 75.333(d)(1) does not provide guidance to operators or inspectors regarding the evaluation of equipment door installations, and MSHA policy has never been developed to address enforcement of this standard.

The MSHA Accident Investigation team found that open equipment doors at key locations would not have caused a dramatic decrease in the intake air quantity for the 1 North Longwall. However, some reductions on the Headgate #22 and Tailgate #22 development sections were possible when equipment doors installed on the longwall intake were opened. The Accident Investigation team also found that return air from the development sections could be routed to the longwall face when equipment doors between the No. 3 entry of the longwall headgate and the No. 1 entry of Tailgate #22 were left open (see Figure 21). The Accident Investigation team determined through interviews with miners that there was at least one occasion when this occurred.

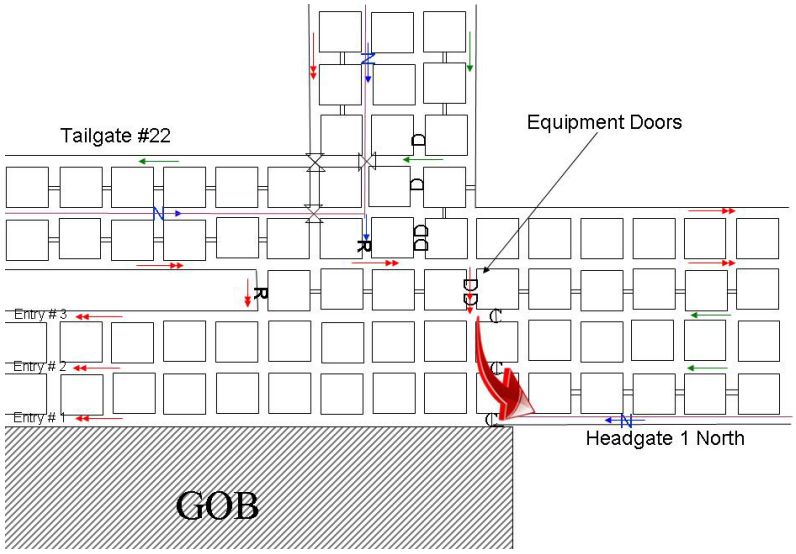


Figure 21 - Latest Headgate Ventilation Design

Conclusion: Mine design and plans incorporating equipment doors in critical areas often create a ventilation system too fragile to maintain an acceptable degree of safety for miners. Currently, regulations address the use of equipment doors to separate air courses in lieu of stoppings. However, the proper installation, operation, and maintenance of equipment doors are critical for maintaining a safe and effectively ventilated mine.

The use of equipment doors in critical locations to isolate air courses is a poor mining practice. Equipment doors are more likely to fail and less likely to ensure separation than overcasts. For long-term installations, the use of overcasts is a more reliable mining practice. In many instances, Performance Coal Company used equipment doors to avoid constructing overcasts. Even when the Operator constructed overcasts, many were not installed properly.

Enforcement of 30 CFR 75.351 and 75.352

Atmospheric monitoring systems (AMS) and Actions in response to AMS signals

Requirements: Because the Operator was using air from the belt entry to ventilate the longwall section, most of the applicable standards were contained in 30 CFR Subpart D (Ventilation). Additional requirements for carbon monoxide (CO) fire detection systems were contained in 30 CFR Subpart L (Fire Protection).

MSHA Policies and Procedures: MSHA guidance on the inspection of AMS and CO monitoring systems was provided in the *Carbon Monoxide and Atmospheric Monitoring Systems Inspection Procedures* Handbook (PH-08-V-2). The Handbook was being revised at the time of the explosion to address changes in regulations regarding the use of air from the belt entry to ventilate working sections and fire detection systems in belt entries of underground coal mines required by 30 CFR 75.1103.

The *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook directed inspectors to conduct the following activity during each regular inspection:

> AMS Alarm Systems (AMS). The inspector shall examine AMS system components and observe the operator making a required calibration of system sensors. Data and times obtained during the inspection shall be compared with information recorded by the system on the surface. Additionally, an evaluation shall be made concerning the responsible person(s) about the AMS system display, the actions required for any alert and alarm, and appropriate notification of miners and mine management when an alert or alarm occurs. The most recent AMS records shall also be reviewed to determine if proper notifications and corrective actions have been taken to address previous alerts, alarms, or system failures.
>
> *Documentation Required: Compliance with this procedure shall be recorded in the inspection hard-copy notes to include the AMS manufacturer and model…..* [Emphasis on original]

The *Carbon Monoxide and Atmospheric Monitoring Systems Inspection Procedures Handbook* (CO Handbook) provided procedures for inspecting AMS and CO monitoring systems. In pertinent part, the Handbook stated: "Observe a function test on 10% of the total sensors but not less than 5 sensors by applying a known concentration of CO. Record the reading of the sensor and compare it with the known concentration." The *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook did not specifically reference the CO Handbook for use during each regular inspection.

Statement of Facts: The Accident Investigation team identified nine separate non-contributory violations of mandatory safety standards related to the installation, operation, examination, and maintenance of the AMS and CO systems at UBB. Conditions and practices cited included the following:

- CO sensor spacing was not maintained at 1,000-foot intervals
- The CO sensor map was not up-to-date
- AMS operators did not take the correct actions when alarm signals were received on the surface
- AMS operators did not always record actions taken to correct system malfunctions or failures
- Time periods between CO sensor calibrations exceeded 31 days
- Records of calibrations were not properly maintained
- Not all of the AMS operators at the Mine were trained adequately
- Some CO sensors were not positioned at the correct height within the belt entry

The Accident Investigation team determined that at least 64 CO sensors were installed at UBB at the time of the explosion. In September 2009, the ventilation plan map indicated approximately 54 sensors were in use in the belt entries. A review of the inspection notes indicated that some inspectors documented checking sensors, but there was no indication that inspectors checked either 5 or 6 sensor calibrations during three of the six regular inspections conducted during the review period. Notes indicated that inspectors observed the Operator calibrating a sensor during only one regular inspection in the review period.

On September 23, 2009, the Operator was cited for failing to maintain the system in proper operating condition. The #72 sensor located at the longwall mule train was found to be out of calibration when a known gas of 25 ppm was applied to the sensor. The inspection notes for this shift indicated three sensors were checked, which included the application of calibration gas to the sensors. On the same inspection, the inspector cited the Operator for not maintaining the longwall belt tail alarm unit in proper operating

condition when he found it would not automatically provide a visual and audible alarm. A similar condition was cited as a contributory violation in the Aracoma accident investigation. In addition, three violations on the surface, including AMS records, were cited by this inspector.

Some inspectors stated in interviews that they left the inspection of AMS and CO fire detection systems to electrical specialists. During the second regular inspection for fiscal 2010, an inspector recorded in his notes that he checked CO sensors installed on four belt conveyors, which encompassed an area where more than five sensors were installed. However, the inspector did not identify in his notes the specific locations of these sensors or what was checked.

The *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook directed that the adequacy of AMS operator training was to be determined by inspectors asking the AMS operators a series of questions to determine if the responses and recordkeeping requirements are being fulfilled. Most inspectors indicated they knew AMS operators were to be interviewed as part of this determination; however, some inspection notes did not indicate that these interviews were being completed as directed.

While the AMS at Aracoma responded properly to the fire, the accident investigation identified the failure to provide AMS operator training as a contributory violation. The Aracoma mine was operated by another subsidiary of Massey and inspected by District 4 enforcement personnel. Several deficiencies in the installation, operation, and maintenance of the system also were identified at UBB by the accident investigation team. These included inadequate recordkeeping, improper sensor locations, and calibration of sensors at intervals exceeding 31 days.

Records indicated there were no violations for inadequate training of AMS operators at UBB during the review period. However, on September 21, 2009, a District 4 inspector did cite the operator of a different mine for failing to maintain a record of the training of the AMS operator on one occasion.

Entry-level inspector training and journeyman inspector retraining provided at the National Mine Health and Safety Academy each included a comprehensive session on the inspection of AMS and CO fire detection systems. Content of these training sessions was modified regularly to address regulatory and policy changes. However, interviews indicated that District 4 inspectors were not consistently well versed in relevant inspection procedures. Furthermore, District 4 journeyman inspectors had not received training on AMS and CO system inspections since their entry-level inspector training.

Conclusion: The guidance provided in the *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook did not reference or direct inspectors to use the CO Handbook when inspecting AMS and CO fire detection systems. While many inspectors were aware of most AMS regulations, some inspectors relied on electrical specialists to conduct inspections of these systems. While some of the inspection procedures in the CO Handbook would be more appropriate for electrical specialists to conduct, there are many salient portions of the inspection that a regular inspector can complete.

Some inspectors were not adequately trained to enforce the installation and maintenance requirements of 30 CFR 75.351, or the recordkeeping requirements of 30 CFR 75.352. This contributed to the failure to identify deficiencies in the Operator's installation of the CO sensors in the belt entries at UBB and in the records maintained by the Operator.

Recommendations: The Administrator for Coal should direct the committee revising the *Carbon Monoxide and Atmospheric Monitoring Systems Inspection Procedures* Handbook to identify the salient parts of an AMS or CO system inspection. The CO Handbook should describe how an inspector would conduct an inspection to address each salient part to determine the system is being operated and maintained in compliance with the appropriate safety standards. Any portions of the system inspection that require an electrical specialist attention should be clearly identified.

The Administrator for Coal should direct the revision of the *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook to specify those procedures outlined in the CO Handbook that are to be completed during each regular inspection.

Enforcement of Electrical Safety Standards

MSHA Policies and Procedures: In pertinent part, the *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook directed inspectors to conduct the following activities during each regular inspection:

> Outby Electrical Equipment. An inspection shall be conducted of each piece of in-use or available-for-use permanent electrical equipment as listed in the operator examination records or observed in-use by the inspector to determine compliance with applicable standards. Portable electrical equipment should be inspected as encountered. A regular inspector shall not attempt to perform inspections or tests that require the expertise of an electrical specialist.
>
> Section Equipment. Each piece of in-service section equipment shall be inspected to determine compliance with applicable standards.

In pertinent part, The *Coal Electrical Inspection Procedures* Handbook, PH93-V-7, May 1993, stated the following:

> Many of the requirements of 30 CFR 75.500 through 75.1003 and 30 CFR 77.500 through 77.906 are very technical in nature and a thorough knowledge of electrical theory, mine power systems, and electric equipment is essential if inspection personnel are to properly implement these requirements without creating hazards to themselves or to miners. When coal mine inspectors encounter electrical problems involving high-voltage protection, grounding conductors, or other problems that require special electrical expertise, the assistance of an electrical engineer or coal mine inspector (electrical) should be requested.
>
> During each electrical inspection, the electrical inspector or engineer (electrical specialist) shall inspect an adequate portion of the electric circuits, electric equipment, and mechanical equipment at each mine to ascertain that the equipment and circuits are being maintained in accordance with the Mine Act. If the electrical specialist determines that the maintenance program at the mine is not adequate to maintain compliance with the Mine Act, the inspector shall make a complete electrical inspection of the mine. During each electrical inspection, every effort shall be made to insure that management has established an examination and maintenance program (30 CFR 75.512 and 30 CFR 77.502) for electric equipment that will insure compliance with the requirements of the Mine Act so that the equipment and circuits will not be installed in an unsafe manner or be allowed to deteriorate into an unsafe condition.

Statement of Facts: A review of training records for District 4 inspectors revealed that regular inspectors received training to conduct general inspections of electric equipment at the National Mine Health and Safety Academy. Interviews with District 4 inspectors demonstrated they possessed the skills and knowledge to conduct basic inspections of electric equipment. Electrical specialists received the same general training, but also received additional specialized electrical training and biannual electrical retraining at the Academy.

The Internal Review team found that prior to the explosion, District 4 inspectors conducted inspections of electric equipment that normally did not require special electrical expertise. During the review period, District 4 inspectors cited 684 violations at UBB. Seventy-eight (11%) were violations of electrical standards.

After the explosion, the Accident Investigation team, which included electrical engineers and specialists from outside District 4, conducted an inspection of electric equipment and circuits within the explosion area. The team cited 199 violations of electrical standards, of which 49 were cited as section 104(d)(2) orders and 103 were evaluated as S&S.

The Internal Review team examined inspector notes and the Inspection Tracking System to identify the electric equipment that District 4 personnel inspected during the month before the explosion. An analysis

then was conducted to determine which violations cited by the Accident Investigation electrical team were not identified by District 4 inspectors.

The Accident Investigation team dedicated significant resources examining electric systems and equipment. In contrast, inspectors did not have equivalent time to inspect electric systems and equipment during regular inspections. In addition, some violations cited by the Accident Investigation team could have occurred following the District 4 inspections. To minimize the possibility of changing equipment conditions, the analysis was limited to March 2010. This limited timeframe increased the likelihood that the violations cited by the Accident Investigation electrical team should have been identified during District 4 inspections. The analysis revealed that the Accident Investigation electrical team cited 63 violations on equipment inspected by District 4 inspectors during March 2010.

The 63 violations cited by Accident Investigation electrical team identified 225 total safety defects. Training records indicate that District 4 regular inspectors had received the training necessary to identify 149 (66%) of these safety defects. Identification of the remaining defects would have required specialized knowledge and training and would probably be identified only by an electrical specialist or engineer. District 4 inspectors cited eight electrical violations on the same equipment in the month before the explosion.

Interviews revealed that during the review period, inspectors did not request the assistance of an electrical specialist at UBB. Electrical specialists stated that complete electrical inspections had not been performed in District 4 for several years.

The last inspections by an electrical specialist at UBB were performed in October 2009. The specialist examined CO sensors on the North Belts on October 6, and electrical records, handheld methane detectors, and electric equipment on 4 Section on October 8. No enforcement actions were taken.

In April 2010, the District 4 Electrical Department was staffed by a supervisor, four specialists, and one office assistant. The department operated as follows.

- One specialist reviewed shaft & slope construction plans and conducted the required monthly inspections of these sites.
- One specialist reviewed Field Modifications and conducted hoist & elevator inspections.
- Two specialists were assigned full-time to review Emergency Response Plans (ERPs), which address, in part, communication and tracking systems and refuge alternatives. These plan reviews were assigned to the Electrical Department by the District Manager. The ERPs also included 30 CFR 75.1502 and SCSR plans.

In addition, the Electrical Department supervisor stated during his interview that due to the large number of plan reviews his department had to complete, electrical specialists were only spending an estimated 10% of their time on actual electrical inspections.

While not a requirement pursuant to MSHA policy, some district offices assign electrical specialists to inspect new substation installations for safety and compliance when resources permit. The District 4 Electrical Department supervisor also stated that for several years prior to the explosion the Electrical Department had not conducted any new high-voltage substation inspections. He estimated that as many as 25 new substations were put on-line in District 4 without being inspected by electrical specialists. When asked if issues were found during recent substation inspections that needed to be corrected, he stated: "It's rare that you go to one and check it that there's not an issue that needs to be corrected."

The Electrical Department supervisor stated that District 4 did not have adequate resources in the Electrical Department to conduct complete electrical inspections. He also stated that electrical specialists had been selected from within four field offices in the District. However, they had not completed any electrical inspection duties due to mandated regular inspection assignments. The District Manager indicated during his interview that inspection assignments and the hiring of personnel focused on completing mandatory inspections.

Conclusions: The Operator's disregard for numerous electrical safety standards at UBB frequently endangered the safety of its miners. Equipment not being maintained in permissible condition can lead to death or serious injury.

While there was no evidence that District 4 inspectors failed to cite electrical violations that they identified, it is clear that electrical standards were not effectively enforced at UBB. The Accident Investigation team found a significant number of violations that were not identified by District 4 inspectors in the month before the explosion. Some of the violations may have occurred after the last regular inspection, some required specialized electrical training to identify, and others likely existed and should have been recognized during the regular inspections.

The number of electrical specialists in District 4 was not adequate to handle the workload, and the number of specialists available to the Mt. Hope Field Office was insufficient to handle the demands created by the Operator's persistent failure to comply with electrical standards. Electrical specialists are trained and qualified to identify hazards in complex electrical systems. However, during the review period, some electrical specialists were assigned to conduct regular inspections, further diminishing the resources available for conducting comprehensive electrical inspections. Without sufficient and properly allocated resources to conduct specialized electrical inspections, miners potentially will continue to be exposed to electrical hazards.

30 CFR 75.503 - Permissible electric face equipment; maintenance

Requirements: Mandatory safety standard 30 CFR 75.503 stated: "The operator of each coal mine shall maintain in permissible condition all electric face equipment required by §§ 75.500, 75.501, and 75.504 to be permissible which is taken into or used inby the last open crosscut of any such mine."

Statement of Facts: District 4 inspectors conducted permissibility inspections of electric face equipment during each regular inspection. A total of 18 violations of 30 CFR 75.503 were cited during the six inspections. Four of the 18 violations were evaluated as S&S, and all were issued as section 104(a) citations. An electrical specialist did not participate in the last regular inspection at UBB before the explosion.

After the explosion, the Accident Investigation team identified and cited the Operator for 31 violations of 30 CFR 75.503 in the explosion area, including 18 section 104(d)(2) orders. Nineteen of these non-contributory violations were cited on electric machinery or equipment that District 4 inspectors examined during the regular inspection ongoing in March 2010. Seven of these 19 were cited as section 104(d)(2) orders; eight were evaluated as S&S. There were 131 individual safety defects identified in these violations. Some of these cited safety defects may have existed during the last complete regular inspection, while others may have occurred after the last inspection. In the following examples, safety defects that may have existed during the inspection of the cited equipment and, if so, should have been recognized by an inspector are indicated by an asterisk (*).

The Accident Investigation team issued a section 104(d)(2) order (No. 4900584) because the continuous mining machine "located on the HG 22 section was not being maintained in approved condition." The following conditions were listed:

1. The X/P [explosion-proof] enclosure for the fire suppression is not securely attached to the machine.*
2. The X/P enclosure for the methane monitor power supply is not securely attached to the machine.*
3. The trailing cable junction box (X/P enclosure) has plugs in two of the unused entrances that are not spot-welded.*
4. The off-side cutter motor junction box (X/P enclosure) is not securely attached to the machine.
5. The master control station (X/P enclosure) has the interlock switch taped in the closed position (this switch is designed to de-energize all components inside the enclosure in event someone removes the cover while the machine is energized-SAFETY SWITCH DEFEATED).

6. The lid switch on the methane monitor power supply is broken.*
7. Two packing nuts on the entrance glands in the trailing cable junction box are not secured from loosening.*
8. The left rear MCI area light has a packing gland damaged to the degree that conductors may be damaged.*
9. The guard is missing over the rear area light.*
10. The left rear area light has a plug in an unused entrance that is not spot -welded, and*
11. The off-side cutter motor junction box has two packing glands that are not secured from loosening.*
12. The methane monitor sensor did not have a set screw at the cable entrance gland.
13. The XP enclosure for the methane sensor has a lock washer missing from one of the bolts in the lid.*

The Accident Investigation team issued a section 104(d)(2) order (No. 8405506) for a shield hauler that was not being maintained in permissible condition. The following conditions were listed:

1. The breaker panel box lid has 2 bolts missing.*
2. The main and breaker control panel do not have the same length bolts.
3. The battery end off-side headlight has 2 lock washers missing from the lid and the other side light has a bolt missing.*
4. One of the flat washers is missing from the deck mounted control station panel lid.*
5. The battery lead cables are too long, one is 43 inches and the other is 52 inches long.*
6. The battery leads have a welding plug spliced into the leads and there is a splice in the lead that is not adequately insulated.*
7. The deck mounted speed indicator has the wrong bolt in the cover. The bolt is not the correct bolt for the lenses.
8. There is a cut cable conduit and the cable is lying on the drive shaft. The conduit has been taped.*
9. The pump motor cable has been pulled from the gland.*
10. The gland nut for the master controller in the operator's deck is not secure.*
11. The battery does not have an approval tag.
12. The Stahl barrier relay does not have an IA number on the tag.

Conclusion: Many of the 131 safety defects identified by the Accident Investigation electrical team within the 19 violations discussed in this section were obvious, extensive, and of a nature that depicts Massey's disregard for the requirements of this standard. While there were a number of violations that inspectors should have seen if they existed at the time of the inspection, interviews with District 4 inspectors, inspection notes, and citations did not disclose any instances in which a permissibility violation was identified and not cited. Additionally, some permissibility violations were technical in nature and required the expertise of an electrical specialist to identify. Other violations may have occurred after inspectors examined the equipment involved.

District 4 regular inspectors did not uniformly display the level of technical skills required to conduct permissibility inspections of section electric machinery and equipment.

30 CFR 75.512 - Electrical Equipment; Examination, testing and maintenance

Requirements: Mandatory safety standard 30 CFR 75.512 required that "All electric equipment shall be frequently examined, tested, and properly maintained by a qualified person to assure safe operating conditions. When a potentially dangerous condition is found on electric equipment, such equipment shall be removed from service until such condition is corrected. A record of such examinations shall be kept and made available to an authorized representative of the Secretary and to the miners in such mine."

MSHA Policies and Procedures: The *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook directed inspectors to review all records of Weekly Examination of Underground Electric Equipment during each regular inspection. Before the inspection is completed, records shall be reviewed back in time to the ending date of the previous regular inspection.

The *Program Policy Manual* included the following policy for 30 CFR 75.512:

> The required examinations and tests must be thorough enough to insure that the electric equipment has not deteriorated through neglect, abuse or normal use into an unsafe condition that could result in a shock, fire, or other hazard to the miners.
>
> The record of examinations of electric equipment required by this Section shall list separately each individual piece of electric equipment in the mine.
>
> If the qualified person making the required examinations and test finds any potentially dangerous condition, that person shall immediately cause the defective equipment to be removed from service until such condition is corrected.
>
> If each individual piece of electric equipment is not listed separately and identified with a serial or company number and the location of each unit, and if all dangerous conditions and corrective actions are not recorded, the records of weekly examinations of electric equipment are incomplete and shall be considered to be in violation of this Section.

Statement of Facts: Of all of the non-contributory violations cited by the Accident Investigation team, the single-most cited safety standard was 30 CFR 75.512. Most of these violations were failures to conduct weekly examinations, to record examinations, and to remove equipment from service when unsafe conditions were found.

The 85 violations cited under this mandatory safety standard accounted for nearly one-fourth of the total number of non-contributory violations. In these enforcement actions, 24 section 104(d)(2) orders were issued to the Operator, including two determined to be flagrant. In addition, 61 section 104(a) citations were issued.

In one of the flagrant orders, the Accident Investigation team determined that the continuous mining machine located on Headgate #22 Section was not being maintained in a safe operating condition. The deficiencies identified included:

> (1) the cutter motor circuit breaker cannot be reset from outside the XP enclosure. The handle to reset the breaker has bolts missing in the mechanism. (2) inside the XP enclosure on the off-side of the machine containing the cutter motor circuit breaker, the 120 volt Rev relay is not mounted. It is being supported by the wiring for the relay. (3) the XP enclosure on the off-side of the machine where the cutter motor power conductors are connected is not securely mounted. The mounting bolts are broken and the XP enclosure is lying inside the compartment. (4) the conduit is missing from the cable to connect the antenna to the receiver (off machine component). (5) the 3/0 trailing cable is not properly bushed at the XP enclosure where the cable is attached to the machine. The individual conductors are all that are protruding through the packing gland. (6) The cable from the receiver to the antenna is not long enough to connect to the antenna. This is a remote controlled machine.

The Accident Investigation team also determined that the Operator failed to make an adequate weekly electrical examination of the continuous mining machine for the week prior to the explosion. The Accident Investigation team concluded the numerous citations issued for this machine should have been detected during the examination, and that some of the cited conditions had existed for a significant amount of time.

Conclusion: Many of the 30 CFR 75.512 violations cited were for the Operator's failure to conduct weekly electrical examinations in the week prior to the explosion. Some violations cited by the Accident Investigation team existed for months. Although, other violations may not have existed at the time equipment was last inspected some violations should have been observed and cited by District 4 inspectors prior to the explosion.

30 CFR 75.1002 - Installation of electric equipment and conductors; permissibility

Requirements: Mandatory safety standard 30 CFR 75.1002 requires that:

> (a) Electric equipment must be permissible and maintained in a permissible condition when such equipment is located within 150 feet of pillar workings or longwall faces.
>
> (b) Electric conductors and cables installed in or inby the last open crosscut or within 150 feet of pillar workings or longwall faces must be-
>
> (1) Shielded high-voltage cables supplying power to permissible longwall equipment;
> (2) Interconnecting conductors and cables of permissible longwall equipment;
> (3) Conductors and cables of intrinsically safe circuits; and
> (4) Cables and conductors supplying power to low- and medium-voltage permissible equipment.
> (5) Shielded high-voltage cables supplying power to permissible continuous mining machines.

Statement of Facts: Inspection reports for UBB disclosed that District 4 enforcement personnel conducted permissibility inspections of longwall electric face equipment during each regular inspection after the section started production in September 2009. There were no violations of 30 CFR 75.1002 cited at UBB by District 4 inspectors prior to the explosion.

The longwall was last inspected for permissibility on March 15, 2010. The inspector's Time and Activity Report for that date shows that he spent a total of four hours on the MMU and two hours in outby areas. Follow-up interviews verified that the only electric equipment checked by the inspector was the headgate drive, stage loader, and high-voltage power systems of the longwall. A ROE inspector trainee, who was not a qualified electrician and had minimal longwall experience, was assigned by the inspector to check permissibility of the remainder of the longwall face equipment, including the shearer, tailgate drive electric equipment, face lighting systems, and associated electrical systems, such as electric shield controls and methane monitoring systems.

The inspector also assigned the ROE inspector trainee the task of checking the interior of the shearer's explosion-proof electrical compartment for frame cracks, which the inspector stated he had found during an earlier inspection of the machine. These checks and inspections, including the observation of the calibration of installed methane monitor sensors by the inspector trainee, were not personally monitored by the inspector. No violations were identified on the longwall equipment.

The ROE inspector trainee stated he was not comfortable conducting the inspection of the longwall equipment without the inspector's presence. During a follow-up interview, the inspector was asked if he was aware that permitting the inspector trainee to check the longwall systems without his presence was contrary to Agency policy and the District 4 SOP for mentoring trainees. He stated he was aware of that fact.

The Accident Investigation electrical team cited six non-contributory violations of 30 CFR 75.1002. Three were issued as section 104(d)(2) orders, and all were evaluated as S&S. There were 51 individual safety defects identified in these violations. Some of the cited safety defects may have existed during the last regular inspection. In the following examples, safety defects that should have been recognized by an inspector, if they existed during the March 2010 inspection of the longwall equipment, are indicated by an asterisk (*).

The Accident Investigation team issued a section 104(a) citation (No. 4900517) for failing to maintain the shearer in permissible condition due to the following conditions:

1. One bolt was missing from the shearer XP enclosures retaining bar on the first compartment.*
2. Lock washers was not being used for any of the bays of the shearer control panel XP.*
3. There was a terminating diode in the shearer cable junction box that was partially terminated inside the box.
4. The incoming 4,160 volt shearer cables gland nut was not supplied with a securing wire tie.*

5. The shearer cable junction box had 10.9 bolts installed, while 12.9 bolts were the approved type.
6. A piece of flatbar (not attached) was keeping the shearer termination box in place. The mounting bolts were removed.*
7. The left shearer cutter motor RTD was not connected as shown in the approval. The wiring from the RU1 (RTD unit) was connected to the two white wires of the motor and reads 0.6 ohms.
8. The gland nut for the left cutter motor did not have a retaining screw to hold the gland nut in place.*
9. The methane monitor lens retaining strap had one bolt missing and the strap is bent.*
10. The haulage motor's ground fault protection circuitry was disabled on the JNAO controller.

The Accident Investigation team issued a section 104(d)(2) order (No. 8250024) for failing to maintain the shield electrics and lighting circuit on the longwall section in permissible and approved condition due to following conditions:

1. An opening in excess of .005 inches was present under the lid of the power supply on the #63 shield.*
2. The packing nuts on the 110 volt power cables on the power supplies on #83, 103, 123 shields had less than 1/8 inch clearance between the gland nut and gland.*
3. The snap ring on the diode receptacle inside the power supply at #173 shield was not in place.
4. The trip unit on the lighting circuit breaker was adjusted to 300 amps. The correct setting was 41 amps.
5. The lighting power supply at #43 shield had three missing flat washers.*
6. Several intrinsically safe lighting cables were spliced.*
7. The 110 volt lighting power cable was damaged at #62 shield.*
8. The 110 volt lighting power cable was damaged at #38 shield.*
9. Unapproved solenoids were being used on the valve banks of several shields.
10. The B-66 plug on the cable supplying power to the power supply for the Shield Control Center was not properly assembled. The snap ring behind the threaded outer shell had been slid back to allow the plug to be easily inserted into the receptacle.*
11. The B-66 plug on the cable supplying power to the power supply for the MSU was not properly assembled. The snap ring behind the threaded outer shell had been slid back to allow the plug to be easily inserted into the receptacle.*

Conclusion: Many of the 51 safety defects identified in the six violations cited under 30 CFR 75.1002 by the Accident Investigation team were obvious, extensive, and of a nature that depict the Operator's disregard for compliance with this standard. The Internal Review team's interviews with District 4 inspectors and evaluation of inspection notes and citations did not disclose any instances in which a permissibility violation was identified and not cited. However, the inspection of the longwall equipment conducted on March 15, 2010, was not conducted in accordance with MSHA policy and procedures. Many of the 51 safety defects cited by the Accident Investigation team likely existed at the time of the March 15, 2010, inspection. The incomplete inspection of this equipment allowed such violations to remain undetected until after the explosion on April 5, 2010.

Some District 4 regular inspectors did not have the technical skills required to conduct permissibility inspections of longwall equipment. While regular inspectors should have identified many of the permissibility violations cited by the Accident Investigation team, some violations were technical in nature and required the expertise of an electrical specialist to identify.

Corrective Actions Taken: MSHA divided District 4 into two separate districts in June 2011. The creation of the new District 12 doubled the number of Electrical Departments in the region.

Recommendations: The Administrator for Coal should collaborate with the Directors of EPD and Technical Support to provide refresher training for District 4 and 12 regular inspectors to assure they have appropriate skills to ensure uniform recognition of electrical violations.

The Administrator for Coal should direct the revision of the *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook to direct electrical or permissibility inspections of longwall systems to be conducted by electrical specialists or inspectors who hold a current MSHA electrical qualification card.

The Assistant Secretary should instruct the Directors of EPD and Technical Support to develop and provide advanced technical training on longwall mining equipment. This training should be provided to MSHA regular inspectors who are MSHA-qualified electricians and electrical specialists Agency-wide.

Violations Cited during Post-Accident Inspections outside the Explosion Area

Inspectors from outside District 4 conducted the section 103(i) spot inspections and the two regular inspections from July through December 2010 in portions of the Mine outside the explosion area. Concurrently with these mandated inspections, the Accident Investigation team conducted a spot inspection of UBB, beginning the underground portion of this inspection in late June 2010. During these inspections, the teams spent 5,796 hours on-site at UBB and issued a total of 698 citations and orders. These included violations of the following categories of underground mandatory safety standards: 212 electrical, 142 ventilation, 79 roof control, 61 combustible materials and rock dusting, and 46 fire protection.

The Internal Review team evaluated the citations and orders issued during these inspections. The Internal Review team also conducted interviews with District 4 personnel and reviewed the records of inspections conducted before the explosion. These reviews and interviews indicated that inspectors did not identify and cite some violations that existed before the explosion. Since there was no mining activity in these areas between the time of the explosion and the time of the subsequent inspections, the majority of the violations would likely have existed when District 4 inspectors made their last inspections. However, during the six months immediately preceding the explosion, District 4 inspectors and specialists identified and cited approximately 50% more violations per on-site inspection-hour than inspectors from outside District 4 did after the explosion. Between October 1, 2009, and March 31, 2010, District 4 enforcement personnel spent 1,000 hours on-site at UBB and issued 187 citations and orders.

The Internal Review team determined that some of the electrical violations existed during the last inspection completed prior to the explosion but were not identified by District 4 inspectors. Some of the violations could have been identified by regular inspectors, while only a properly-equipped electrical specialist would have been likely to identify the remainder. Other violations, such as those related to ventilation, roof control, combustible material, and fire protection, likely existed when the affected areas or equipment was last inspected. For example, several of the violations related to fire suppression devices were at belt drives installed several months before the explosion.

District 4 personnel stated during interviews that they believed the District was understaffed. Some inspectors indicated they were often hurried in order to complete inspections on time. The Internal Review team determined through interviews that several inspectors were not adequately trained on many of the Agency's policies and procedures. These issues are discussed in more detail in various sections of this report.

Conclusion: Inspectors did not recognize and cite violations that existed at the Mine during the inspections conducted prior to the explosion. Contributing factors include the inexperience and lack of training of some District 4 inspectors, the ineffective oversight provided by supervisors and managers, and the lack of specialists who could provide technical assistance during inspections and guidance to inspectors when needed.

Recommendations: These concerns, and the recommendations for addressing them, are consistent with those regarding enforcement of specific standards presented in other sections of this report.

Appendix E – MSHA Inspections and Investigations at UBB

October 1, 2009 – April 5, 2010

Event No.	Inspection Activity Code	Inspection Activity	Beginning Date	Ending Date
6284360	E02	103(i) Spot Inspection	10/16/2008	10/16/2008
6284361	E01	Regular Safety and Health Inspection	10/23/2008	12/31/2008
4119982	E02	103(i) Spot Inspection	10/29/2008	10/29/2008
4122393	E08	Non-Injury Accident Investigation	11/12/2008	11/17/2008
6284362	E02	103(i) Spot Inspection	11/12/2008	11/12/2008
6284363	E02	103(i) Spot Inspection	12/04/2008	12/04/2008
4122398	E02	103(i) Spot Inspection	12/16/2008	12/16/2008
6284364	E02	103(i) Spot Inspection	12/30/2008	12/30/2008
4119932	E01	Regular Safety and Health Inspection	01/05/2009	03/30/2009
4119933	E02	103(i) Spot Inspection	01/14/2009	01/14/2009
4123464	E02	103(i) Spot Inspection	02/02/2009	02/02/2009
4119934	E02	103(i) Spot Inspection	02/05/2009	02/05/2009
4119935	E02	103(i) Spot Inspection	02/26/2009	02/26/2009
6284370	E02	103(i) Spot Inspection	03/18/2009	03/18/2009
6285457	E02	103(i) Spot Inspection	03/30/2009	03/31/2009
4119936	E01	Regular Safety and Health Inspection	04/01/2009	06/29/2009
4118941	E34	Preliminary Special Investigation	04/03/2009	05/20/2009
4119283	E02	103(i) Spot Inspection	04/15/2009	04/15/2009
4119284	E02	103(i) Spot Inspection	04/28/2009	04/29/2009
4119285	E02	103(i) Spot Inspection	05/17/2009	05/17/2009
4119287	E02	103(i) Spot Inspection	06/02/2009	06/02/2009
6286604	E34	Preliminary Special Investigation	06/11/2009	07/15/2009
4119288	E02	103(i) Spot Inspection	06/15/2009	06/15/2009
4119290	E02	103(i) Spot Inspection	06/30/2009	06/30/2009
4121088	E19	Electrical Technical Investigation	07/01/2009	07/24/2009
4119293	E01	Regular Safety and Health Inspection	07/06/2009	09/30/2009
4123477	E02	103(i) Spot Inspection	07/09/2009	07/09/2009
4123479	E02	103(i) Spot Inspection	07/22/2009	07/22/2009
6284319	E02	103(i) Spot Inspection	07/29/2009	08/03/2009
4123480	E02	103(i) Spot Inspection	08/04/2009	08/04/2009
4123482	E02	103(i) Spot Inspection	08/17/2009	08/17/2009
4123483	E02	103(i) Spot Inspection	08/30/2009	08/30/2009
4123486	E02	103(i) Spot Inspection	09/02/2009	09/02/2009
4123487	E02	103(i) Spot Inspection	09/15/2009	09/15/2009
4123488	E02	103(i) Spot Inspection	09/29/2009	09/29/2009
6288652	E01	Regular Safety and Health Inspection	10/02/2009	12/30/2009
6288651	E02	103(i) Spot Inspection	10/08/2009	10/08/2009
6288656	E02	103(i) Spot Inspection	10/19/2009	10/19/2009
6288902	E02	103(i) Spot Inspection	10/26/2009	10/26/2009
6288904	E02	103(i) Spot Inspection	11/05/2009	11/05/2009
6288657	E02	103(i) Spot Inspection	11/19/2009	11/19/2009
6288905	E02	103(i) Spot Inspection	11/23/2009	11/23/2009
6288658	E08	Non-Injury Accident Investigation	11/24/2009	11/30/2009
6285118	E02	103(i) Spot Inspection	12/02/2009	12/02/2009
4121787	E02	103(i) Spot Inspection	12/11/2009	12/11/2009
6285119	E02	103(i) Spot Inspection	12/15/2009	12/15/2009
6288908	E02	103(i) Spot Inspection	12/22/2009	12/22/2009
6286108	E01	Regular Safety and Health Inspection	01/06/2010	03/31/2010
6288660	E02	103(i) Spot Inspection	01/07/2010	01/07/2010
6288662	E02	103(i) Spot Inspection	01/15/2010	01/15/2010
6288667	E02	103(i) Spot Inspection	01/28/2010	01/28/2010
6288669	E02	103(i) Spot Inspection	02/08/2010	02/08/2010
6288671	E02	103(i) Spot Inspection	02/17/2010	02/17/2010
6288674	E02	103(i) Spot Inspection	02/26/2010	02/26/2010
6288912	E02	103(i) Spot Inspection	03/04/2010	03/04/2010
6286817	E02	103(i) Spot Inspection	03/15/2010	03/15/2010
6284326	E02	103(i) Spot Inspection	03/25/2010	03/25/2010
6284327	E01	Regular Safety and Health Inspection	04/01/2010	06/01/2010

Appendix F – Lists of Inspection Procedure Headers

(From *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook)

Inspection Procedure Header Documentation

Mine ID: Event Number: FY: Quarter:

General	Applicable *(yes/no)	Notes *(required yes/no)	ITS *(required yes/no)	Map or Line Diagram *(required yes/no)
1. First Day Arrival In Advance of Starting Time				
2. Mine Map Review (First day for Hazards)				
3. Check In and Out System				
4. Independent Contractors				
5. Travel with Mine Examiners				
6. Inspection Shifts				
7. Man-trip Operations				

* A "Y" for yes and a "N" for no will suffice. If applicable is indicated as no, the remainder of that row will be blank.

Inspection Procedure Header Documentation

Mine ID: Event Number: FY: Quarter:

Surface Areas of Underground Mines, Surface Facilities, or Surface Mines	Applicable *(yes/no)	Notes *(required yes/no)	ITS *(required yes/no)	Map or Line Diagram *(required yes/no)
1. Auger Openings				
2. Coal Stock Pile				
3. Communications Installations				
4. Draw-Off Tunnels				
5. Drilling and Blasting				
6. Dumping Facilities				
7. Electrical Installations				
8. Equipment (Other)				
9. Equipment (Pit)				
10. Escapeways				
11. Explosives Storage				
12. Fire Fighting Equipment (Surface)				
13. Fuel Storage				
14. Ground Control				
15. Haulage Facilities (Including Belts)				
16. Health and safety Discussions				
17. Highwalls and Spoil Banks				
18. Hoisting Equipment				
19. Illumination of Work Areas				
20. Methane Tests in Required Locations (Surface)				
21. Mine Map (Surface)				
22. Non-Major Construction Sites (MSHA Form 2008-208 may also apply)				
23. Other Places Where Miners Work or Travel				
24. Potable Water (Surface)				
25. Preparation Plant				
26. Refuse Piles and Impoundemnts				
27. Sanitary Facilities (Bathhouse)				
28. Self-Contained Self-Rescuer (SCSR)				
29. Shop				
30. Surface First-Aid Equipment				
31. Thermal Dryer				
32. Travelways and Active Roadways				
33. Ventilating Fan Installations				

* A "Y" for yes and a "N" for no will suffice. If applicable is indicated as no, the remainder of that row will be blank.

Inspection Procedure Header Documentation

Mine ID: Event Number: FY: Quarter:

Underground Outby Areas	Applicable *(yes/no)	Notes *(required yes/no)	ITS *(required yes/no)	Map or Line Diagram *(required yes/no)
1. Air Courses (Including Escapeways)				
2. AMS Alarm Systems (AMS)				
3. Belts, Skip Shaft Facilities, Bunkers				
4. Blasting Practices				
5. Bleeders Including Each Check Point				
6. Diesel Fuel Storage				
7. SCSR Storage Locations				
8. Electrical Installations				
9. Haulage or Mobile Equipment				
10. Longwall Tailgate Entry				
11. Non-Pillared Worked Out Area				
12. Outby Electrical Equipment				
13. Seals				
14. Track Haulage Roads				

* A "Y" for yes and a "N" for no will suffice. If applicable is indicated as no, the remainder of that row will be blank.

Inspection Procedure Header Documentation

Mine ID: **Event Number:** **FY:** **Quarter:**

Working Sections	Applicable *(yes/no)	Notes *(required yes/no)	ITS *(required yes/no)	Map or Line Diagram *(required yes/no)
1. Boreholes in Advance of Mining				
2. Communications				
3. Dust Control Parameters				
4. Dates, Times, and Initials				
5. Escapeway map				
6. Fire Protection				
7. First-Aid Equipment				
8. Health and Safety Discussion				
9. Location of Last Open Crosscut				
10. Mining / Work Cycle				
11. Operations Under Water				
12. Potable Water (Working Section)				
13. Rock Dust Survey				
14. Sanitary Facilities				
15. Section Equipment				
14. Self-Rescue Devices (Working Section)				

* A "Y" for yes and a "N" for no will suffice. If applicable is indicated as no, the remainder of that row will be blank.

Appendix G– Section 103(i) Spot Inspections at UBB

October 1, 2009 – April 5, 2010

Event #	Date	Day of Week	Days Since Prior Spot Inspection	Area of Mine Inspected
6284360	10/16/2008	Thursday	23	2 Section
4119982	10/29/2008	Wednesday	13	1 Section
6284362	11/12/2008	Wednesday	14	1 Section
6284363	12/4/2008	Thursday	22	Return & Intake, Smoker Search
4122398	12/16/2008	Tuesday	12	3 Section
6284364	12/30/2008	Tuesday	14	3 Section
4119933	1/14/2009	Wednesday	15	1 Section & Return
4123464	2/2/2009	Monday	19	1 Section
4119934	2/5/2009	Thursday	3	2 Section
4119935	2/26/2009	Thursday	21	1 Section & Return
6284370	3/18/2009	Wednesday	20	1 Section
6285457	3/31/2009	Tuesday	12	Track & belt high spots
4119283	4/15/2009	Wednesday	16	2 Section
4119284	4/28/2009	Tuesday	13	1 Section
4119285	5/17/2009	Sunday	19	3 Section
4119287	6/2/2009	Tuesday	16	Section & X-128 Seals
4119288	6/15/2009	Monday	13	4 Section
4119290	6/30/2009	Tuesday	15	3 Section
4123477	7/9/2009	Thursday	9	1 Section
4123479	7/22/2009	Wednesday	13	1 Section & Longwall Setup
6284319	7/29/2009	Wednesday	7	1 Section
4123480	8/4/2009	Tuesday	6	1 Section
4123482	8/17/2009	Monday	13	2 Section
4123483	8/30/2009	Sunday	13	4 Section & Bandytown Fan
4123486	9/2/2009	Wednesday	3	4 Section
4123487	9/15/2009	Tuesday	13	2 Section
4123488	9/29/2009	Tuesday	14	Longwall Section
6288651	10/8/2009	Thursday	9	2 Section
6288656	10/19/2009	Monday	11	Longwall Section
6288902	10/26/2009	Monday	7	4 Section Return, Track & Escapeway
6288904	11/5/2009	Thursday	10	2 Section
6288657	11/19/2009	Thursday	14	2 Section
6288905	11/23/2009	Monday	4	1 Section
6285118	12/2/2009	Wednesday	9	Return from LW TG to bleeders
4121787	12/11/2009	Friday	9	3 Section
6285119	12/15/2009	Tuesday	4	Longwall Section, 1 Section Return
6288908	12/22/2009	Tuesday	7	2 Section
6288660	1/7/2010	Thursday	16	Longwall Section
6288662	1/15/2010	Friday	8	Longwall Belt
6288667	1/28/2010	Thursday	13	1 Section
6288669	2/8/2010	Monday	11	Longwall Section
6288671	2/17/2010	Wednesday	9	3 Section Return & Term. Rock Dust Violation
6288674	2/26/2010	Friday	9	1 Section
6288912	3/4/2010	Thursday	6	Longwall Section
6286817	3/15/2010	Monday	11	4 Section Returns & Seals
6284326	3/25/2010	Thursday	10	4 Section

Appendix H – Violations Cited during Section 103(i) Spot Inspections at UBB

October 1, 2008 – April 5, 2010

		Type Action		
Standard		**104(a)**	**104(d)(2)**	**Total**
316(b) of Act	Accident preparedness and response	1		1
72.630(b)	Drill dust control	1		1
75.202(a)	Protection from falls of roof, face and ribs	4		4
75.211(d)	Roof testing and scaling	1		1
75.220(a)(1)	Roof control plan	4		4
75.310(a)(3)	Installation of main mine fans		1	1
75.312(g)(1)	Main mine fan examinations and records	1		1
75.325(b)	Air quantity	3		3
75.333(b)(1)	Ventilation controls		1	1
75.333(b)(3)	Ventilation controls	1		1
75.333(c)(2)	Ventilation controls	1		1
75.333(d)(2)	Ventilation controls	1		1
75.333(d)(3)	Ventilation controls	1		1
75.333(f)	Ventilation controls	1		1
75.333(h)	Ventilation controls	4		4
75.342(a)(4)	Methane monitors	1		1
75.350(a)	Belt air course ventilation		1	1
75.363(a)	Hazardous conditions; posting, correcting and recording	1		1
75.364(b)(5)	Weekly examination	1		1
75.370(a)(1)	Mine ventilation plan; submission and approval	5	1	6
75.380(d)(1)	Escapeways	1		1
75.380(d)(4)	Escapeways		1	1
75.380(d)(4)(iv)	Escapeways	1		1
75.380(d)(7)	Escapeways	2		2
75.380(d)(7)(iv)	Escapeways	2		2
75.381(c)(5)(i)	Escapeways	1		1
75.400	Accumulation of combustible materials		1	1
75.400-2	Cleanup program	1		1
75.604(b)	Permanent splicing of trailing cables	1		1
75.807	Installation of high-voltage transmission cables	1		1
75.1403	Other safeguards	3		3
75.1702	Smoking; prohibition	1		1
75.1702-1	Smoking programs	1		1
75.1725(a)	Machinery and equipment; operation and maintenance	1		1
77.1102	Warning signs; smoking and open flame	1		1
77.1109(e)	Quantity and location of firefighting equipment	1		1
Total		**50**	**6**	**56**

Appendix I – Comparison of the MMU Plans for the Longwall Panels

Methane and Dust Control Plan Requirement for Longwall		MMU 031-0 (Approved May 18, 2006)	MMU 050-0 (Approved June 15, 2009)
Shearer	Make and Model	Joy 7LS	Joy 7LS
	Type spray system	Spray System Co. – Veejet Conflow or equivalent	Pressure Spray Nozzle – Not specified
	Number of sprays	114	109
	Pressure at spray block	60 p.s.i.	90 p.s.i.
Stage Loader	Scrubber system	Operated continuously w/ stage loader	Not required
	Number of sprays (per "Headgate Layout")	24	14
	Spray bars	Two (one w/6 sprays and one w/3 sprays)	Two (each w/3 sprays)
	Pressure at spray bar	60 psi	60 psi
	Spray operation	Continuous while face chain conveyor operating	Not required
Face Chain Conveyor	Water sprays	#3 cone spray every fifth shield (shield #8 through #168) - operated continuously when mining	Not required
	Spray pressure	60 p.s.i.	Not required
Shields	Water Sprays	Each shield equipped w/ water spray to be activated when shield lowered	Not required
	In adverse conditions (18" or more of rock)	Two top sprays on shields 5, 7, 10, 25, 45, 65, 85, and 105 - operated continuously during mining	Two sprays on canopy tips every 20 shields - manually activated to control dust during mining
	Infrared spray system	Activated minimum of two shield sprays in advance of shearer's cutting path	Not required
Cleaning Procedures		When shearer operating, persons with wash down hoses (located upwind of headgate shearer drum) cleaning face equipment. No one allowed within 6 shields of cleaning process	Shields will be washed weekly to prevent accumulation of dust. No one allowed within 6 shields during cleaning process
Face Ventilation	Intake air (quantity)	104,000 cfm	40,000 cfm
	Check curtain	Maintained between #4 shield and the rib to deflect intake air to face	Maintained as shown on diagram "Headgate Layout"
	Headgate (velocity)	750 fpm at #17 shield	400 fpm at #9 shield
	Mid-face (velocity)	575 fpm at #88 shield	Not required
	Tailgate (velocity)	550 fpm at #160 shield	250 fpm at #160 shield
Location of Persons	During cutting operations	No persons inby or downwind of the headgate side shearer drum	No persons inby or downwind of shearer carriage
	Short-term Exception - Correcting Hazard; making exam or repair	Must wear Racal air-purifying helmet or other equivalent air induced respirators	Limited to 30 minutes with use of approved respirator
	While advancing shields	All persons upwind of moving shields	Not required
Respiratory Protection		All face workers (head and tail shearer operators and jack setters) must wear Racal air-purifying helmet or other equivalent air induced respirators	All persons working at face will be offered the use of Air Stream helmets
Personnel Training		Refresher training discussed prior to every shift concerning respirable dust parameters of plan and recorded in fireboss book	Not required
Dust Control Parameter Checks		Additional check at mid-point of each production shift	Additional check not required

Appendix J – Inundation by Water of the 1 North Longwall Headgate

The MSHA Accident Investigation team concluded from inspector notes and witness testimony that a water inundation occurred on November 16, 2009. Further, the Accident Investigation report stated: "Thus, it is plausible that differential subsidence above the 1 North panel occurred beneath the barrier, causing joints or fractures to open sufficiently to allow water and air communication between the Eagle and Powellton seams." The water flooded the bleeder and return entries in Headgate 1 North inby the longwall face. As the water accumulated in the bleeder system, it increasingly restricted air flow, which also caused the fan pressure to increase.

On November 13, 2009, the fan pressure recorded at the Bandytown Fan was approximately -4.0 inches of water.[73] On Monday, November 16, the fan pressure began to gradually increase. By Wednesday, November 18, a fan pressure of -17.0 inches of water was recorded. During this time period, a hand-written notation on the Bandytown Fan pressure chart indicated "pumps down." The fan pressure chart is shown in Figure 22.

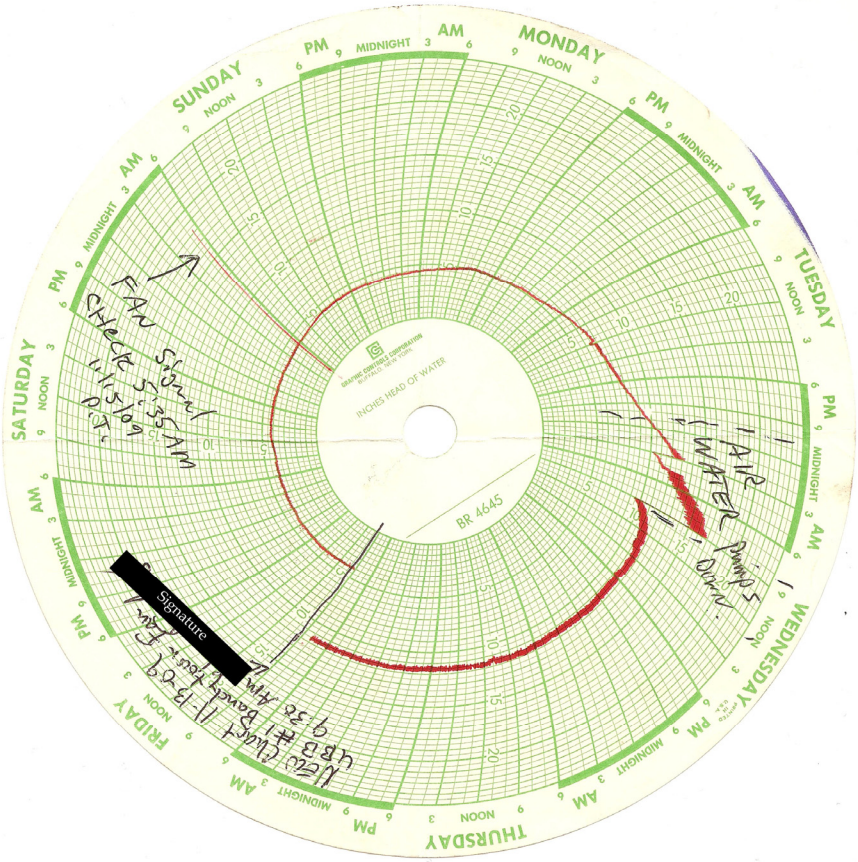


Figure 22 - Bandytown Fan Chart from November 2009

On November 19, 2009, a District 4 ventilation specialist examined the longwall headgate entries and observed an accumulation of water 12 to 15 inches in depth in the No. 3 entry extending a distance of 300 feet from crosscut 55 to 58. At that time according to production reports, the longwall face was at crosscut 54 on Headgate 1 North. The specialist issued a section 104(a) citation (No. 6612944) for this violation of 30 CFR 75.364(b)(2). During his interview with the Internal Review team, the specialist stated that the water level was not increasing. At that time, the fan pressure on the Bandytown Fan chart was reduced to approximately -11.5 inches of water as a result of pumping.

[73] Exhausting fan pressures are recorded as negative numbers. As the fan pressure increases, the recorded value becomes more negative. For example, a fan pressure of -17 inches is more than three times a fan pressure of -5 inches.

On December 14, 2009, another District 4 ventilation specialist traveled the No. 3 entry of Headgate 1 North. The entry was required to be separated from the longwall gob by permanent stoppings to accommodate a return air course for the Headgate #22 development section. The specialist found water accumulations up to 48 inches deep in the return entry extending from crosscut #73 to #134, a distance of approximately 6,000 feet. At that time, according to production reports, the longwall face was at crosscut 50 on Headgate 1 North. He issued a section 104(a) citation (No. 8085240) for a violation of 30 CFR 75.364(b)(2) because the return air course could not be traveled in its entirety. In addition, the specialist issued a section 107(a) order (No. 8085239) for slipping/tripping hazards where miners were working to install a stopping-like wall in the water. During his interview, the specialist stated, "I've got personal testimony of firebosses that said they traveled up to their chest in water." Regarding the source of the water, he stated, "I think with the company they just alluded to the mine above them. You know, they didn't specify. I never did look at any maps that showed any pools of water. …I would presume that person would be Everett Hagar [mine superintendent] that I talked to during the day there when I inspected concerning that water which would have been in December."

The water accumulated in the No. 3 entry of Headgate 1 North posed a continued hazard to miners traveling and working in the area and was duly cited by both District 4 ventilation specialists. At the time of the inspections, neither specialist recognized the water accumulation as an inundation. Further, neither specialist examined the fan chart which provided additional evidence of an inundation. The Operator did not immediately notify MSHA of the inundation, as required by 30 CFR 50.10, nor did it report the accident to MSHA as required by 30 CFR 50.20(a).

On December 18, 2009, a ventilation plan supplement was approved in which the Operator proposed discontinuing the use of the No. 3 entry as the Headgate #22 section return. The return was redirected through the North Glory Mains and across the Panel #1 crossover to the No. 1 entry of Tailgate 1 North. This change allowed the Operator to evaluate the ventilation of the No. 3 entry as part of the bleeder system rather than travel and examine the entry as required for a return air course. As a result, both the citation and order were terminated on December 30, 2009, without the Operator pumping the remaining water from the area.

Appendix K – Review of Longwall Pillar Designs at UBB

U.S. Department of Labor

Mine Safety and Health Administration
Pittsburgh Safety & Health Technology Center
P.O. Box 18233
Pittsburgh, PA 15236

Roof Control Division
10BA115

December 8, 2010

MEMORANDUM FOR JOHN A. KUZAR [redacted] Initials JAK
District Manager, CMS&H District 1

[redacted] Signature

THROUGH: KENNETH G. FIELDS
Chief, Pittsburgh Safety and Health Technology Center

[redacted] Signature

JOSEPH A. CYBULSKI
Chief, Roof Control Division

[redacted] Signature

FROM: MICHAEL GAUNA
Mining Engineer, Roof Control Division

SUBJECT: Review of Longwall Pillar Designs at Performance Coal Company, Upper Big Branch Mine-South, Raleigh County, West Virginia, MSHA I. D. No. 46-08436

Background

As requested, the longwall pillar designs for Headgate 1 North and Tailgate 1 North at the Upper Big Branch Mine-South (UBB) operating in the Eagle coal seam were evaluated by the Roof Control Division (RCD). No undermining exists in the region. Overmining exists in the Powellton coal seam. In order to establish a comparative reference, the historical pillar designs for longwall panels to the south were also calculated. The historical areas evaluated were Tailgate 11 (western four-entry portion), Headgate 11 (western portion), Headgate 12 (west of overlying Black Knight belt system), Headgate 14 (west of overlying Black Knight belt system), Headgate 15 (west of overlying Black Knight belt system), and Headgate 16 (west of overlying Black Knight belt system). The NIOSH Analysis of Longwall Pillar Stability (ALPS - version 5.2.07) software was used and NIOSH Analysis of Multiple Seam Stability (AMSS - version 1.0.56) software was used. The ALPS analyses were conducted to evaluate the longwall gate pillar designs where no multiple seam interaction exists from workings in the overlying coal seam. The AMSS analyses focus on longwall gate pillar areas that are overlain by Powellton seam gob-solid boundaries. The ALPS and AMSS software are older versions, rather than the current October 2010 software, that were used to be consistent with evaluations which would have been conducted prior to October 2010.

Analysis Parameters

The pillar sizes and the longwall panel widths were taken from an AutoCAD map furnished for the mine. Depth of cover was determined by placing the electronic versions of the U.S.G.S. topographic maps for the region onto the mine AutoCAD map and calculating the depth based on the mine floor elevations and the topographic elevations.

Based on discussions with the UBB investigation team personnel, a mining height of 7 feet was used to account for the typically 5-foot coal height and the additional typical 4 feet of rock mined above the coal seam (practice is to add 50% of competent mined rock thickness to the coal seam height). A 21-foot mining width was used to account for mining widths that reportedly typically exceed 20 feet. The roof quality is considered to be moderate strength. The database for the NIOSH Coal Mine Roof Rating (CMRR) lists 7 Eagle seam CMRR values that have an average CMRR of 51. For comparative discussions, the RCD assigned the Coal Mine Roof Rating (CMRR) to have a value of 51 for UBB.

The overlying workings from the Powellton coal seam (closest overlying workings) could impact the UBB Eagle coal seam mining. Consequently, multiple seam mining conditions were evaluated with AMSS calculations. There are no underlying workings. For the AMSS calculations, the Powellton coal seam workings were scanned and overlain on the UBB AutoCAD map. The interburden between the two seams was obtained by calculating the difference between the floor elevations for the two coal seams. In the areas where AMSS calculations were conducted, the difference in floor elevations ranged from 160 to 205 feet and was assigned as the interburden. The interburden was not reduced by the Powellton mining height because the elevation surveying accuracy is unknown and reducing the interburden by the 8 to 10 feet of mining height does not significantly affect the calculations. The Powellton seam gob and barrier pillar widths were measured from the scanned image of the overlying Powellton seam workings.

ALPS Analyses

The ALPS calculates stability factors (SF) for five loading conditions: development, headgate (loading from the longwall front abutment), tailgate (loading from the longwall front abutment and abutment loading from the previously mine longwall panel), bleeder (loading along a pillar system from an adjoining extracted longwall panel) and isolated loading (loading onto a pillar system positioned between two fully extracted longwall panels). The relevant loading conditions for the UBB analyses are headgate, bleeder, and tailgate loading and are shown in the following memo tables. The ALPS offers two pillar strength calculation approaches: Bieniawski (minimum pillar width used in the strength calculation, know as Classic ALPS) and Mark-Bieniawski (pillar width and length used in the strength calculation, know as ALPS(R) output). For consistency with current calculation techniques the ALPS(R) output is most appropriate and should be used. The NIOSH offers design guidelines (suggested stability factors) only for the tailgate loading condition. The guideline is based on the mine site CMRR. For the 51 CMRR assigned to UBB, the NIOSH suggested minimum tailgate stability factor is 1.18. The ALPS analyses ignore the impact from mining in the overlying Powellton coal seam.

It must be emphasized that the suggested tailgate pillar stability factor must also be accompanied with supplemental support (typically roof-to-floor standing support) installed in the tailgate entry. The suggested SF criteria is derived from a case history database that had failures and success based on the tailgate functioning satisfactorily. The tailgate conditions were dependent on pillar performance plus the performance of the installed supplemental support and were also found to be dependent on the quality of the roof (mine site CMRR). Consequently, when conducting an ALPS evaluation, you could have an adequate pillar size, but, could have a tailgate failure if insufficient supplemental support is installed. The opposite could also occur, where a pillar system with an inadequate SF could function satisfactorily if a very robust and substantial support system is employed. The situation to avoid is to have a low tailgate pillar system SF and also an inadequate supplemental support system.

Table 1a summarizes the ALPS analyses for the historical mining area to the south of the 1 North longwall panel. Table 1b summarizes the ALPS analyses for the 1 North longwall panel. Tables 1a and 1b with all the calculation parameters are shown in Appendix 1. Tailgate 1 North, when functioning as a bleeder, does not meet the NIOSH tailgate SF criteria. Tailgate 11, when functioning as a bleeder, meets the NIOSH tailgate SF criteria. Tailgate 1 North has SF values that are approximately 80% of the SF values achieved with the historical Tailgate 11 design. Headgate 1 North and Headgates 11 through 16 do not meet the NIOSH tailgate SF criteria. Headgates 11 through 16 have tailgate SF values that range from 69% to 86% of the suggested NIOSH criteria. Headgate 1 North has a SF that is less than the historical cases at only 64% of the suggested NIOSH criteria.

Table 1a - ALPS Anaylses; Historical LW Mining Tailgate 11 to Headgate 16

Area	Pillar Design - centers, ft	Depth (1), ft	Type Overlying MS Boundary	**ALPS(R) SF Active LW Face (HG Loading)**	**ALPS(R) SF Bleeder Loading**	**ALPS(R) SF TG Loading**	**Percent of NIOSH Suggested ALPS(R) TG SF=1.18 for CMRR 51**	**Meets Suggested ALPS(R) TG SF**	NIOSH AMSS Projected Ground Condition (2)
TG 11	100x100 100x100 100x100	1020	N/A	**1.74**	**1.39**	N/A	N/A	Bleeder Exceeds TG Criteria	N/A
HG 11	90x105 115x105	1035	N/A	**1.64**	**1.24**	**0.91**	**77.1%**	No	N/A
HG 12	90x105 115x105	980	N/A	**1.76**	**1.34**	**0.99**	**83.9%**	No	N/A
HG 14	90x105 115x105	970	N/A	**1.78**	**1.36**	**1.01**	**85.6%**	No	N/A
HG 15	90x105 115x105	1020	N/A	**1.67**	**1.27**	**0.93**	**78.8%**	No	N/A
HG 16	90x105 115x105	1115	N/A	**1.49**	**1.12**	**0.81**	**68.6%**	No	N/A

Table 1b - ALPS Anaylses; Tailgate 1 North & Headgate 1 North

Area	Pillar Design - centers, ft	Depth (1), ft	Type Overlying MS Boundary	**ALPS(R) SF Active LW Face (HG Loading)**	**ALPS(R) SF Bleeder Loading**	**ALPS(R) SF TG Loading**	**Percent of NIOSH Suggested ALPS(R) TG SF=1.18 for CMRR 51**	**Meets Suggested ALPS(R) TG SF**	NIOSH AMSS Projected Ground Condition (2)
TG 1N east	79x100 79x100 79x100 79x100	1020	N/A	**1.40**	**1.13**	N/A	N/A	Bleeder Does Not Exceeds TG Criteria	N/A
HG 1N	100x100 100x100	1115	N/A	**1.39**	**1.04**	**0.75**	**63.6%**	No	N/A

Note: (1) = High Average Depth for gate entries (3 x Max Depth + Min Depth) / 4
(2) = Color code ground condition refers to required roof support (Local Stability requirements).
The Stability Factors (SF) refer to the required pillar design (Global Stability requirements).

AMSS Analyses

The AMSS evaluates the potential impact from overlying or underlying older workings onto the pillar design being evaluated. The AMSS offers two modes of analysis: a modified ALPS analysis for multiple seam mining conditions and a modified pillar recovery analysis (ARMPS-Analysis of Retreat Mining Pillar Stability) that is adjusted for multiple seam conditions. The multiple seam mining stresses are estimated and added onto the pillar design being studied. In the case for UBB, AMSS adjusts the ALPS analyses to account for these multiple seam stresses from the gob boundaries in the overlying Powellton coal seam and furnishes an evaluation of the Eagle coal seam pillar design. The pillar design assessment is referred to as a global stability assessment. The AMSS also furnishes an estimate of the impact on mine roof and rib conditions

to ascertain if additional roof and/or rib support may be needed. The roof/rib support assessment is referred to as a local stability assessment. The AMSS local stability outputs are coded as green, yellow, and red. The green and yellow codes generated for the UBB analyses are defined in the following memo tables. The AMSS analyses are conducted for specific localized areas where stress concentrations from the other seam will affect a particular area of the mine. In the case for UBB, it will be Powellton gob boundaries impacting the UBB longwall gate pillars. The areas where the AMSS analyses were conducted are outline in Appendix 2 which is a map of the UBB workings.

Table 2a summarizes the AMSS analyses for the historical mining area to the south of the 1 North longwall panel. Table 2b summarizes the AMSS analyses for the 1 North longwall panel. Tables 2a and 2b with all the calculation parameters are shown in Appendix 3. Tailgate 1 North (except the AMSS evaluation at crosscut 94) and the historical Tailgate 11, when functioning as a bleeder, meet the NIOSH tailgate SF criteria. Tailgate 11 has SF values that range from 2.00 to 2.76 for the regions where AMSS was calculated. Tailgate 1 North has SF values that are lower and range from 1.12 to 1.51. The one calculation site on Headgate 1 North and seven of the ten calculation sites for Headgates 11 through 16 do not meet the NIOSH tailgate SF criteria. The sites that do not meet criteria for Headgates 11 through 16 have tailgate SF values that range from 63% to 93% of the suggested NIOSH criteria. The Headgate 1 North AMSS site has a SF that is 65% of the suggested NIOSH criteria.

The RCD cannot comment on the actual ground conditions encountered with the longwall extraction for the sites evaluated. The AMSS local stability prediction for Tailgate 1 North and Headgate 1 North is a “Green” condition which suggests that a major interaction is unlikely. AMSS local stability predictions for the Headgates 11 through 16 sites are a combination of “Green” and “Yellow” conditions. A “Yellow” condition suggests that a major interaction is considered likely unless a pattern of supplemental support is installed. Rib instability is also likely.

Table 2a - AMSS Anaylses; Historical Longwall Mining Tailgate 11 to Headgate 16

Area	Pillar Design - centers, ft	Depth (1), ft	Type Overlying MS Boundary	ALPS(R) SF Active LW Face (HG Loading)	ALPS(R) SF Bleeder Loading	ALPS(R) SF TG Loading	Percent of NIOSH Suggested ALPS(R) TG SF=1.18 for CMRR 51	Meets Suggested ALPS(R) TG SF	NIOSH AMSS Projected Ground Condition (2)
TG 11 Xcut spad10593	100x100 100x100 100x100	550	Gob Solid	3.11	2.76	N/A	N/A	Bleeder Exceeds TG Criteria	Green
TG 11 Xcut spad10819	100x100 100x100 100x100	555	Gob Solid	2.85	2.55	N/A	N/A	Bleeder Exceeds TG Criteria	Green
TG 11 Xcut spad 10899	100x100 100x100 100x100	685	Gob Solid	2.30	2.00	N/A	N/A	Bleeder Exceeds TG Criteria	Green
HG 11 Xcut 125	90x105 115x105	930	Gob Solid	1.62	1.29	0.99	83.9%	No	Green
HG 11 Xcut 136	90x105 115x105	935	Remnant	1.41	1.15	0.91	77.1%	No	Yellow
HG 11 Xcut 146	90x105 115x105	745	Gob Solid	2.07	1.71	1.36	115.3%	Yes	Green
HG 12 Xcut 82	90x105 115x105	690	Remnant	1.89	1.62	1.34	113.6%	Yes	Yellow - Almost Green
HG 12 Xcut 138	90x105 115x105	1125	Gob Solid	1.30	1.00	0.74	62.7%	No	Yellow - Almost Green
HG 14 Xcut 51	90x105 115x105	860	Gob Solid	1.74	1.41	1.10	93.2%	No	Green
HG 14 Xcut 62	90x105 115x105	670	Gob Solid	2.37	1.97	1.60	135.6%	Yes	Green
HG 14 Xcut 134	90x105 115x105	960	Gob Solid	1.57	1.24	0.95	80.5%	No	Green
HG 15 Xcut 63	90x105 115x105	1065	Remnant	1.24	0.99	0.75	63.6%	No	Yellow
HG 16 Xcut 16	90x105 115x105	1070	Gob Solid	1.37	1.07	0.80	67.8%	No	Green

Table 2b - AMSS Anaylses; Tailgate 1 North & Headgate 1 North

Area	Pillar Design - centers, ft	Depth (1), ft	Type Overlying MS Boundary	ALPS(R) SF Active LW Face (HG Loading)	ALPS(R) SF Bleeder Loading	ALPS(R) SF TG Loading	Percent of NIOSH Suggested ALPS(R) TG SF=1.18 for CMRR 51	Meets Suggested ALPS(R) TG SF	NIOSH AMSS Projected Ground Condition (2)
TG 1N Xcut 75	79x100 79x100 79x100 79x100	725	Gob Solid	1.73	1.51	N/A	N/A	Bleeder Exceeds TG Criteria	Green
TG 1N Xcut 94	84x100 78x100 78x100 78x100	935	Gob Solid	1.33	1.12	N/A	N/A	Bleeder Does Not Meets TG Criteria	Green
TG 1N Xcut 100	84x100 78x100 78x100 78x100	800	Gob Solid	1.58	1.36	N/A	N/A	Bleeder Exceeds TG Criteria	Green
HG 1N Xcut 71	100x100 100x100	1050	Gob Solid	1.33	1.03	0.77	65.3%	No	Green

Note: (1) = Average depth in vicinity of overling gob/remnant boundary
(2) = Color code ground condition refers to required roof support (Local Stability requirements).
The Stability Factors (SF) refer to the required pillar design (Global Stability requirements).
Green: A major interaction is unlikely.
Yellow: A major interaction should be considered likely unless a pattern of supplemental roof support (cable bolts or equivalent) is installed. Rib instability is also likely.

The information presented in this memorandum is based on the information submitted from various sources without an underground assessment and should be considered in that context. If the RCD can be of further assistance, or if you have any questions regarding this memorandum, please contact Mike Gauna at 304-547-2311.

Appendix 1
UBB ALPS Evaluation including Calculation Parameters

Table 1a - ALPS Anaylses; Historical LW Mining Tailgate 11 to Headgate 16

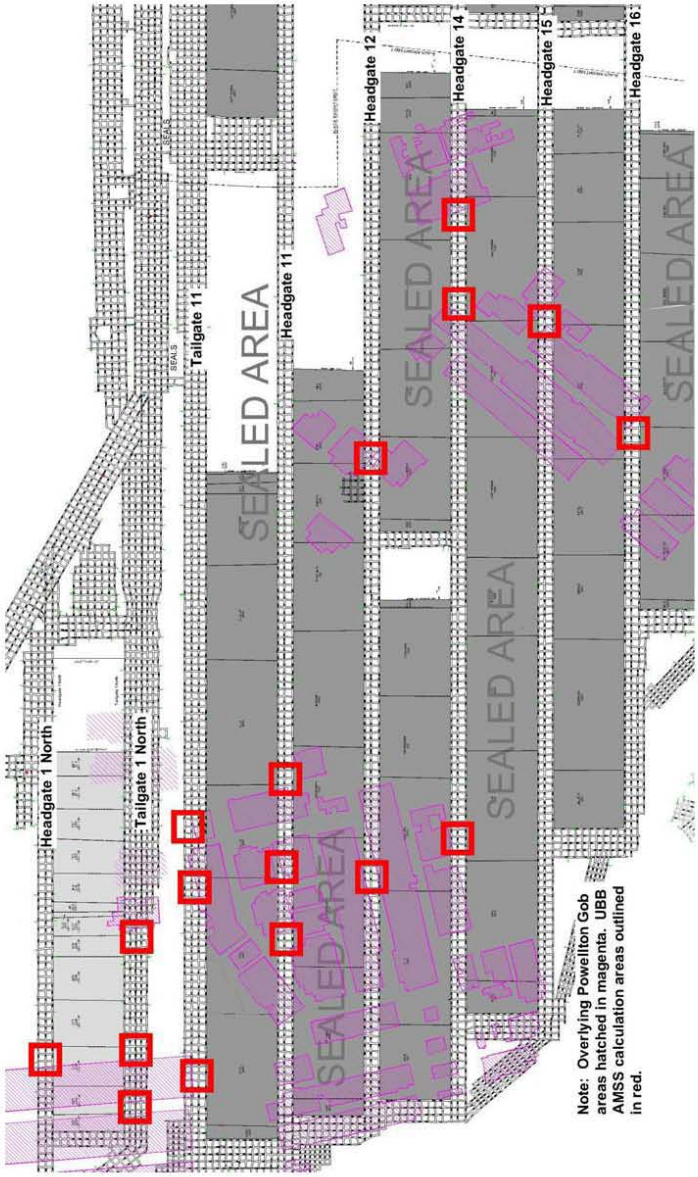
Area	Pillar Design - centers, ft	Depth (1), ft	Type Overlying MS Boundary	ALPS(R) SF Active LW Face (HG Loading)	ALPS(R) SF Bleeder Loading	ALPS(R) SF TG Loading	Percent of NIOSH Suggested ALPS(R) TG SF=1.18 for CMRR 51	Meets Suggested ALPS(R) TG SF	NIOSH AMSS Projected Ground Condition (2)	Eagle Seam Miniing Height, ft	Eagle Seam Minng Width, ft	Eagle Seam LW Panel Center Width, ft	Interburden, ft	Powellton Seam Gob 1 Width, ft	Powellton Seam Remnant Width, ft	Powellton Seam Gob 2 Width, ft	Powellton Seam Mining Height, ft
TG 11	100x100 100x100 100x100	1020	N/A	**1.74**	**1.39**	N/A	N/A	Bleeder Exceeds TG Criteria	N/A	7	21	1020	N/A	N/A	N/A	N/A	N/A
HG 11	90x105 115x105	1035	N/A	**1.64**	**1.24**	**0.91**	**77.1%**	No	N/A	7	21	1020	N/A	N/A	N/A	N/A	N/A
HG 12	90x105 115x105	980	N/A	**1.76**	**1.34**	**0.99**	**83.9%**	No	N/A	7	21	1020	N/A	N/A	N/A	N/A	N/A
HG 14	90x105 115x105	970	N/A	**1.78**	**1.36**	**1.01**	**85.6%**	No	N/A	7	21	1020	N/A	N/A	N/A	N/A	N/A
HG 15	90x105 115x105	1020	N/A	**1.67**	**1.27**	**0.93**	**78.8%**	No	N/A	7	21	1020	N/A	N/A	N/A	N/A	N/A
HG 16	90x105 115x105	1115	N/A	**1.49**	**1.12**	**0.81**	**68.6%**	No	N/A	7	21	1020	N/A	N/A	N/A	N/A	N/A

Table 1b - ALPS Anaylses; Tailgate 1 North & Headgate 1 North

Area	Pillar Design - centers, ft	Depth (1), ft	Type Overlying MS Boundary	ALPS(R) SF Active LW Face (HG Loading)	ALPS(R) SF Bleeder Loading	ALPS(R) SF TG Loading	Percent of NIOSH Suggested ALPS(R) TG SF=1.18 for CMRR 51	Meets Suggested ALPS(R) TG SF	NIOSH AMSS Projected Ground Condition (2)	Eagle Seam Miniing Height, ft	Eagle Seam Minng Width, ft	Eagle Seam LW Panel Center Width, ft	Interburden, ft	Powellton Seam Gob 1 Width, ft	Powellton Seam Remnant Width, ft	Powellton Seam Gob 2 Width, ft	Powellton Seam Mining Height, ft
TG 1N east	79x100 79x100 79x100 79x100	1020	N/A	**1.40**	**1.13**	N/A	N/A	Bleeder Does Not Exceeds TG Criteria	N/A	7	21	1024	N/A	N/A	N/A	N/A	N/A
HG 1N	100x100 100x100	1115	N/A	**1.39**	**1.04**	**0.75**	**63.6%**	No	N/A	7	21	1024	N/A	N/A	N/A	N/A	N/A

Note: (1) = High Average Depth for gate entries (3 x Max Depth + Min Depth) / 4
(2) = Color code ground condition refers to required roof support (Local Stability requirements).
The Stability Factors (SF) refer to the required pillar design (Global Stability requirements).

Appendix 2
Location of UBB AMSS Evaluations



Appendix 3
UBB AMSS Evaluation including Calculation Parameters

Table 2a - AMSS Anaylses; Historical Longwall Mining Tailgate 11 to Headgate 16

Area	Pillar Design - centers, ft	Depth (1), ft	Type Overlying MS Boundary	ALPS(R) SF Active LW Face (HG Loading)	ALPS(R) SF Bleeder Loading	ALPS(R) SF TG Loading	Percent of NIOSH Suggested ALPS(R) TG SF=1.18 for CMRR 51	Meets Suggested ALPS(R) TG SF	NIOSH AMSS Projected Ground Condition (2)	Eagle Seam Miniing Height, ft	Eagle Seam Mining Width, ft	Eagle Seam LW Panel Center Width, ft	Interburden (3), ft	Powellton Seam Gob 1 Width, ft	Powellton Seam Remnant Width, ft	Powellton Seam Gob 2 Width, ft	Powellton Seam Mining Height, ft
TG 11 Xcut spad10593	100x100 100x100 100x100	550	Gob Solid	3.11	2.76	N/A	N/A	Bleeder Exceeds TG Criteria	Green	7	21	1020	180	270	N/A	N/A	6
TG 11 Xcut spad10819	100x100 100x100 100x100	555	Gob Solid	2.85	2.55	N/A	N/A	Bleeder Exceeds TG Criteria	Green	7	21	1020	180	450	N/A	N/A	6
TG 11 Xcut spad 10899	100x100 100x100 100x100	685	Gob Solid	2.30	2.00	N/A	N/A	Bleeder Exceeds TG Criteria	Green	7	21	1020	190	600	N/A	N/A	6
HG 11 Xcut 125	90x105 115x105	930	Gob Solid	1.62	1.29	0.99	83.9%	No	Green	7	21	1020	185	450	N/A	N/A	6
HG 11 Xcut 136	90x105 115x105	935	Remnant	1.41	1.15	0.91	77.1%	No	Yellow	7	21	1020	185	475	110	380	6
HG 11 Xcut 146	90x105 115x105	745	Gob Solid	2.07	1.71	1.36	115.3%	Yes	Green	7	21	1020	180	560	N/A	N/A	6
HG 12 Xcut 82	90x105 115x105	690	Remnant	1.89	1.62	1.34	113.6%	Yes	Yellow - Almost Green	7	21	1020	160	490	80	500	6
HG 12 Xcut 138	90x105 115x105	1125	Gob Solid	1.30	1.00	0.74	62.7%	No	Yellow - Almost Green	7	21	1020	185	490	N/A	N/A	6
HG 14 Xcut 51	90x105 115x105	860	Gob Solid	1.74	1.41	1.10	93.2%	No	Green	7	21	120	160	550	N/A	N/A	6
HG 14 Xcut 62	90x105 115x105	670	Gob Solid	2.37	1.97	1.60	135.6%	Yes	Green	7	21	1020	175	330	N/A	N/A	6
HG 14 Xcut 134	90x105 115x105	960	Gob Solid	1.57	1.24	0.95	80.5%	No	Green	7	21	1020	190	450	N/A	N/A	6
HG 15 Xcut 63	90x105 115x105	1065	Remnant	1.24	0.99	0.75	63.6%	No	Yellow	7	21	1020	170	400	150	420	6
HG 16 Xcut 16	90x105 115x105	1070	Gob Solid	1.37	1.07	0.80	67.8%	No	Green	7	21	1020	173	430	N/A	N/A	6

Table 2b - AMSS Anaylses; Tailgate 1 North & Headgate 1 North

Area	Pillar Design - centers, ft	Depth (1), ft	Type Overlying MS Boundary	ALPS(R) SF Active LW Face (HG Loading)	ALPS(R) SF Bleeder Loading	ALPS(R) SF TG Loading	Percent of NIOSH Suggested ALPS(R) TG SF=1.18 for CMRR 51	Meets Suggested ALPS(R) TG SF	NIOSH AMSS Projected Ground Condition (2)	Eagle Seam Miniing Height, ft	Eagle Seam Mining Width, ft	Eagle Seam LW Panel Center Width, ft	Interburden (3), ft	Powellton Seam Gob 1 Width, ft	Powellton Seam Remnant Width, ft	Powellton Seam Gob 2 Width, ft	Powellton Seam Mining Height, ft
TG 1N Xcut 75	79x100 79x100 79x100 79x100	725	Gob Solid	1.73	1.51	N/A	N/A	Bleeder Exceeds TG Criteria	Green	7	21	1024	180	390	N/A	N/A	6
TG 1N Xcut 94	84x100 78x100 78x100 78x100	935	Gob Solid	1.33	1.12	N/A	N/A	Bleeder Does Not Meets TG Criteria	Green	7	21	1024	186	595	N/A	N/A	6
TG 1N Xcut 100	84x100 78x100 78x100 78x100	800	Gob Solid	1.58	1.36	N/A	N/A	Bleeder Exceeds TG Criteria	Green	7	21	1024	194	595	N/A	N/A	6
HG 1N Xcut 71	100x100 100x100	1050	Gob Solid	1.33	1.03	0.77	65.3%	No	Green	7	21	1024	205	595	N/A	N/A	6

Note: (1) = Average depth in vicinity of overling gob/remnant boundary
(2) = Color code ground condition refers to required roof support (Local Stability requirements).
The Stability Factors (SF) refer to the required pillar design (Global Stability requirements).
Green: A major interaction is unlikely.
Yellow: A major interaction should be considered likely unless a pattern of supplemental roof support (cable bolts or equivalent) is installed. Rib instability is also likely.

Note: (3) = Based on Powellton to Eagle seam floor contours with Eagle seam mining height ignored

Also, in the AMSS output, the calculated multiple seam ALPS SF is compared to the suggested Bieniawski - Classic ALPS SF value rather than the ALPS(R) suggested SF value shown in this table

Appendix L – Summary of Deficiencies Common to District 4 Accountability Audits and the UBB Internal Review

Issue	OA Reviews	HQ Review	District Level Review	UBB Internal Review
Level of enforcement does not always reflect repeat violations	X			X
Evaluations of gravity, negligence, and number of persons affected do not always appear commensurate with the type of violations cited	X	X		X
Multiple violations were sometimes listed on a single citation	X			X
Peer Reviews were not thorough and did not contain a means for follow-up	X			
Insufficient time spent on "off shifts" during regular inspections	X		X	
SCSRs were listed as being inspected but the required documentation (manufacturer, model, and serial number) was not present		X		X
Pumps were inspected and noted but not placed in the ITS		X		X
Inspection tracking map did not list start/stop dates and the extent of daily travel was not clearly documented on the map		X	X	X
Evaluation of "who knew" was not always adequately documented or rationalized		X		X
Two citations were issued for inadequate rock dust, but there was no evidence that rock dust samples were collected		X		
Part of the mine inspection was not completed. The map and inspection notes did not reflect that an intake entry was traveled		X		X
Daily cover sheet (MSHA Form 7000-10I) did not specify the type of shift for each inspection day (production, maintenance, or idle)			X	X
Inspectors did not specify in hard copy notes that an inspection for imminent dangers was conducted as soon as practical after arrival on the section			X	X
Hard copy notes did not state that the inspector arrived at the mine in advance of the shift start time on the first day of the inspection			X	X
Hard copy notes did not indicate there had been an examination for DTI (dates, times, and initials) when inspecting on an MMU			X	X
On occasion, the daily sheet did not list the inspection areas for that day			X	
A few daily sheets did not list the arrival time. Also, dates in the hard copy notes did not always correspond with dates in the IT system			X	X
Inspections were not conducted on all working shifts			X	X
A rock dust survey collected did not include samples from a representative number of crosscuts			X	X
During a respirable dust survey, on the 021-0 MMU, conducted 11/14/2008, the inspector checked the 020-0 equipment the same shift. The 2000-86 form did not document the length of the shift in the comments section. Only 7 hours of underground time were submitted on his T&A including 6 hours on the MMU and 1 hour outby			X	
The six noise survey 2000-84 forms submitted the first quarter of fiscal 2009 did not contain the names of the miners surveyed			X	
On one date, the CMI indicated MMU activity in his notes; however, his time and activity (T&A) report does not indicate any MMU time			X	

Appendix M – MSHA Technical Support Memoranda on UBB Floor Bursts

Rich / Jon B.

U.S. Department of Labor

Mine Safety and Health Administration
Pittsburgh Safety & Health Technology Center
P.O. Box 18233
Pittsburgh, PA 15236

Roof Control Division 04AA34

3/8
Bill:
Thought you may find this interesting

March 4, 2004

MEMORANDUM FOR JOHN M. PYLES Initials JMP
Acting District Manager, CMS&H District 4
Signature

Signature John Pyles

THROUGH: EDWARD J. MILLER
Chief, Pittsburgh Safety and Health Technology Center
Signature - Joseph A. Cybulski

for M. TERRY HOCH
Chief, Roof Control Division
Signature

FROM: JOHN R. COOK
Mining Engineer, Roof Control Division
Signature

SANDIN E. PHILLIPSON
Geologist, Roof Control Division

SUBJECT: Evaluation of Controls on Floor Bursts at Performance Coal Company, Upper Big Branch Mine - South, MSHA I. D. No. 46-08436

Summary

As requested by CMS&H District 4, an evaluation of the controls on a floor burst that occurred on February 18, 2004, was conducted on February 24, 2004. Observation of maps prepared by the mine, combined with underground observations of subtle geologic features and information supplied by mine management, suggest that several factors may have contributed to the formation of the floor fracture from which natural gas was released: (1) critical overburden value of 1100 feet; (2) critical Eagle/Lower Eagle interburden thickness of 12 feet; (3) location of barrier pillar in the overlying Powellton seam; and (4) projected zone of geologic weakness. Although these factors may have influenced the formation of the floor fracture, the source of gas is more likely

to be a pressurized geological reservoir, rather than bleed-off from a coal seam. Thus, the Lower Eagle coal seam may have trapped gas beneath structurally high areas, but it is less likely that the Lower Eagle coal seam is the actual source of the gas.

The mine has prepared a variety of maps to portray overburden, interburden, overmining, and structural contour relationships and appears to have devoted considerable effort to understanding the controls on the floor bursts. Mine personnel reported that, in the subsequent longwall panel, degasification wells will be developed into the Lower Eagle seam in an attempt to decrease the potential for future outbursts. This appears to be a reasonable plan. Additionally, the construction of a hazard map, identifying overlapping zones of overburden in excess of 1100 feet, Eagle/Lower Eagle interburden of less than 13 feet, structural domes and arches in the Lower Eagle seam, position of barrier pillars in the overlying Powellton seam, projections of lineaments and the identified slickenside zone are suggested.

In addition to the authors, the following persons were present during the underground evaluation or related discussions:

George Levo, Senior Mining Engineer, Performance Coal Company
Bill Downey, Longwall Coordinator, Upper Big Branch Mine
Don Winston, Mining Engineer, CMS&H District 4

Background

As requested by CMS&H District 4, an evaluation of the controls of a floor burst that occurred on February 18, 2004, was conducted at Performance Coal Company's Upper Big Branch Mine on February 24, 2004. The floor burst occurred at approximately 40-41 Crosscut in the Headgate 17 Longwall Panel, and gasses issued from a fracture in the floor behind the shields that was reportedly up to 240 feet long (Drawing 1). Reportedly, the crack was most prominent at shields 106-107, just to the tailgate side of mid-face. The fracture was aligned parallel to the face, and occurred within approximately three crosscuts of where the longwall face was planned to cease extraction in this panel. Bottom heave was reported at the face, tilting the longwall shearer away from the face toward the shields. At the time of the outburst, the employees were said to have heard a "big thump" that they associated with the sound that the overlying sandstone usually emits upon failure. Both before and after the outburst, it was noticed that the shields were taking weight and yielding. Employees working in the Headgate 18 section, on the opposite side of the subsequent longwall panel from the outburst area, reported that they heard a thump. The shearer had been down for about 20 minutes preceding the event, thus the face was idle. The outburst occurred at 11:40 Wednesday morning and the longwall face resumed production on Friday evening.

A similar, but apparently higher pressure floor burst occurred in the previously mined adjacent panel in July 2003 at approximately 49 Crosscut. Mine personnel reported that this outburst event was also associated with formation of a floor crack that was parallel to the face and in the approximate center of the face behind the shields. Mine personnel described the July 2003 outburst as a very high pressure event, comparable to the sound of a jet engine. Mine personnel indicated that, although accompanied by a high level of noise and rapidly rising methane levels, coal outbursts or coal ejections were not associated with the events. It was reported that the Harris Mine, also in the Eagle seam adjacent to the Upper Big Branch Mine, has experienced similar floor bursts.

The Upper Big Branch Mine is developed in the Eagle coal seam, which is overlain in different areas by up to six mined coal seams. The Powellton seam is 170 feet above, the Cedar Grove is 430 feet above, the Hernshaw is 640 feet above, the Winifrede is 720 feet above, the Coalburg is 820 feet above, and the Five Block is 1075 feet above the Eagle seam. The Lower Eagle seam, which ranges in thickness from approximately 12 inches to 2 feet, lies variably from 5 to 25 feet below the Eagle seam and has not been mined. Maximum overburden thickness on the Eagle seam is just over 1200 feet and ranged from -1000 to 1200+ above the two floor burst locations. The interburden between the Eagle and Lower Eagle seams at both floor burst locations was 12 to 13 feet. Based on observation of overlay maps, it appears that only mine workings in the Powellton, Cedar Grove, Hernshaw, and Winifrede seams occur above the Upper Big Branch Mine. A barrier-to-pillared transition area in the Powellton seam occurs directly over the area of the recent floor burst on the Headgate 17 Panel, as does a room-and-pillar working in the Winifrede seam. It was reported that the longwall had been struggling with difficult roof conditions prior to the outburst, possibly due to this barrier in the Powellton seam above.

The mine has constructed a series of contour maps that portray the overburden thickness above the Eagle seam, the interburden thickness between the Eagle and Lower Eagle seams, the structure contours on top of the Lower Eagle seam, and the thickness of the Eagle seam. The mine interprets the major controlling factors on floor burst events as an interaction between high overburden (1100 feet) combined with a thin interval between the Eagle and Lower Eagle seams (<13 feet).

Observations

Observations began in Headgate 17 opposite the longwall face, at approximately 38 Crosscut. Observations were conducted to evaluate the possible effects of an overlying barrier/gob boundary that is located in the Powellton seam. The roof of the #2 Entry was composed of gray shale that hosted extensive carbonized plant debris and exhibited significant delamination adjacent to and behind the longwall face position. Observation through the open crosscuts indicated that the roof had caved behind the longwall shields, including #3 Entry and portions of the crosscut between Entries 2

and 3. It appeared that the proximity of the longwall face exerted more influence on roof conditions than the overlying barrier/gob boundary in the Powellton. Any observable effects of the barrier/gob boundary were subtle. Observations proceeded to approximately 44 Crosscut/#1 Entry to include the transition beneath both barrier pillars and the pillared gob in the Powellton. Although there were variations in the degree of rib sloughing and roof degradation, there was not a marked change that could be clearly associated with overmining. A series of irregular slickensides were observed in the #1 Entry traverse and appeared to be of the compaction style.

Observations resumed in Headgate 18 in the #3 Entry/26 Crosscut intersection. The traverse proceeded up the #4 Entry to document any geological structures that might project from the floor burst locations. Between 36-41 Crosscuts, a series of prominent slickensides were observed, although the remainder of the traverse was characterized by very regular, undisturbed roof and ribs. The slickensides were consistently oriented along a bearing of between N 25-55° W and were mainly concentrated between 36-39 Crosscuts. The bearing of the slickenside zone projects through the July 2003 floor burst area that occurred in the Headgate 16 Panel. The February 2004 floor burst location is approximately 500 feet northeast of the line that connects the Headgate 18 slickenside zone and the July 2003 floor burst location (Drawing 1). Observations continued in the #4 Entry to 45 Crosscut and then returned down the #3 Entry to document the continuity of the observed slickenside zone.

Observations in Headgate 18 resumed in 65 Crosscut where two four-entry gate roads bounding a mined-out longwall panel are located in the overlying Powellton seam. Observations proceeded from 65 Crosscut to 80 Crosscut to document the transition from barrier to gob and back to barrier beneath the mined-out longwall panel. Only very slight differences in rib conditions were observed. Rib sloughing was very slight along the entire 65-80 Crosscut interval, and ribs were very straight with sharp corners. A slightly higher degree of rib sloughing was present outby the overmined area beneath approximately 1100 feet of overburden. This suggests that, at least before longwall extraction causes redistribution of stress, overburden exerts more influence on rib condition than overmining.

Discussion and Conclusions

Several factors may have influenced the two floor bursts that occurred in July 2003 and February 2004. These factors include: (1) critical overburden value of 1100+ feet; (2) critical Eagle/Lower Eagle interburden thickness of 12 feet; (3) location of barrier pillars in the overlying Powellton seam; and (4) projected zone of geologic weakness.

Both outbursts occurred in areas that are characterized by 1100-1200 feet of overburden in combination with an interburden thickness between the Eagle and Lower Eagle seams of 12-13 feet and a thickness of the Lower Eagle seam of 1.25-1.5 feet. Although

the February 2004 outburst site is located directly beneath a barrier pillar in the overlying Powellton seam, the site of the July 2003 outburst is located beneath a room-and-pillar section that is not indicated on mine maps to have been pillared. Additionally, observations of roof and rib conditions in Headgate 17 and 18 indicated that the influence of overmining is not readily recognized. Thus, although abutment stress associated with overmining may represent some influence, perhaps in conjunction with other factors, it is not clear that overmining is the most significant influence. If there is any influence of overlying barrier pillars in the Powellton seam, it appears to be slight and may be only manifested during longwall extraction as stress is redistributed during gob caving. Mine management stated that increased pressures were often experienced while longwall mining beneath barrier blocks in the overlying Powellton seam.

One of the interesting aspects of the fractures that developed in the floor appears to be their parallel nature to the longwall face. Mine personnel also reported that shield pressures increased dramatically in the center of the face concurrent with fracture formation and methane release. Furthermore, the shields that experienced dramatically increased pressure were approximately coincident with the extent of the subsequently formed floor fracture. Mine personnel reported that the fracture formed behind the shields. This may suggest that the position of the shield line, in conjunction with high overburden and thin interburden, may have significantly influenced the formation of floor fractures. It appears that the roof weighting was being transferred through the shields to the mine floor and may have produced the shearing force that fractured the interburden between the two coal seams.

Another factor that may have influenced the formation of the floor fractures is represented by the zone of sub-parallel slickensides observed in the 36-39 Crosscut area in Headgate 18. Although by themselves the individual slickensides appear to be minor features, their occurrence within a restricted zone that projects through the location of the July 2003 floor burst site may be more than mere coincidence. The zone of slickensides could represent a subtle fault zone that is simply not expressed in the Eagle coal seam. Similarly, the slickensides might represent a change in lithology from sandstone to shale. In either case, the zone of geologic discontinuity could represent a dismembered block of rock that could have formed a cantilever effect onto the shields. In combination with high overburden and thin interburden, the cantilevered body of rock might then act as a platen on the shields, transmitting sufficient stress to fracture the floor. A similar situation is believed to have caused three pillars to burst in a coal bump at a Western longwall mine; the pillars were adjacent to a subtle fault zone that did not offset the coal, but did apparently dismember the roof beam, possibly allowing the hard sandstone roof to cantilever onto the pillars. Mine maps indicated that a lineament projects directly through the site of the February 2004 floor burst location, although no evidence of this lineament was found during the underground

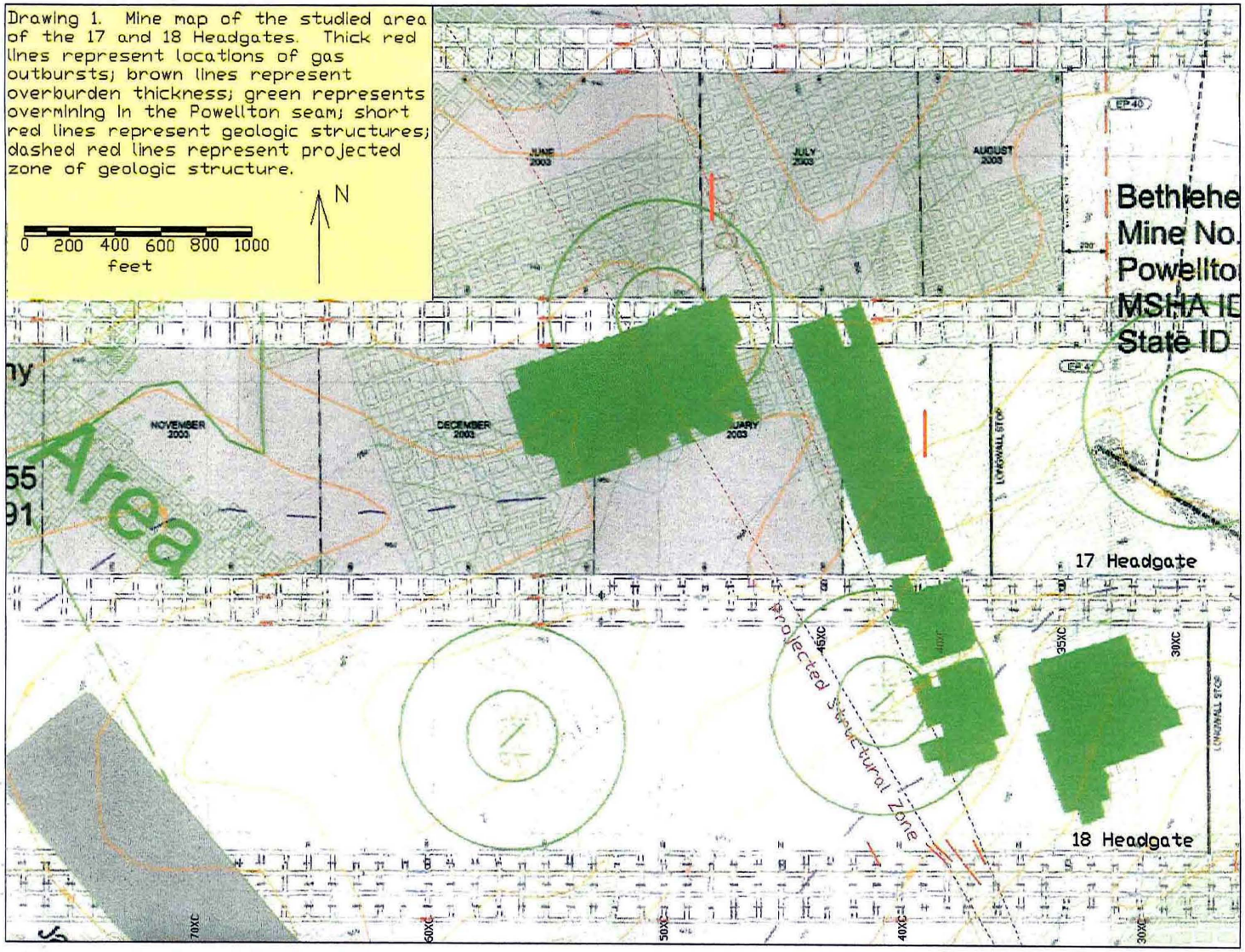
observations. However, lineaments commonly do not project vertically with depth, but instead may represent inclined fault or fracture zones, so that observations directly beneath the projected lineament might not reveal parallel geologic structures.

The reportedly extreme high-pressure outflow of the gas during the outbursts does not seem consistent with a usual occurrence of methane bleed-off from a thin coal seam. Although it has been assumed that the source of the methane is from the underlying Lower Eagle seam, it should be considered that the Lower Eagle seam may simply represent an impermeable caprock for a larger gas trap. Natural gas may be ponded in structural highs beneath the Lower Eagle seam, after rising into domes and subsequently being trapped from further rise by relatively impermeable coal or shale. Seam elevation contours on the Lower Eagle seam indicate that there is a local structural high area that trends northeast through the Longwall Stop-line of the current, Headgate 17 Panel. There is not a well defined structural high beneath the site of the July 2003 floor burst, although the contours indicate that this site is above the rising flank of the same localized structural high as the February 2004 event. It should also be noted that since the Lower Eagle seam has not been mined, seam elevation data is most likely limited to drill core and well logs. The spacing of these holes may not be sensitive to rises in the elevation of the Lower Eagle seam that could form domes, which could be acting as reservoirs for methane gas.

Mine personnel indicated that degasification wells are planned for the next longwall panel in an effort to bleed off any gas prior to encroachment of the longwall face. This appears to be a reasonable plan to reduce the future occurrences of floor bursts, but will not mitigate the floor fracturing that may be due to the other controls discussed. In order to more efficiently direct the placement of degasification wells, it could be beneficial to construct a hazard map, based on superimposing areas with 1,100 feet or more of overburden, less than 13 feet of interburden between the Eagle and Lower Eagle seams, the projected structural zone identified in Headgate 18, and overmined areas. Correlating these areas with the floor bursts that have occurred in the mine may reveal possible problem areas or the areas best suited for methane drainage holes.

If you should have any questions regarding this report or if we can be of further assistance, please contact John Cook at 304-547-2313 or Sandin Phillipson at 304-547-2015.

Attachment


Drawing 1. Mine map of the studied area of the 17 and 18 Headgates. Thick red lines represent locations of gas outbursts; brown lines represent overburden thickness; green represents overmining in the Powellton seam; short red lines represent geologic structures; dashed red lines represent projected zone of geologic structure.
0 200 400 600 800 1000
feet
N
JUNE 2003
JULY 2003
AUGUST 2003
NOVEMBER 2003
DECEMBER 2003
JUARY 2003
Bethlehe
Mine No.
Powellto
MSHA ID
State ID
17 Headgate
18 Headgate
Projected Structural Zone
70XC
60XC
50XC
40XC
30XC
45XC
35XC
LONGWALL STOP

U.S. Department of Labor

Mine Safety and Health Administration
Pittsburgh Safety & Health Technology Center
P.O. Box 18233
Pittsburgh, PA 15236

Ventilation Division

JUL 15 2004

MEMORANDUM FOR STEPHEN J. GIGLIOTTI [redacted]
Acting District Manager, Coal Mine Safety and Health,
District 4

[redacted]

THROUGH: EDWARD J. MILLER
Chief, Pittsburgh Safety and Health Technology Center

[redacted]

JOHN UROSEK
Chief, Ventilation Division

[redacted]

M. TERRY HOCH
Chief, Roof Control Division

[redacted]

FROM: GEORGE AUL
Mining Engineer, Ventilation Division

[redacted]

MICHAEL GAUNA
Mining Engineer, Roof Control Division

SUBJECT: Methane Floor Outbursts at Performance Coal Company's Upper Big Branch Mine - South, MSHA I.D. 46-08436

Summary

On May 4, 2004, Acting District Manager, Coal Mine Safety and Health (CMS&H), District 4, requested assistance for controlling gas emissions from floor outbursts at Performance Coal Company's Upper Big Branch Mine. On May 26, 2004, a meeting was held at the mine site to share information with Performance Coal Company personnel pertaining to floor methane outbursts encountered in other Appalachian coal seams. Those in attendance are listed in Appendix A.

The Performance Coal Company operates the Upper Big Branch Mine located near Whitesville, West Virginia. Coal was extracted from the Eagle Coal Seam using both continuous mining machine and longwall mining methods. The mine has encountered floor outburst problems associated with longwall retreat mining.

In the Pocahontas No. 3 coal field, floor outbursts were determined to be associated with methane trapped in fracture zones below the coal seams. Methane was released from the underlying fracture system(s) through the stressing and/or stress relief of the underlying strata from the longwall panel extraction. Experience suggests that locating and degassing floor methane zones through a drilling program was highly problematic. Consequently, because of the uncertainties with floor methane outbursts, the historical means for handling the situation relies on contingency plans to mitigate such an event. Items to consider include increased air quantities along the longwall face and in the bleeder system, training, safety procedures, ground condition monitoring, mitigation plans, and gas sampling.

Background

The Upper Big Branch mine experienced a floor methane outburst in February 2004 on the 17 Longwall panel. Previously, a similar floor methane outburst occurred in the adjacent 16 Longwall panel in July, 2003. It was reported that the Harris Mine, also in the Eagle seam adjacent to the Upper Big Branch mine, has experienced similar events on longwall panels. As requested by CMS&H, District 4, information was shared with Performance Coal Company personnel pertaining to floor gas outbursts encountered in other Appalachian coal seams.

Discussion

The floor methane outbursts encountered at the Upper Big Branch Mine have a stratigraphic similarity with outbursts encountered in the Pocahontas No. 3 Coal Seam in Virginia. In the areas that the outbursts occurred, the mined coal seam is near the base of the existing coal series in the region. The Eagle coal seam is the lowest mineable coal seam at the base of the Kanawha Formation. The stratigraphically lower New River Formation containing the Beckley coal series and the underlying Pocahontas Formation containing the Pocahontas coal seams do not exist.

In the Pocahontas No. 3 Coal Seam, the floor methane outbursts were determined to be associated with gas trapped in reservoirs deep below the coal seam. Methane was released from the underlying fracture system(s) through the stressing and/or stress relief of the underlying strata from the longwall panel extraction. The gas from under the Pocahontas No. 3 seam possessed a different composition than the gas associated with coal bed methane, indicating a non-coal bed, deeper source for the gas. It is

suggested that a similar mechanism could account for the Upper Big Branch mine outbursts. This mechanism is considered likely since the outbursts do not occur during section development and only are associated with longwall panel extraction.

Gas reserves exist below the coal seam in the Upper Big Branch mine area. Numerous gas wells are present on the property which reportedly target gas sands situated approximately 2,500 feet below the Eagle coal seam. Consequently, methane trapped in zones below the Eagle Coal Seam could be released into the mine through fractures opened by longwall coal extraction. Gas analyses of the Eagle coal seam gas and the floor gas have not been completed. A comparison of the hydrocarbon content of the two gases may reveal the source of the gas.

Considerations

Locating and degassing floor methane zones through a drilling program is highly problematic. The fracture zones are not visible underground and their position can only be ascertained as generalized trends. The locations of the gas zones are revealed by methane released from fractures produced by disturbance of the extracted longwall. Gas well stimulation programs may not be effective if the well is not located in the exact area of the gas zone.

Consequently, the historical means for handling the situation relies on contingency plans to mitigate such an event. Items for consideration include:

1) Increased longwall face airflow will more effectively dilute the methane released from the outburst closer to the source and safely remove it from the face area. Increasing airflow after an event does not address the condition when the hazard potential was greatest.

2) Provide adequate ventilation in the longwall bleeder system. A floor gas outburst can occur in the caved zone behind the longwall shields. Increased airflow in the bleeder system would be more effective in diluting additional gas released by the outburst. Airflow in the bleeder entries can be improved by removing restrictions, such as water. Bleeder system performance is paramount for providing adequate dilution of gob gases, especially near the active areas.

3) Be aware of the conditions associated with the occurrence of an outburst, such as approximate panel position. Insure that all crews recognize that mining has advanced into a zone with a potential for a floor outburst. Consider developing a plan to outline procedures to manage the sudden release of gas from the floor outburst. Insure that all crews understand the plan especially with regards to personnel restrictions and removal of electrical power.

4) Use any precursors such as rapidly yielding shield legs or unusual noises to indicate that a floor outburst may be initiating. Monitor shield leg pressures in outburst prone areas so the longwall crew can be rapidly removed from the face.

5) The floor outburst zone appears to be in close proximity to future longwall stop positions. Consequently, ventilation requirements and examinations during longwall recovery operations in areas susceptible to floor outbursts could be critical. Normally, longwall recovery operations are accomplished with reduced airflow, because the minimal mining alleviates methane problems. Longwall face airflow similar to that used for mining may be required during recovery.

6) Consider restricting cutting and welding activities in areas that have a high probability of floor gas outburst occurrence. If this type of work must be conducted, special precautions should be applied. Listed below are some procedures develop by other mining companies that have experienced similar problems:

- A diligent effort should be applied while checking for methane. Gas tests taken more often and closer than 1 foot from the floor may be useful in detecting gas emissions from small fractures in the floor.

- Gas checks should be taken underneath the pan line where methane may accumulate. Raising the pan line allows better access for testing and permits airflow to dilute accumulations of methane.

- Fire extinguishers, water, and rock dust should be at the work site.

- A welding mat or blanket may be used to catch hot material to prevent it from coming in contact with a methane feeder. After the work is completed, the hot material should be cooled and removed from the face area.

7) Consider developing a plan for sealing the fractures after the outburst occurs. Chemical grouts that are reactive with water may be poured or injected into the fracture to help slow the flow of gas. Store additional supplies near the longwall face so that they are readily available.

8) Should a methane outburst occur, it would be beneficial to sample the gas and immediately conduct an analysis for the higher order hydrocarbons. This gas chemistry should be compared to the composition of the Eagle seam(s) methane to determine if the gas is similar or dissimilar. The gas chemistry could determine if the source is coal bed methane or another methane source. A means for collecting gas would involve drilling a hole in the pillar rib in the face area and immediately installing a glue injection packer fitted with a closed valve. Coal bed gas could be accumulated in the hole and be collected for analysis.

If you should have any questions regarding this report, or if we can be of further assistance, please contact George Aul at (304) 547-2318 or Mike Gauna at (304) 547-2311.

Appendix A

Personnel Who Attended May 26 Meeting

MSHA Personnel

George Aul, Mining Engineer, PSHTC, Technical Support
Michael Gauna, Mining Engineer, PSHTC, Technical Support
Don Winston, Mining Engineer, CMS&H, District 4

Performance Coal Company Personnel

Tim Comer, President, New River Energy Corporation
George Levo, Senior Mining Engineer, Performance Coal Company
Mike Milam, Performance Coal Company, Upper Big Branch Mine
Bill Potter, Performance Coal Company, Upper Big Branch Mine

cc: ROOF(M. Guana)
Roof Control Files
VENT(G. Aul)
(D. Beiter)
(R. Stoltz)
Vent Files-SUB-D75

MSHA:TS:GAul:06/23/04:TRI:B2:304-547-2318:T\Pghvent/ghU big branch vent_1.doc

Appendix N – Comparison of Belt Inspections and Examination Records

Belt Conveyor Inspected	Date Inspected	Accumulations Reported During Exam	Other Hazards Reported During Exam	Corrective Actions Reported	75.400 Cited	Other Hazards Cited	Failure to Take Corrective Action Cited	Comments
#1 North	12/9/2009	Yes	No	No	No	Yes	No	Fire deluge system cited under 75.1101-1. Belt reported as needing cleaned or dusted in various areas for 11 shifts prior to inspection.
1 South Belt	12/9/2009	Yes	No	No	No	No	No	Belt reported as needing cleaned or dusted in various areas for 11 shifts prior to inspection.
4 Section, #1 Belt	12/10/2009	No	No	No	No	No	No	
4 Section, #2 Belt	12/10/2009	No	No	No	No	No	No	
3 Section, #1 Belt	12/23/2009	Yes	No	No	No	No	No	Belt reported as needing cleaned and dusted in places for 8 shifts prior to inspection.
1 Section, #2 Belt	1/7/2010	No	No	No	No	No	No	Reported idle from 12/28/09 thru 1/7/10.
1 South Belt	1/11/2010	Yes	Yes	No	No	Yes	No	Issued two 75.1731(a) violations, including a 104(d)(2) order, and two 75.1731(b) citations. Inspector's notes and the 75.1731(a) order indicated combustible material was present on the belt yet no 75.400 violation was cited. Belt reported as needing dusting in places.
#4 Ellis Belt	1/19/2010	Yes	No	No	No	No	No	Belt reported as needing dusted for 9 shifts prior to inspection.
#5 Ellis Belt	1/19/2010	Yes	No	No	Yes	Yes	No	Belt reported as needing dusted for 9 shifts prior to MSHA inspection, no corrective actions recorded. The inspector issued 2 section 104(a) citations for these violations of 30 CFR 75.400, with the operator's negligence evaluated as moderate. The inspector also cited 2 areas for violations of 75.1731(a). Did not cite failure to take corrective actions.
#4 North Mains	1/19/2010	Yes	No	No	No	Yes	No	Belt head and take-up reported needing dusted for three shifts prior to inspection, no corrective actions recorded. 75.202(a) cited for hazardous rib condition.
3 Section, #1 Belt	1/20/2010	Yes	No	Yes	No	Yes	No	Inspector cited violations of 75.1100-2(b) for fire valve spacing and 75.1731(b) for belt rubbing against structure. Exam records show accumulations reported for days, but corrective actions started during shift prior to inspection, and continued that day.
#5 North Mains	1/26/2010	Yes	No	Yes	No	No	No	Belt reported as needing cleaned and dusted in various areas for 10 shifts before inspection, no corrective actions recorded until shift before the inspection, when it was dusted. Additional cleaning needed at tail for 2 shifts after inspection.
#6 North Mains	1/26/2010	Yes	No	No	No	No	No	Belt reported as needing cleaned and dusted in various areas for 8 shifts prior to inspection.
#7 North Mains	1/26/2010	Yes	No	No	No	No	No	Belt reported as needing additional dusting 2 shifts prior to inspection.
1 South Belt	1/26/2010	No	No	No	No	Yes	No	Cited 75.1722(b) violation at tailpiece.
1 Section, #1 Belt	1/28/2010	Yes	No	No	Yes	No	No	Notes indicate inspector thought condition existed for several shifts and examiner knew, but contained no facts to support it. Did not check belt exam book, which showed violation for 4 days and numerous other times. The inspector issued a section 104(a) citation for the violation of 30 CFR 75.400, with the operator's negligence evaluated as moderate. Some exam reports describe the extent as entire length of belt, which matches condition cited.
3 Section, #2 Belt	2/11/2010	No	No	No	No	No	No	
#1 North	2/22/2010	Yes	Yes	No	No	No	No	Belt reported as needing additional dusting and wire mesh installed on day of inspection.

Belt Conveyor Inspected	Date Inspected	Accumulations Reported During Exam	Other Hazards Reported During Exam	Corrective Actions Reported	30 CFR 75.400 Violation Cited	Other Hazards Cited	Failure to Take Corrective Action Cited	Comments
#2 North	2/22/2010	Yes	No	No	No	No	No	Belt reported as needing dusted in places for two shifts prior to inspection. Same conditions continue to be recorded for several shifts after inspection with no corrective actions.
4 Section (Barrier)	2/22/2010	No	No	No	No	No	No	Belt is idle due to section being moved.
1 Section, #1 Belt	3/9/2010	Yes	No	No	Yes	No	No	Exam records show the belt needing cleaned and dusted every shift for entire book, back to 3-1-2010. The inspector issued a section 104(a) citation for the violation of 30 CFR 75.400, with the operator's negligence evaluated as moderate.
1 Section, #1 Belt	3/15/2010	Yes	No	No	Yes	Yes	No	Exam records show the belt needing cleaned and dusted every shift for entire book, back to 3-1-2010. The inspector issued a section 104(a) citation for the violation of 30 CFR 75.400, with the operator's negligence evaluated as moderate.
2 Section, #1 Belt	3/15/2010	Yes	No	No	No	Yes	No	Belt reported as needing cleaned and dusted in places for 3 shifts prior to inspection.
Longwall Belt	3/15/2010	Yes	Yes	No	Yes	Yes	No	Records state "Need spot cleaned & dusted" for 11 shifts prior to inspection. The inspector issued 2 section 104(a) citations for these violations of 30 CFR 75.400, with the operator's negligence evaluated as moderate. A section 104(b) order was issued on 3/24/2010 for failure to abate one of these violations.
#5 North Mains	3/15/2010	Yes	No	No	Yes	No	No	Records consistently report cited condition since book was started on 3/1/2010. The inspector issued a section 104(a) citation for the violation of 30 CFR 75.400, with the operator's negligence evaluated as moderate.

Appendix O– Enforcement of Respirable Dust Standards

The exposure to excessive concentrations of respirable coal mine dust poses significant health risks to miners, including the risk of developing lung disease. The risk that miners will develop lung disease depends on the quantity – the concentration and duration – of the dust inhaled. The risk rises as the percentage of quartz in respirable dust increases. Black lung refers to a number of lung diseases caused by inhalation of coal mine dust, including coal workers' pneumoconiosis (CWP), emphysema, and chronic bronchitis.

Compliance with respirable dust standards is based initially on determining the minimum dust control parameters that effectively can control respirable dust. Reliably and consistently keeping exposures below applicable limits depends on an operator maintaining these minimum parameters.

After the explosion at UBB, the State of West Virginia, Department of Health and Human Services, Office of the Chief Medical Examiner performed autopsies on the 29 victims.[74] These autopsies indicated that most of the victims had evidence of varying degrees of black lung in the form of CWP, emphysema, and fibrosis.

The average age of the victims was 44 years, and the average mining experience was approximately 19 years. The majority of the victims (58.6%) had more than 10 years of mining experience and most (65.5%) worked less than 5 years at UBB. Employment history indicated four of the victims worked only at UBB during their mining careers.

Due to evidence of dust-related lung disease identified from autopsies of the victims, the Internal Review team reviewed District 4's enforcement of the respirable dust standards in 30 CFR Part 70. Accordingly, the Internal Review team examined UBB respirable dust-related records provided by District 4 for the review period. These records included: methane and dust control plans (MMU plans); plan supplements; inspection reports; and results of respirable dust sampling conducted by District 4 for plan evaluation and by the Operator for compliance with mandatory health standards. Also included were copies of citations and orders issued for failing to collect samples, respirable dust overexposures, and deviations from approved plans related to respirable dust control. The team also considered pertinent information from previous years in order to address historical factors related to respirable dust at UBB. The Internal Review team interviewed MSHA employees to determine whether enforcement of respirable dust standards at UBB conformed to the provisions of the Mine Act and MSHA regulations, policies, and procedures.

In addition to deficiencies in MSHA's enforcement of respirable dust standards at UBB, the Internal Review team found serious failures on the part of the Operator to adequately protect UBB miners from excessive respirable dust exposures. Evidence indicates miners were exposed to respirable dust concentrations in excess of reduced standards, which are associated with high quartz concentrations, for many months on the working sections.

Requirements: Mandatory health standards were contained in 30 CFR Part 70. In addition, 30 CFR Part 75 contained health-related provisions, such as ventilation plan requirements and specific respirable dust standards when using air from the belt entry to ventilate working sections.

Mandatory health standards under 30 CFR Part 70 required underground coal mine operators to collect respirable dust samples on a bimonthly basis and submit them to MSHA for analysis to determine compliance with applicable standards. Compliance determinations were based on the average concentration of respirable dust measured by five valid samples taken by the mine operator during five consecutive normal production shifts or five normal production shifts worked on consecutive days. The standards required sampling with at least 50% of the average production. MSHA directed enforcement personnel to issue a citation or order when compliance samples did not meet the requirements of the applicable dust standard.

[74] Report of MSHA Accident Investigation, December 6, 2011.

Mandatory health standard 30 CFR 70.100(a) stated: "Each operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings of each mine is exposed at or below 2.0 milligrams of respirable dust per cubic meter [2.0 mg/m^3] of air."

Mandatory health standard 30 CFR 70.101 stated: "When the respirable dust in the mine atmosphere of the active workings contains more than 5 percent quartz, the operator shall continuously maintain the average concentration of respirable dust in the mine atmosphere during each shift to which each miner in the active workings is exposed at or below a concentration of respirable dust, expressed in milligrams per cubic meter of air… computed by dividing the percent of quartz into the number 10." For example, when respirable dust associated with an MMU contains 20% quartz, the applicable dust standard is reduced from 2.0 to 0.5 mg/m^3 (10/20 = 0.5).

Mandatory health standard 30 CFR 70.201(d) stated: "During the time for abatement fixed in a citation for violation of §70.100 (Respirable dust standards) or §70.101 (Respirable dust standard when quartz is present), the operator shall take corrective action to lower the concentration of respirable dust to within the permissible concentration and then sample each production shift until five valid respirable dust samples are taken."

Mandatory health standard 30 CFR 70.207(a) stated in part: "Each operator shall take five valid respirable dust samples from the designated occupation in each mechanized mining unit during each bimonthly period…." Subparagraph (f)(1) stated: "Each mechanized mining unit will be assigned a four digit identification number by MSHA. The mechanized mining unit shall retain that identification number regardless of where the unit relocates within the mine."

Mandatory health standard 30 CFR 70.208(f) stated: "MSHA approval of the operator's ventilation system and methane and dust control plan may be revoked based on samples taken by MSHA or in accordance with this part 70."

Mandatory health standard 30 CFR 70.220(a) stated: "If there is a change in operational status that affects the respirable dust sampling requirements of this part, the operator shall report the change in operational status of the mine, mechanized mining unit, or designated area to the MSHA District Office or to any other MSHA office designated by the District Manager. Status changes shall be reported in writing within 3 working days after the status change has occurred."

Mandatory safety standard 30 CFR 75.350(b)(3)(iii) required that when the air from the belt air course is used to ventilate a working section: "A permanent designated area (DA) for dust measurements must be established at a point no greater than 50 feet upwind from the section loading point in the belt entry when the belt air flows over the loading point or no greater than 50 feet upwind from the point where belt air is mixed with air from another intake air course near the loading point. The DA must be specified and approved in the ventilation plan."

Mandatory safety standard 30 CFR 75.371(t) required that the mine ventilation plan include: "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."

MSHA Policies and Procedures: The *Program Policy Manual* provided enforcement guidance for the following mandatory health standards as follows:

- Under 30 CFR 70.201(d): "When the operator does not take corrective action to reduce the concentration of dust before taking samples, and the sampling results show continuing noncompliance, the inspector shall not extend the time for abatement of the violation and shall issue the appropriate order."
- Under 30 CFR 70.207(a): "Although this provision does not set forth exactly when during the bimonthly period, the required sampling should be conducted, it is to the operator's advantage to conduct sampling during the first month of each bimonthly period because it would provide an opportunity to collect replacement samples if any sample is voided."

- Under 30 CFR 70.207(f)(1): "The MMU identification number will remain the same when individual pieces of equipment within that unit are replaced. The only time the MMU number sequence at a mine will change is when an existing unit of equipment is permanently removed from the mine or a new (or different) unit is placed in a mine."
- Under Section I.103-4, Respirable Dust Sampling at Underground Coal Mines:

  > MSHA does not take respirable dust samples during each of the four annual coal mine underground inspections. Instead, in line with the understanding between MSHA and the General Accounting Office, MSHA began in September 1975 to emphasize proper respirable dust control measures at underground coal mines. Each coal mine operator develops plans for monitoring compliance with the 2.0 milligram or lower standard. MSHA reviews and tests the operator's respirable dust control plan by taking samples. Once the plan is approved, inspectors measure the engineering parameters during each inspection to assure that all of the plan's elements are followed. If the plan is not being followed, the appropriate citation/order is issued.

Chapter 1 of the *Coal Mine Health Inspection Procedures Handbook,* PH 89-V-1 (rev. 2008), established procedures and guidelines for conducting respirable dust sampling inspections, evaluating sampling results, establishing and removing sampling entities, establishing reduced dust standards due to quartz, and monitoring the operators' respirable dust control and sampling programs. It provided enforcement personnel the following direction:

> The District Manager must be able to reliably ascertain whether the approved ventilation plan's minimum control parameters (e.g., air quantity, number of sprays, water pressure, etc.) allow for effective and consistent control of respirable dust and methane. Data based on samples collected when control parameters significantly exceeded the ventilation plan minimums (and/or when production is significantly below normal levels) cannot reasonably or reliably serve as the basis for justifying the continued approval of a ventilation plan.

While operator samples were used to determine compliance with respirable dust standards, MSHA sampling was conducted to determine continued adequacy of the dust control parameters approved in the mine ventilation plan. As part of this function, the Handbook directed inspectors to sample all underground entities on a quarterly basis, including each producing MMU. MSHA determined plan adequacy by measuring parameters and collecting gravimetric samples to determine if the parameters can attain compliance based on the average of five samples collected by inspectors. This could be the average of five different occupations sampled concurrently on an MMU or the average of up to five samples taken on one occupation over a period of time. MSHA directed enforcement personnel to issue a citation or order when compliance samples do not meet the requirements of the applicable dust standard.

After an inspector collects respirable coal mine dust samples and monitors the mine operator's dust control parameters, the inspector was directed to complete a "Respirable Dust Sampling and Monitoring Data" form (MSHA Form 2000-86). The Handbook provided detailed instructions for completing the form, including direction for inspectors to complete a separate form for each producing MMU and shift that the inspector visits during one of these activities. During these inspections or investigations, inspectors were required to evaluate and record the respirable dust controls in use.

On sections mining extended cuts while using flooded-bed scrubbers, parameter checks were to include Pitot tube measurements to determine the operating volume of the scrubbers. Inspectors were to conduct a full Pitot tube traverse at least every other quarter, while a centerline measurement can be made on non-measurement inspections.

To establish a reduced respirable dust standard at an underground mine, MSHA respirable dust samples meeting certain criteria were analyzed for quartz. Depending on the quartz concentration of the MSHA samples, the mine operator may be notified of the option to collect a respirable dust sample from the affected area or occupation to verify the quartz content. In certain cases, the operator will be afforded the opportunity to collect and submit a second optional sample. As a result, the reduced standard will be

based on either: the average quartz content of the MSHA and operator's optional sample(s); the average of the MSHA and operator's highest quartz content; or the quartz content of the MSHA sample alone. When MSHA collects respirable dust samples from entities already on a reduced dust standard, the applicable standard will be adjusted using this same procedure. Every six months, MSHA automatically reevaluated the reduced standard by analyzing operator's samples.

A reduced standard, as well as any citation issued for exceeding the reduced standard, remained with an MMU when it moved to a new location. The Handbook also directed districts to complete an MMU/DA/DWP Data form (MSHA Form 2000-142, revised October 1985) for manual data entry when assigning new MMUs or updating existing MMUs. The Handbook included instructions for completing the form, indicating that the applicable respirable dust standard [Item 7C] can be set at the time of entry into the computer system.

When belt air is used to ventilate a working section, a DA shall be established in accordance with 30 CFR 75.350(b)(3). When a new DA is to be established, the District Manager must (1) notify the mine operator in writing, (2) identify the date that bimonthly sampling will begin for the newly established entity, and (3) require that the mine operator submit a short addendum to the approved ventilation plan showing the location of the new DA to be sampled bimonthly, the position of the sampling unit within the DA, and the type of dust controls that are to be maintained.

The *General Coal Mine Inspection Procedures and Inspection Tracking System* Handbook directed that, during each regular inspection, "Dust controls used on the section shall be inspected to determine compliance with applicable standards and the approved mine ventilation plan."

The *Citation and Order Writing Handbook for Coal Mines and Metal and Nonmetal Mines, PH08-I-1*, stated "Inspectors shall give primary consideration to the health and safety of miners in establishing abatement times for all citations. [Emphasis on original] The termination time for a citation must be specific and provide a reasonable time for mine operators to abate the conditions, practices, or circumstances which caused issuance of the citation. Citation abatement times shall not be established for the convenience of the mine operator, or for the inspector…." [Emphasis on original]

Program Information Bulletin (PIB), P09-31, Operator Respirable Dust Sampling Requirements stated "Submitting either voided or invalid samples will not satisfy the bimonthly sampling requirements. Therefore, it may be necessary for an operator to collect and submit additional samples during a bimonthly period. Failure to take the required number of valid respirable dust samples within a bimonthly period would constitute a violation. For this reason, it is to the operator's advantage to collect and submit the required number of samples early in the bimonthly period. This would allow ample opportunity for the collection and submission of additional samples if necessary."

Continuous Mining Machine Sections

Statement of Facts: With one exception, the Operator provided written notification to District 4 when there was a change in operating status for the continuous mining machine units at UBB. On March 16, 2010, the Operator received a section 104(a) citation under 30 CFR 70.220(a) for failing to notify the District that the 040-0 MMU had been activated after an idle period.

The District 4 Health Department standard operating procedure (SOP) for MMU plan review and approval, dated October 14, 2009, specified the acceptable provisions, methane and dust control parameters, and safety precautions for recommending plans and supplements for approval by the District 4 Manager. These criteria were included as minimum requirements on plan approval checklists for the specialists' use when reviewing such plans.

The Health Department SOP also required that the extraction equipment (continuous mining machine or longwall shearer) for each MMU be listed in the plan by manufacturer, model, and serial number. Since some of the older MMU plans and supplements had been approved using previous District 4 SOPs, not all of the plans included the serial numbers as required by the latest SOP. Therefore, tracking the movement of these mining machines between the various sections at UBB was very difficult.

District 4 routinely approved new MMU plans, submitted by the Operator, which specified a line curtain setback of 20 feet or less. When activated, District 4 assigned the newly approved MMU a respirable dust standard of 2.0 mg/m^3. Inspectors or specialists evaluated the methane and dust control parameters outlined in each plan or supplement after the MMU started producing coal.

At UBB, it was common practice for the Operator to deactivate an MMU operating under a reduced standard and activate another previously approved MMU to mine in the same physical location. District 4 did not apply the reduced standard of the previous MMU to the new MMU. This occurred on eight occasions during the review period. In six of these instances, the Operator replaced an MMU after the first set of MSHA respirable dust samples resulted in a reduced standard; the other two were replaced after the second set of samples resulted in a reduced standard.

District 4 allowed sets of mining equipment on working sections to be assigned new MMU identification numbers even though the Operator replaced only one piece of equipment, the continuous mining machine. By deactivating an existing MMU and replacing it with another MMU in this manner, the Operator was able to: (1) avoid complying with a reduced respirable dust standard and resume mining at the same location under a respirable dust standard of 2.0 mg/m^3 and (2) terminate an outstanding citation for excessive respirable dust concentrations without verification that dust control parameters effectively controlled respirable dust. At UBB, MMUs generally were deactivated, and replacement MMUs activated, on the same day. In some cases, MMUs were deactivated after the replacement MMUs were already activated.

By replacing MMUs in this manner, the Operator potentially exposed miners to harmful levels of respirable dust for extended periods of time. The Operator's manipulation of MMUs on a section at UBB is best illustrated with the example of 3 Section. This section was operated as a super section from the last quarter of fiscal year 2008 through the second quarter of fiscal 2010. Beginning on November 4, 2008, the section utilized two continuous mining machine units, MMU 060-0 and MMU 061-0. Based on MSHA respirable dust sampling conducted on December 8, 2008, the respirable dust standards for the MMUs were reduced to 1.0 and 1.3 mg/m^3, respectively. Subsequent MSHA respirable dust sampling on March 9, 2009, further reduced the standard for MMU 060-0 to 0.4 mg/m^3. The Operator deactivated the MMUs on March 24 and April 28, 2009, respectively.

To continue mining on 3 Section, the Operator replaced MMUs 060-0 and 061-0 with two different continuous mining machine units, designated as MMU 064-0 and MMU 065-0, which the Operator activated on March 23 and April 28, 2009, respectively. Each MMU started production with a respirable dust standard of 2.0 mg/m^3. As a result of the first MSHA respirable dust sampling on May 20, 2009, both MMUs were placed on reduced standards (0.7 mg/m^3 and 0.4 mg/m^3, respectively). The Operator submitted bimonthly respirable dust samples for MMU 064-0, collected June 8-11, and results indicated an average dust concentration of 3.73 mg/m^3, more than five times the applicable reduced standard. The maximum exposure concentration was 14.4 mg/m^3.

On June 18, 2009, District 4 issued a section 104(a) citation for the overexposure on MMU 064-0. The citation required the Operator to submit an MMU plan supplement for approval prior to abatement sampling, but it did not require interim changes to the dust control parameters. The inspector set the termination due date for July 21, which was 33 days after the issue date. MSHA received an MMU plan supplement from the Operator on July 24, three days after the termination due date.

District 4 allowed MMU 064-0 to continue operating during the plan review process, including a period during which the District requested additional information from the Operator and waited for a response. Respirable dust sampling on September 1, 2009, maintained the reduced standard for MMU 065-0 at 0.4 mg/m^3. Subsequent MSHA respirable dust sampling on October 7, 2009, further reduced the standard for MMU 064-0 from 0.7 mg/m^3 to 0.5 mg/m^3. This reduction was based on the 22% quartz content of the MSHA sample, since the Operator's optional sample was voided because it contained oversized particles.

District 4 approved the MMU plan supplement on October 27, 2009, which was 95 days after issuing the citation. The Operator collected five bimonthly samples from October 27-30, 2009; however, two were voided because they were collected during shifts with less than average production. The remaining three

valid samples indicated noncompliance with the reduced standard. The citation was extended for a sixth time on November 4 until November 18 to allow additional samples to be collected by the Operator. Before additional samples were collected, the Operator deactivated MMU 064-0 on November 2 and MMU 065-0 on November 9.

To resume mining on 3 Section, the Operator replaced MMUs 064-0 and 065-0 with MMU 066-0 and MMU 067-0, for which it had previously submitted and received District 4 approval of MMU plans. The Operator activated MMU 066-0 and MMU 067-0 on November 2 and November 9, respectively. Again both MMUs started production under a 2.0 mg/m^3 respirable dust standard.

On November 19, 2009, a section 104(b) order was issued for continued noncompliance. The order was terminated when the continuous mining machine was taken out of service and removed from the Mine on December 4. In all, 192 days had elapsed since issuance of the initial citation and termination of the subsequent order.

District 4 sampled MMU 067-0 on December 7 and MMU 066-0 on December 8, 2009. As a result of subsequent analyses conducted at the MSHA Dust Division Laboratory in Pittsburgh (the laboratory), MMU 066-0 remained on a 2.0 mg/m^3 respirable dust standard. MMU 067-0, however, was placed on a reduced standard of 0.8 mg/m^3 after the designated occupation sample's quartz content was found to be 18.7%. On December 22, District 4 sent a letter to the Operator requesting an upgraded MMU plan supplement for MMU 067-0, but did not set a deadline for submission. The Operator never submitted the requested supplement.

District 4 again sampled MMU 066-0 and MMU 067-0 on March 23, 2010. As a result, the respirable dust standard for MMU 066-0 was reduced to 1.7-mg/m^3 and the reduced respirable dust standard for MMU 067-0 was increased to 1.3 mg/m^3. The Operator deactivated both MMUs on April 1, 2010.

In the MSHA Standardized Information System (MSIS), the only identifiers for an MMU and/or a working section are the 4-digit entity number and the location description, which is a freeform text field. There is no place designated to record a serial number for the continuous mining machine, nor is there an explicit reference to the section or location in the mine. Thus, the means for tracking the movement or replacement of specific mining machinery or MMUs in a given mine is not readily available.

During his interview, the Chief of the Coal Health Division stated that when a new MMU number is assigned by using MSHA Form 2000-142 and Item 7C of the form is left blank, the MSHA computer system automatically sets the respirable dust standard to 2.0 mg/m^3, even when the new MMU starts mining in an area of the mine where a reduced standard was in effect. Although Item 7C on the form states: "Headquarters Only," the instructions for the form explain that the district can enter a lower value to retain the reduced standard. The Health Division Chief also stated the issue had not been brought to headquarters' attention, and he expected information about entering a reduced standard had been conveyed to new employees in the District Health Departments.

In interviews, District 4 managers, supervisors, and specialists indicated that they were not aware that, when appropriate, the District could maintain a reduced dust standard associated with the former MMU when a new MMU replaces it on the same working section. Rather, they believed only MSHA headquarters could override the pre-programmed designation.

The MSHA Directorate of Program Evaluation and Information Resources (PEIR) provided training to the districts on the respirable dust database in February 2009. According to PEIR, this topic was reviewed, but not emphasized.

In May 2011, PEIR analyzed the MSHA respirable dust database for actions since October 1, 2008. The analysis showed the following:

- Of the 352 deactivations recorded nationally on MMUs that had been cited for exceeding a reduced respirable dust standard, 29% occurred within 140 days of a citation's issuance. Seven of these deactivations occurred at UBB; 29% (2 of 7) occurred within 140 days.

- Of the 518 MMU activations recorded nationally, only 16 showed dust standard reduction within 30 days. Of those, only one appeared to be a manual over-ride of the applicable respirable dust standard (MSHA Form 2000-142, Item 7C), and it did not involve UBB.

The long timeframes (greater than 100 days in many cases) make the pattern discussed above at UBB difficult to detect at other mines by examining data alone. Temporary deactivations occur regularly and appear to be part of a normal mining cycle. Using data alone, it is difficult to identify mine operators deactivating and moving units to avoid reduced dust standards, as opposed to deactivations and moves for legitimate reasons.

Longwall Mining Section

Statement of Facts: On September 10, 2009, the Operator provided District 4 written notification that the 1 North Longwall (MMU 050-0) was being activated. In 2006, the last respirable dust standard for the previous longwall (MMU 031-0) was 1.7 mg/m^3. The new longwall section was subject to a respirable dust standard of 2.0 mg/m^3. This issue is discussed in detail in the "Longwall 050-0 MMU Plan – Specific Issues" section of the Internal Review report.

The first District 4 respirable dust survey on the longwall section was conducted on November 10, 2009. Results from this survey indicated compliance with the existing 2.0 mg/m^3 respirable dust standard. One of these samples was analyzed for quartz, per standard operating procedures. Laboratory results indicated a quartz content of 6%, which should have resulted in a reduced standard of 1.59 mg/m^3. The average concentration of the samples was in compliance with this reduced standard.

However, MSHA did not place the section on the 1.59 mg/m^3 reduced standard and the applicable respirable dust standard for the longwall remained at 2.0 mg/m^3. This was due to District 4's data entry error, which coded the longwall MMU as a continuous mining machine section in MSIS. As a result of this error, the laboratory identified the mismatch between the specified mining method (continuous mining machine) and the designated occupation (longwall operator - tailgate side). The laboratory voided the samples and reported the discrepancy to District 4 in a report dated November 16, 2009. District 4 corrected the error on December 17, 2009, when the MMU category was changed to "longwall."

Although the 1 North Longwall (MMU 050-0) was activated on September 10, 2009, there were no samples submitted by the Operator for the September-October 2009 bimonthly sampling cycle. District 4 did not cite the Operator for a violation of 30 CFR 70.207(a). Although mine operators are encouraged to sample early in a bimonthly cycle, existing enforcement guidance does not address an operator who does not submit five valid samples when the MMU operates for less than the entire bimonthly time frame.

The first longwall bimonthly respirable dust samples were submitted by the Operator on December 13-17, 2009. The corresponding lab reports indicated that the Operator miscoded these samples, and they were subsequently voided.

Replacement samples were collected by the Operator from December 28-30, 2009 and submitted to the laboratory. The average respirable dust concentration of the samples was 1.71 mg/m^3, which would have exceeded the reduced standard of 1.59 mg/m^3, if the MSHA samples collected in November 2009 had not been voided.

The Operator submitted four valid respirable dust samples collected between January 26 and January 30, 2010, for the January - February 2010 bimonthly cycle. The average concentration of these four samples was 2.58 mg/m^3, which exceeded the existing 2.0 mg/m^3 respirable dust standard. Three of these samples exceeded the respirable dust standard, and the highest concentration was 3.18 mg/m^3. After being notified via an advisory generated by the laboratory, District 4 issued a citation under 30 CFR 70.207(a) on March 10, 2010, for the Operator's failure to collect the required five valid samples on MMU 050-0 for the bimonthly cycle. The termination due date was set at March 31, allowing 21 days to abate the violation. In this case, District 4 could not cite a violation of 30 CFR 70.100(a) for exceeding the 2.0 mg/m^3 respirable dust standard because the Operator did not submit five valid samples.

The citation was later extended after the Operator collected two additional respirable dust samples in March. However, both samples were subsequently voided, one because the cassette did not match the corresponding respirable dust card and the other because the sample type submitted by the Operator was invalid. The citation was then extended until April 29, 2010, and terminated following the explosion.

On March 23, 2010, MSHA again conducted respirable dust sampling on the longwall. On March 29, 2010, the results were mailed to the Operator indicating the silica content of the samples was 8.0%. Consistent with Agency policy, this quartz content was used to reduce the respirable dust standard to 1.3 mg/m^3 because the Operator did not provide optional samples for analysis. The average exposure measured during this survey was 1.39 mg/m^3.

MSHA Respirable Dust Sampling

Statement of Facts: The District 4 Health Department conducted some respirable dust sampling inspections, evaluated sampling results, established and removed sampling entities, established reduced dust standards due to quartz, and monitored mine operator respirable dust control and sampling programs.

District 4 inspectors and specialists conducted respirable dust sampling at UBB during regular quarterly inspections. An MSHA Form 2000-86 was completed for each MMU sampled and included in the respective inspection report. The results of MSHA respirable dust sampling conducted throughout the review period indicated compliance with the applicable respirable dust standards. A review of the inspection reports and MSIS data revealed that District 4 did not collect a sufficient number of valid samples on four producing MMUs as follows:

- Fourth regular inspection for fiscal 2009 (July-September 2009) – On July 8, 2009, an inspector attempted to sample for respirable dust on MMU 029-0 and MMU 040-0, but ventilation problems on the Headgate super section resulted in the samples being voided for inadequate production. Afterward, MMU 040-0 continued to produce for the rest of the quarter. However, status updates from the Operator showed that the MMU 029-0 was only in "producing" status from July 1 through August 11, 2009. Follow-up sampling was conducted by the specialist on MMU 040-0 on September 24, 2009. District 4 did not collect follow-up samples from MMU 029-0 during the inspection.
- Fourth regular inspection for fiscal 2009 (July-September 2009) – On September 1, 2009, an inspector attempted to sample respirable dust on MMU 065-0, but ventilation problems on the section resulted in the samples being voided for invalid sampling time (less than 360 minutes). District 4 did not collect follow-up samples from this MMU during the inspection.
- First regular inspection for fiscal 2010 (October-December 2009) – On November 10, 2009, an inspector collected five personal samples on MMU 050-0, but the designated occupation sample was voided due to a mismatched MMU code. MMU 050-0 was initially designated in the computer system as a continuous mining section rather than a longwall section. The error was corrected on December 17.
- Second regular inspection for fiscal 2010 (January-March 2010) – District 4 did not sample MMU 063-0. Status updates from the Operator showed that the MMU was in "producing" status from January 1–18, 2009, and from February 26 – March 16, 2009. The inspection report did not contain an explanation for the failure to collect samples from the MMU.

The *Coal Mine Health Inspection Procedures Handbook* specifies that district inspectors must sample all underground entities on a quarterly basis, including each producing MMU. While District 4 collected valid samples for 31 respirable dust surveys at UBB during the review period, in the four instances identified above, District 4 did not fulfill this obligation. However, the Handbook does not provide guidance on when re-sampling is necessary to satisfy this requirement.

For the 31 valid respirable dust surveys, the Internal Review team reviewed the corresponding MSHA Form 2000-86's for adherence to the guidelines in the Handbook. None of the forms contained all of the

requisite information to document a complete dust survey, yet each was signed by the field office supervisor indicating the forms had been reviewed. The team also reviewed the field notes for each sampling shift. In some cases, the field notes contained information that should have been recorded on the form.

On the majority of the MSHA 2000-86 sampling forms, the inspector or specialist did not document the method used to determine the tonnage mined during the sampling shift or the average tonnage over the last 30 production shifts. Since the validity of MSHA samples depends on the MMU producing at least 80% of a 30-shift average, it is important to document how this information was obtained. The Handbook directs inspectors to document this information in the comment section of MSHA Form 2000-86.

The Handbook also states that the primary sampling objective is to assess the effectiveness of the dust control parameters in the approved ventilation plan. On 15 of the 31 forms, the observed or measured dust control parameters did not coincide with the approved MMU plan. In these cases, the number of operational water sprays or the water spray pressure exceeded 120% of the plan minimums, and the respirable dust samples collected were in compliance. However, District 4 did not require the Operator to supplement the respective MMU plans to incorporate the enhanced dust control parameters, and the Operator did not unilaterally supplement its MMU plans.

To ensure that all dust control parameters stipulated in the approved ventilation plan are in place and functioning properly during the sampling shift, the inspector is required to make two complete parameter checks, which are to be initiated at least at the beginning of the shift and between the fourth and fifth hour of operation. On 26 of the 31 forms, the inspector or specialist did not document a second parameter check during the respirable dust inspection.

During the review period, two MMUs (029-0 and 040-0) were approved to use flooded-bed scrubbers while mining extended cuts. Inspectors conducting respirable dust surveys were to take Pitot tube measurements during sampling shifts to determine the scrubber volume. In fiscal 2009, Pitot tube measurements were required to be taken on eight sampling shifts. Records indicate that these measurements were only documented on three sampling shifts. In the first half of fiscal 2010, Pitot tube measurements were required to be taken on four sampling shifts. Records show that these measurements were documented on only one sampling shift.

Performance Coal Company Respirable Dust Sampling

Statement of Facts: The respirable dust standards for all of the twelve MMUs (eleven continuous mining machine MMUs and one longwall MMU) operated at UBB during the review period were eventually reduced due to the presence of quartz. At some time during the review period, respirable dust sampling on each MMU indicated a quartz concentration greater than 5%, and the associated standard was reduced below 2.0 mg/m^3.

To comply with 30 CFR 70.207(a), the Operator was required to submit five valid samples for each producing MMU on a bimonthly basis. With twelve MMUs operated at various times during the review period, the Operator should have submitted samples on 58 separate occasions to fulfill this requirement. However, as shown in Table 23, the Operator did not submit five valid samples for 19 separate bimonthly cycles. This accounted for approximately 33% of the 58 required bimonthly samples. District 4 issued only three citations for failure to comply with 30 CFR 70.207(a). On the remaining 16 occasions, the Operator deactivated and then reactivated the MMUs, which reduced the number of days that each operated during the bimonthly period. Although the explosion interrupted the March-April 2010 bimonthly period, it has been included in the table, as the Operator had sufficient time prior to the event to conduct the required bimonthly respirable dust sampling on each MMU because operators are advised to collect samples early in the bimonthly period.

Table 23 - Bimonthly Sampling Periods for Active MMUs without Five Valid Samples

Bimonthly Period	MMU	Valid Operator Samples	MSHA Action Taken	Number of Days Producing
Mar - Apr 2009	060-0*	0	None	23 days
Mar - Apr 2009	062-0	0	None	39 days
Mar - Apr 2009	063-0	0	None	39 days
Jul - Aug 2009	029-0*	0	None	41 days
Sep - Oct 2009	029-0*	1	None	29 days
Sep - Oct 2009	050-0	0	None	52 days
Sep - Oct 2009	064-0*	3	Citation Issued	61 days
Sep - Oct 2009	065-0*	0	Citation Issued	61 days
Nov - Dec 2009	040-0*	0	None	33 days
Nov - Dec 2009	062-0*	4	Citation Issued	61 days
Nov - Dec 2009	065-0*	0	None	8 days
Jan - Feb 2010	062-0*	0	None	25 days
Jan - Feb 2010	063-0*	0	None	17 days
Mar - Apr 2010	029-0	0	None	36 days
Mar - Apr 2010	040-0*	0	None	20 days
Mar - Apr 2010	050-0	4	None	36 days
Mar - Apr 2010	063-0*	0	None	15 days
Mar - Apr 2010	066-0*	0	None	28 days
Mar - Apr 2010	067-0*	0	None	28 days

*MMU on a reduced respirable dust standard due to excess quartz

During interviews, the Health Department supervisor stated that District 4 had a long-standing practice of not citing mine operators for such failures if the MMU did not operate for at least 45 days during the bimonthly sampling period. However, given District 4's practice, there was at least one instance in which the Operator should have been cited for failing to submit five valid bimonthly samples – i.e., the September-October 2009 bimonthly period for MMU 050-0, which was in active status for 52 days during the period.

The Health Department supervisor further stated that this topic was discussed at a Coal Health supervisors meeting in Beckley, West Virginia, on May 24-25, 2011. Discussion between the health department supervisors revealed no consistency between Coal districts in the number of days an MMU must be in active status before a citation is issued for failure to submit the required bimonthly samples.

The Chief of the Coal Health Division confirmed that district offices follow varying approaches when determining compliance with the bi-monthly sampling requirement regarding the submission of respirable dust samples. Some districts do not cite the operators unless the MMU is active for the entire 60 days; some districts expect samples to be collected if the MMU is active for at least 30 days; and others base enforcement actions on 45 days in active status during the bi-monthly period. These approaches were developed in response to earlier legal decisions vacating MSHA citations that were issued to operators who had not produced coal during some or all periods of the bi-monthly cycle.

District 4 health specialists issued five section 104(a) citations at UBB for violations of 30 CFR 70.100(a) or 30 CFR 70.101 when miners' exposures exceeded the applicable respirable dust standard as indicated by the Operator's bimonthly sampling results. Table 24 illustrates the subsequent actions (extensions and terminations) with corresponding time frames for the respirable dust citations issued.

On each occasion, the Operator submitted an MMU plan supplement with enhanced or additional engineering controls. For section 104(a) citation Nos. 9968791, 9968749, and 9968302, the Operator collected and submitted five valid, compliant samples, as required by 30 CFR 70.201(d), and the respective citation was terminated. Due to the explosion, section 104(a) citation No. 9968854 was terminated before this requirement could be met.

For section 104(a) Citation No. 9968698 and subsequent section 104(b) Order No. 8078369, the Operator never achieved compliance with respirable dust standards during sampling on 3 Section (MMU 064-0). Instead, the Operator waited for over five months and then deactivated the MMU and replaced it with previously approved MMU 066-0. The Operator activated the new MMU under a 2.0 mg/m^3 respirable dust standard. District 4 did not confirm by sample analyses that the quartz content of respirable dust was reduced to warrant a change in the standard. (See previous discussion under "Continuous Mining Machine Sections.")

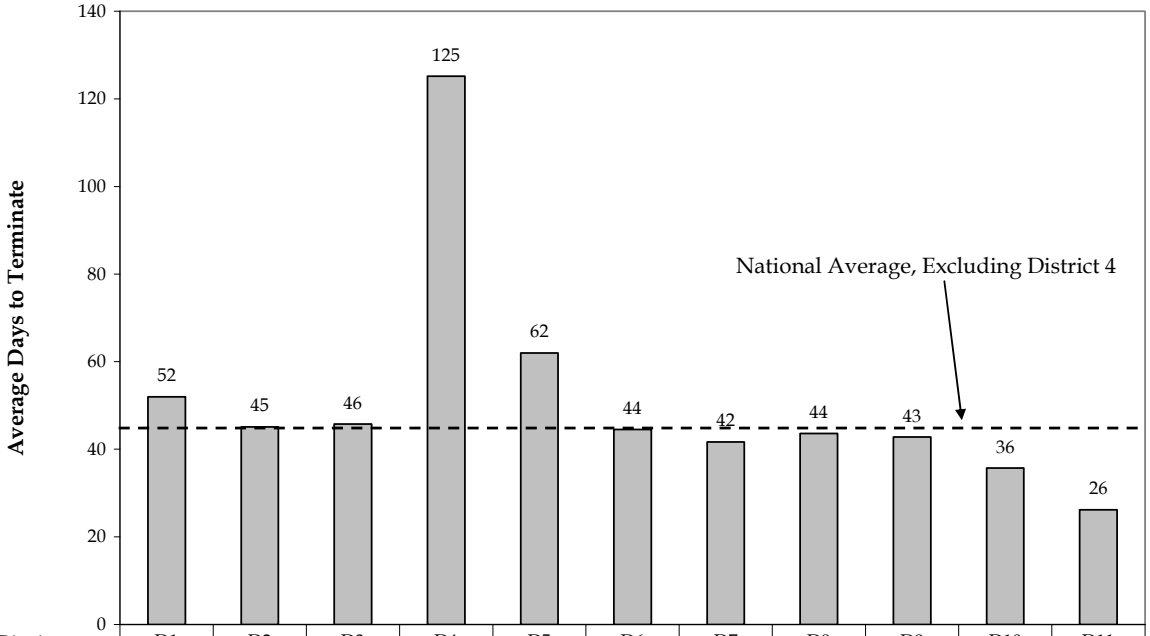
Inspectors set initial termination due dates for these citations ranging from 14 to 33 days after issuance to allow the Operator time to submit MMU plan supplements. These citations were subsequently extended 24 times for periods ranging from 8 to 25 days. Sixteen of the 24 (67%) extensions were granted to allow additional time for the plan review process. On average, it took 124 days for an excessive respirable dust citation to be terminated. In these cases, dust overexposures may have existed for months.

Table 24 - Respirable Dust Citations and Subsequent Actions

Citation Number	MMU	Date Issued	Termination Due Date	Date Extended	Date Extended To	Number of Days	Date Terminated
9968791	029-0	12/04/09	12/31/09	12/31/09	01/21/10	21*	4/8/10
				01/22/10	02/11/10	20*	
				02/10/10	03/04/10	22	
				03/03/10	03/24/10	21	
				03/25/10	04/08/10	14	
9968749	040-0	09/29/09	10/20/09	10/22/09	11/16/09	25*	04/08/10
				11/18/09	12/09/09	21*	
				12/10/09	12/28/09	18*	
				12/31/09	01/21/10	21*	
				01/22/10	02/11/10	20*	
				02/10/10	03/04/10	22	
				03/03/10	3/24/10	21	
				03/25/10	04/08/10	14	
9968302	041-0	09/10/08	9/24/08	10/01/08	10/15/08	14*	12/16/08
				10/22/08	11/12/08	21*	
				11/18/08	11/26/08	8*	
				12/04/08	12/11/08	7	
9968698	064-0	06/18/09	7/21/09	07/24/09	08/17/09	24*	Replaced by Order 11/19/09
				08/20/09	09/10/09	21*	
				09/10/09	09/24/09	14*	
				09/24/09	10/15/09	21*	
				10/15/09	11/05/09	21*	
				11/04/09	11/18/09	14	
8078369†	064-0	11/19/09	---	---	---	---	12/04/09
9968854	066-0	03/02/10	03/16/10	03/18/10	04/08/10	21*	04/08/10

* Extension granted for District 4 plan review.
† Section 104(b) order for continued non-compliance.

Figure 23 shows the average number of days in each Coal district to terminate citations issued for violations of 30 CFR 70.100(a) or 30 CFR 70.101 when miners' exposures exceeded the applicable respirable dust standard during the review period. The average time to abate violations of 30 CFR 70.100(a) and 30 CFR 70.101 at UBB was consistent with the average time to abate similar violations at other mines in District 4. However, the average time to abate violations of these respirable dust standards in District 4 was almost three times the average for all other districts.



Coal District	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11
Avg. Days	52	45	46	125	62	44	42	44	43	36	26
Violations Cited	1	19	9	109	26	49	33	26	15	21	17

Figure 23 - Average Days to Terminate Violations for Exceeding Respirable Dust Standards.

The District 4 Health Department supervisor stated in an interview that, when a mine operator was cited for an overexposure under 30 CFR 70.100(a) or 30 CFR 70.101, the district required an upgrade to the existing plan to enhance dust controls. If noncompliance continued, a section 104(b) order was issued and the MMU was shut down until "meaningful" changes to the plan were made and additional dust control measures were implemented. During the review period, District 4 inspectors and specialists issued nine section 104(b) orders, including the aforementioned order at UBB.