EXECUTIVE SUMMARY

Ventilation Summit
National Mine Safety and Health Academy
February 21 and 22, 2007

Introduction:

The summit featured representative speakers from the Mine Safety and Health Administration (MSHA), National Institute of Occupational Safety and Health (NIOSH), National Mining Association (NMA), and the United Mine Workers of America (UMWA). Subjects covered included bleeder and gob ventilation policy, bleeder design, internal air flow paths, bleeder system evaluation, spontaneous combustion, eastern longwall bleeder systems, western longwall bleeder systems and room and pillar bleeder systems, bleeder examinations, seal policy, seal approvals, industry perspective on seals, seal evaluation methods, and explosion pressure design.

Bleeder and Gob Program Policy Letter:

The Program Policy Letter, application of 30CFR Part 75.323(e), described MSHA's policy for determining the location of the 2.0 percent methane limit in a bleeder split. The draft Program Policy Letter, application of 30 CFR Part 75.334(b) (1), described MSHA's policy for evaluating the effectiveness of bleeder systems. A bleeder system includes the area from which pillars are wholly or partially extracted (including the internal airflow paths), bleeder entries, bleeder connections, and all associated ventilation control devices that control the air passing through the pillared area.

Bleeder Design:

A number of design criteria should be considered for bleeder systems. Design considerations include, ground control, life of system, airflow distribution, method of evaluation and considerations for future sealing.

Internal Air Flow Paths:

Airflow paths are affected by the length and width of the longwall panels, incomplete caving, entry support and water accumulations. Discussion of ignition and explosion history also covered in this presentation.

Bleeder System Evaluation:

Bleeder systems control the airflow and dilute harmful gasses. Examinations provide the means of evaluating the system. Examination of inlets, outlets, and measurement point locations provide the information necessary to conduct an evaluation of the bleeder system.

Spontaneous Combustion Issues:

Oxidation of the coal, low airflow, and heat of combustion not dissipated results in spontaneous combustion in certain coals that are susceptible to spontaneous combustion. In coal seams determined to be susceptible to spontaneous combustion, provisions are included in the approved ventilation plan that specify the actions that will be taken to protect miners from the hazards of spontaneous combustion.

Eastern Longwall Bleeder Systems:

This session discussed longwalls and bleeder ventilation in mines located in the Eastern United States. Use of degasification systems to control methane in the bleeder and gob, bleeder system evaluation and multiple bleeder districts and use of two longwalls on the same bleeder system were discussed.

Western Longwall Bleeder Systems:

This session discussed longwalls and bleeder ventilation in mines located in the Western United States. Use of degasification systems to control methane in the bleeder and gob, bleeder system evaluation, use of gas chromatographs and bleederless systems were discussed. Also control of spontaneous combustion is a major issue in western mines.

Room and Pillar Bleeder Systems:

This session discussed room and pillar mining and bleeder ventilation in mines using room and pillar mining methods. Use of degasification systems to control methane in the bleeder and gob, bleeder system evaluation and sealing of mined out panels are major issues in room and pillar mining. Training the next generation of miners was also discussed during this session.

Bleeder Examinations:

Mine examiners representing the UMWA relayed their experiences and problems encountered while conducting examinations of bleeders. Water accumulations, deteriorating roof and rib conditions, accumulations of high methane and single travel ways pose hazards to the examiners.

Seal Policy:

Current regulations require solid concrete blocks, “Mitchell-Barrett”, seals. Program Information Bulletin (PIB) P06-16 was issued to address alternative seals requiring seals to withstand 50 psi overpressure and be designed for the conditions in which the seal will be built, designed and certified by a structural professional engineer (PE) and the construction and materials certified by senior mine management.

Seal Approvals:

Procedures for alternative seal design approval include plan submittal to the MSHA District Manager, plans are then forwarded to MSHA Pittsburgh Technical Support for technical review, and plan is evaluated for technical completeness, engineering calculation, material property testing, construction specifications, quality control measures and engineering certification. Recommendation is then made to the District Manager for approval or resolution of indicated deficiencies or issues.

Industry Perspective on Seals and Sealed Areas:

Mitchell-Barrett seals are labor intensive requiring material handling and hitching. The seal does not perform well in high convergence area and leakage is possible increasing the possibility of spontaneous combustion. Alternate seal approvals are resulting in extended time periods where the gobs are open and creating uncertainty for the mining industry.

Seal Evaluation Methods at Lake Lynn Experimental Mine:

Discussion of evaluation methods used at the Lake Lynn Experimental Mine including, chamber approach for evaluation seals, pressure loading methods for closed chamber studies, and head-on pressure loading.

Explosion Pressure Design Criteria for Seals in U.S. Coal Mines:

NIOSH released a draft report in February 2007 that calls for a comprehensive new approach for seals. According to the draft seals for areas that are actively managed would be limited to 50 psi. Active management, a practice used in Australia and elsewhere, involves ensuring the atmosphere behind the seal to be regularly monitored and steps taken to ensure the methane behind it stays at safe levels or that miners are evacuated. If sealed areas are not managed, however, explosions can generate forces of 120 psi and pulses of up to 640 psi. The NIOSH report suggests a number of ways in which seals can be feasibly designed to withstand these pressures. It also recommends several steps to ensure that seals are properly constructed.