

Minutes

MINE SAFETY AND HEALTH RESEARCH ADVISORY COMMITTEE (MSHRAC) MEETING
JANUARY 22-23, 2008
HILTON GARDEN INN – SOUTHPOINTE
CANONSBURG, PA 15317

Committee Members & Attendees Present

Dr. Mary M. Poulton, Department Head, University of Arizona, MSHRAC Chair, called the meeting to order. The following members were present:

Mr. Brent Chamberlain, Director of Human Resources, Safety, and Health, General Moly, Inc.
Dr. Robert Cohen, Associate Chair, Pulmonary Division, John H. Stroger Jr. Hospital of Cook County
Ms. Kathleen O'Doherty, Corporate Industrial Hygienist, Hanson Building Materials America
Mr. Dennis O'Dell, Administrator for Occupational Health and Safety, United Mine Workers of America
Dr. Syd Peng, Professor and Mining Engineering Department, West Virginia University
Mr. Emmett Russell, Director, Department of Safety and Health, International Union of Operating Engineers
Mr. Joseph Sbaffoni, Director, Bureau of Deep Mine Safety, Pennsylvania
Mr. Bruce Watzman, Vice President of Safety, Health, and Human Resources, National Mining Association
Mr. Michael Wright, Director of Health, Safety and Environment, United Steelworkers of America
Dr. Jeffery Kravitz, Chief, Special Projects/Mine Emergency Operations, MSHA
Dr. Jeffery L. Kohler, Executive Secretary to MSHRAC, Associate Director for Mine Safety and Health Research, NIOSH

The following presenters and attendees were also present:

Lewis V. Wade, NIOSH, Washington, DC
Marie Chovanec, NIOSH, Pittsburgh, PA
Sid Soderholm, NIOSH, Washington, DC
Karen Niezgod, NIOSH, Pittsburgh, PA
Jeff Welsh, NIOSH, Pittsburgh, PA
Jürgen Brune, NIOSH, Spokane, WA
Steven Tadolini, NIOSH, Pittsburgh, PA
Ed Thimons, NIOSH, Pittsburgh, PA
Steve Signer, NIOSH, Spokane, WA
Chris Mark, NIOSH, Pittsburgh, PA
Jim Newhall, NIOSH, Atlanta, GA
Jay Colinet, NIOSH, Pittsburgh, PA
Jim Sharpe, Sharpe Media, LLC, Arlington, VA
Alan Martin, DEP-Mine Safety, PA
David Snyder, NIOSH, Pittsburgh, PA

R.G. Grtunca, NIOSH, Pittsburgh, PA
 Floyd Varley, NIOSH, Spokane, WA
 Cindy Mytrysak, NIOSH, Pittsburgh, PA
 John Breslin, NIOSH, Pittsburgh, PA
 Pam Drake, NIOSH, Spokane, PA
 Eric Bauer, NIOSH, Pittsburgh, PA
 Kathleen Kowalski Trakofler, NIOSH, Pittsburgh, PA
 Gerald Finfinger, NIOSH, Pittsburgh, PA
 RJ Matetic, NIOSH, Pittsburgh, PA
 Marlene Ackman, NIOSH, Pittsburgh, PA
 Michael Jenkins, NIOSH, Spokane, WA
 David K. Ingram, NIOSH, Pittsburgh, PA
 Sonja Haber, HPA, New York, NY
 V.J. Karra, NIOSH, Pittsburgh, PA
 Patrick Dempsey, NIOSH, Pittsburgh, PA
 Joe Burkhart, NIOSH, Morgantown, WV
 E.L. Petsonk, NIOSH, Morgantown, WV

The minutes from the last meeting were read and approved.

DR. LEWIS V. WADE FOR DR. JOHN HOWARD, REPORT FROM THE DIRECTOR, NIOSH

Dr. Lewis Wade, NIOSH Senior Science Advisor, represented Dr. Howard. Dr. Howard sent his regrets for not being at the meeting, but he had to attend an unanticipated Congressional Hearing on NIOSH's efforts related to the World Trade Center. Dr. Wade provided an update of recent new appointments for senior position in NIOSH including: Margaret Kitt, Associate Director for Emergency Preparedness and Response; Christine Branche, Principal Associate Director; Anita Schill, Associate Director for Science, and Jim Newhall, Director of Office of Extramural Research. Only one vacancy remains, the Director of the Division of Applied Research and Technology, which NIOSH expects to fill by late February or March. Dr. Howard's appointment as the NIOSH Director is set to expire in July. Although there is uncertainty with that position, we expect stability in NIOSH as the leadership below him is set and will remain in place. Dr. Wade also provided an update on that National Academy of Sciences (NAS) review of the NIOSH research programs. To date, eight have been completed, representing 75% of the funds in NIOSH's research portfolio. We will be pausing now to assess if the investment in the review process has been justified based upon NIOSH being able to use the feedback to make the programs better. Dr. Wade provided updates on other programs within NIOSH including dose reconstruction, research-to-practice (r2p) for contract workers, and first responders to the World Trade Center. Dr. Wade summarized the FY2008 NIOSH Budget. The overall budget increased by \$69 million to \$381 million. This included specific increases of \$58 million for the World Trade Center, \$10 million for Mining, and \$10 million for NORA, which means that there will need to be cuts in other parts of the program. The Mining budget includes about \$50 million for research and facilities costs. Dr. Wade thanked the Committee for their service which is critical to NIOSH, and it is important for NIOSH leadership to hear what the Committee has to say.

DR. JEFFERY L. KOHLER, REPORT FROM THE ASSOCIATE DIRECTOR FOR MINING SAFETY AND HEALTH, NIOSH

Dr. Kohler presented the report of the Associate Director for Mine Safety and Health Research to the Committee. His report provided an update on the status of the health of the NIOSH Mining Program. Research portfolio topics highlighted included next generation coal dust control, mining under more adverse conditions, rock dusting guidelines, noise controls, the “Tame-the-Flame” campaign, diesel workshops, underground stone seminars, and progress under the MINER Act and Emergency Supplemental Appropriation. The Mining budget has increased through the 2006 and 2007 Emergency Supplemental Appropriation and the 2008 Appropriation. The Mining program continues to face staffing and recruiting issues. The Office of Mining continues to provide scientific support to inform legislative and policy activities including responding to requests from Congress, GAO studies, OIG investigations, and requests from MSHA, states, and stakeholders. All NIOSH mandates under the MINER Act have been completed or implemented. Dr. Kohler also provided an overview of the agenda and the goals for the Committee for this meeting. The two major discussion topics will be the National Academy of Sciences review of the NIOSH Mining Program and the congressionally mandated deep mine retreat mining study. The committee is expected to provide input on NIOSH’s response and action plan.

DR. GERALD L. FINFINGER, OFFICE OF MINE SAFETY AND HEALTH RESEARCH, NIOSH

Dr. Gerald Finfinger, Acting Deputy Director, Office of Mine Safety and Health Research, provided an update on the progress of the Broad Agency Announcement (BAA) solicitation for contract awards to address the high priority disaster prevention needs of the underground coal mining industry. The BAA solicited research contract proposals for the areas of explosion prevention, fire prevention and suppression, communication and tracking systems, mine escape and mine rescue. Contracts have been awarded in a variety of areas that include improved mine seal performance, mine seal design, fire prevention, emergency training, mine escape, communication systems and tracking systems. A total of 53 contract proposals have been received and reviewed and 32 proposals received favorable technical reviews. The BAA solicitation remains open until September 2008.

MR. DAVID SNYDER, OFFICE OF MINE SAFETY AND HEALTH RESEARCH, NIOSH

David Snyder, Senior Mine Electrical Engineer, Office of Mine Safety and Health Research provided an update on the progress of the research and development efforts in the area of communications and tracking systems. NIOSH has made seven contract awards through competitive solicitations and Inter-Agency Agreements with additional awards planned. The areas of communications development include survivable leaky feeder and wireless mesh systems, medium frequency “parasitic propagation” systems, and through-the-earth systems. The areas of development for location systems include radio “node” based systems, reverse RFID, and inertial navigation based systems. Supporting contracts in the areas of testing, modeling, and engineering guidelines have also been awarded. Technology readiness, anticipated additional projects, and research gap areas were discussed. Prototype equipments and demonstration systems will be delivered in the upcoming year.

DR. ERIC BAUER, OFFICE OF MINE SAFETY AND HEALTH RESEARCH, NIOSH

Since the enactment of the MINER Act, NIOSH has been conducting research on refuge alternatives as required in the Act. Efforts have focused on defining the utility, practicality, and

survivability of refuge alternatives in underground coal mines. In addition, testing of commercially-available refuge chambers was conducted. A number of contract and in-house research efforts were initiated to provide information for preparing the report to Congress which was completed in December of 2007. These efforts included determining the extent of use of refuge chambers in the U.S. and other countries, understanding the moving and economic issues, defining location parameters based on escape issues and explosion pressures, and characterizing the parameters that make refuge alternatives survivable post-disaster. The survivability evaluations of commercially-available refuge chambers revealed a number of issues including the ability to scrub CO₂, supply O₂, inability to minimize heat and humidity, conflicting instructions, and longer than expected deployment times. These issues have been discussed with the chamber manufacturers and with NIOSH's assistance; most have been addressed and corrected. Future efforts will include identifying and addressing long term research needs, preparing publications of all refuge alternatives research findings, and continue working group interactions with MSHA Approval & Certification Center.

DR. CHRISTOPHER MARK, PITTSBURGH RESEARCH LABORATORY, NIOSH

When coal is first mined, large pillars of coal are left to support the rock between the mine and the surface. When these pillars are later recovered, the ground collapses. Nationally, coal pillar recovery accounts for just 10% of coal mined underground, but it has historically been associated with more than 30% of roof fall fatalities. NIOSH has been conducting research to reduce the ground fall hazard during pillar recovery for more than a decade. Committee members were given copies of major NIOSH research reports and papers several weeks before the meeting. NIOSH research has addressed both global stability and local stability. Global stability requires proper pillar design. NIOSH collected hundreds of case histories of pillar design performance, and used statistical analysis to develop design guidelines that were incorporated into the Analysis of Retreat Mining Pillar Stability (ARMPS) computer package. The research had a particular focus on deep cover pillar recovery, and identified barrier pillar sizing as a critical component of successful designs. Local stability means roof support in the active working area, and NIOSH has published a number of recommendations pertaining to the final stump, the use of mobile roof supports, and supplemental roof bolting. Currently, NIOSH is responding to a Congressional mandate for research into safety during deep cover pillar recovery. This effort will entail field studies and collection of additional case histories, as well as collaboration with West Virginia University, the University of Utah, and MSHA. There was extensive committee discussion of the needs of such a study, the methods, and the proposed NIOSH approach.

MR. FLOYD VARLEY, SPOKANE RESEARCH LABORATORY, NIOSH

Floyd Varley presented on a new (FY 2008) research project at the Spokane research Laboratory (SRL) "Dynamic Failure Control Program for Deep Coal" led by Dr Jeff Whyatt. The peer reviewed and approved project will examine methodologies to identify threats to a mine design, identify practical monitoring technologies and develop means to limit the potential hazard of mine bumps in deep coal. The project background and justification was presented through analysis of MSHA statistics and examination of historic failures.

DR. JEFFERY L. KOHLER, DR. GERALD FINFINGER, DR. GÜNER GÜRTUNCA, AND DR. JÜRGEN BRUNE, OFFICE OF MINE SAFETY AND HEALTH RESEARCH, NIOSH

The National Academy of Sciences (NAS) review of the NIOSH Mining Program was a major topic covered during the meeting. The NAS assessed the relevance and impact of the program. The Mining Program received a rating of 4 of 5 for both areas. To allow time for Committee review and preparation, NIOSH had provided copies in advance of the NAS report as well as the proposed NIOSH response and action plan for the NAS recommendations. Dr. Kohler presented an overview of the materials that had been sent to the Committee and led a discussion on the Committee's input. NIOSH will take action to move the program closer to the "ideal" program envisioned by the review committee, continue to focus resources on the greatest needs of the customers, and balance the need to invest in solving problems and disseminating solutions with the need to assess intervention effectiveness.

DR. SONJA HABER, HUMAN PERFORMANCE ANALYSIS CORP.

Dr. Haber presented information on a pilot project, "Safety Culture Assessment in Underground Coal Mining. Safety culture refers to the characteristics of the work environment, such as the values, rules, and common understanding the influence employees' perception and attitudes about the importance that the organization places on safety. The study included all functional areas at the mine and relevant corporate functions of the company. The research team was on site in the summer of 2007 to administer surveys and conduct interviews and observations. The pilot study was able to determine that the methodology used was feasible and useful for future studies, the process was able to define an existing safety culture, and they were able to make recommendations for continuous improvement for the mine.

DR. EDWARD L. PETSONK, DIVISION OF RESPIRATORY DISEASE STUDIES, NIOSH

Dr. Petsonk presented an update for the Committee on the recent trends in coal workers' pneumoconiosis (CWP) among underground coal miners. The data for his presentation were derived principally from the congressionally-mandated NIOSH coal workers' health surveillance program. Cited publications included the most recent NIOSH Work-related Lung Disease Surveillance Report <http://www2a.cdc.gov/drds/WorldReportData/>, three articles from the CDC's Morbidity and Mortality Weekly Report, and a peer-reviewed research article demonstrating geographic clustering of rapidly progressive cases of CWP. Over the last ten years, the prevalence of CWP has doubled among US miners participating in the NIOSH x-ray surveillance program. The recent data document the rapid onset and progression of pneumoconiosis among working underground miners, the occurrence of disease among young miners, and the continuing development of massive fibrosis, the most disabling and lethal form of pneumoconiosis. The data indicate inadequate health protection for some miners and the need for additional measures to control dust exposures. Potential etiologies were mentioned in the presentation, including enforcement dust samples being unrepresentative of miners' actual exposures, deficiencies in current dust control plans, increased inhalation of dust and reduced time to clear dust from the lungs due to miners working longer shifts and work weeks, increased exposure to respirable silica exposure, and increased toxicity of dust due to changes in the surface properties and size distribution of respirable mine dust.

DR. GÜNER GÜRTUNCA, PITTSBURGH RESEARCH LABORATORY, NIOSH

A brief description of the Pittsburgh Research Laboratory in terms of facilities and organizational structure was presented. The research and significant outputs achieved in 2007

were discussed and highlights of human resource management issues were also presented. Some examples of 2008 new research outputs were reported. The newly developed web-based NIOSH Significant Output Matrix (SOM), an internal management tool, was explained to the MSHRAC committee members.

DR. JÜRGEN BRUNE, SPOKANE RESEARCH LABORATORY, NIOSH

Jürgen Brune presented a status update of research activities at the Spokane Research Laboratory (SRL). The program is being re-focused so that research activities represent stakeholder needs and are relevant to mine safety and health issues that are supported by surveillance results. Other important elements are high quality science and the potential for impact with the mine worker community. SRL is conducting a detailed assessment of stakeholder needs as well as surveillance for the western U.S. mining industry, metal/non-metal mining including evaporites and surface mining. New projects initiated at SRL include a look into the causes and the prevention of bumps in deep coal mines, health issues in uranium mining, and an overview of chemical hazards in the mining industry to gain a better understanding of the safety and health concerns and to determine needs for interventions. Chemical hazards will be addressed at the next MSHRAC meeting.

DR. GABRIEL ESTERHUIZEN, PITTSBURGH RESEARCH LABORATORY

There are more than 100 underground stone mines that use the room-and-pillar mining method. Rock falls from the roof and pillar ribs are the cause of about 15% of all injuries in underground stone mines. At present there is no generally accepted method for designing pillar for these mines. NIOSH researchers have completed a study of pillar stability in limestone mines in the Eastern and Midwestern US and developed an empirical chart which allows designers to assess stability hazards in current and future pillar systems. Several methods for transferring the design chart and methodology to stakeholders have been identified to complete the research to practice (R2P) phase of the program, which include the widely distributed "Mining Engineering" publication of the Society for Mining, Metallurgy and Exploration (SME), International Conference on Ground Control in Mining (IGCCM) and the International Journal of Rock Mechanics (IJRM).

DR. JIM NEWHALL, OFFICE OF EXTRAMURAL RESEARCH, NIOSH

Dr. Newhall presented an overview of a new NIOSH funding opportunity. He explained the Request for Applications (RFA) for Mining Occupational Safety and Health Research. The objective of the extramural mine safety and health program is to reduce risks for injury among miners, prevent or minimize hazardous exposures, and translate things that work into practice. The chief requirement for all projects is that they must have a focus on reducing the risks of injuries, illnesses, and deaths that are directly related to working in a mining environment. Currently, \$1.5 million is available for funding, but additional funds may be made available. Up to 4 awards are expected. The application deadline is March 26, 2008, with the earliest anticipated start date of July 2008.

DR. SID SODERHOLM, NORA COORDINATOR, NIOSH

Dr. Soderholm provided information on NIOSH's use of the NORA program for other industry sectors and proposed the creation of a NORA Sector Mining Council that would include two members of MSHRAC. The MSHRAC decided that the Committee itself would take the place of a NORA Sector Council but will remain aware that this is a potential tool that could be used at a future time. Dr. Soderholm will have the NORA web site updated to show that MSHRAC is serving as the NORA Sector Mining Council.

FINDINGS AND RECOMMENDATIONS BY MSHRAC MEMBERS

There was general discussion of the issues among the Members following each of the presentations. The Committee was supportive of the research and the members offered technical suggestions to improve the projects. Specific findings and recommendations included:

- The results of the "Safety Culture" pilot project are significant, and the Committee recommended proceeding with a full project on this topic.
- The Committee completely endorsed the NIOSH response and action plan for the recommendations from the National Academy of Sciences review of the Mining Program.
- The Committee made a number of recommendations related to the planned deep cover retreat mining study:
 - Where possible, the research should be leveraged to include similar rock mechanic behaviors in metal and nonmetal mines. This would include failures in trona mines, metal mines, and evaporate mines. The research should consider stress failures and gas driven failures.
 - Monitoring approaches should be considered as the research program advances and particular topics mentioned by the Committee included seismic monitoring in collaboration with stress measurements. This is of interest as it relates to coal bumps and other types of dynamic failures. The focus needs to be on prevention of these types of failures through proper mine design and the identification of research gaps within this field.
 - There is a need for the development of a best practices guide on how to safely do retreat mining with an emphasis on training. This needs to include the application of technology, proper mine designs, and operational considerations to ensure miner safety. The engineering plan has to incorporate the best practices considerations and provide detailed plans for mining of the coal pillars during the retreat operation.
 - An expansion of the research program is warranted and there should be consideration given to conducting basic studies, including expanded field studies, to advance the understanding of the fundamental mechanisms of bumps and related types of failures. This expansion of research would compliment the empirical studies.
 - The Committee endorsed the plan that was developed to address the mandates of the appropriations bill related to retreat mining.
- The Committee provided an endorsement of the approach and progress that is being made on refuge chambers and communication and tracking systems.

- Following a robust discussion on the contracts and grants, the Committee emphasized a need to use the procurement mechanism that will require specific deliverables that can show useful results. They prefer to see a contract program instead of a grant program.
- The MSHRAC decided that the Committee itself would take the place of a NORA Sector Council but will remain aware that this is a potential tool that could be used at a future time.
- The Committee supports any efforts to purchase the Lake Lynn Laboratory to ensure its long-term availability for mining research.
- Committee strongly supports the efforts to establish a grants program that will build capacity in mining expertise. The most critical area is in mine ventilation. The program should provide grants for research that support MS and PhD students and faculty.
- NIOSH should continue efforts with MSHA leadership to maintain a genuine collaboration between both agencies.
- NIOSH should continue efforts to partner internationally.

The next meeting will include updates on these topics as well as address some of the topics that have received less attention from MSHRAC because of the urgent need to address research topics associated with the passage of the MINER Act. The Committee proposed scheduling the next meeting to coincide with the beginning or ending of MINExpo in September 2008.

The meeting was adjourned.

I hereby confirm these Summary Minutes are accurate to the best of my knowledge.



Dr. Mary M. Poulton, MSHRAC Chair

____ 16 April 2008 _____
Date