



Testimony
Subcommittee on Employment and
Workplace Safety
Committee on Health, Education, Labor and
Pensions
United States Senate

**“Promises or Progress: the MINER Act One
Year Later”**

Statement of

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Introduction

Good morning Madam Chair and other distinguished Members of the Subcommittee. My name is Jeffery Kohler, and I am the Associate Director for Mining and Construction Safety and Health Research at the National Institute for Occupational Safety and Health (NIOSH), which is part of the Centers for Disease Control and Prevention (CDC), within the Department of Health and Human Services. I am pleased to be here today to provide an update on our recent mine safety activities, a progress report on activities that have been initiated under the Mine Improvement and New Emergency Response Act of 2006 (MINER Act), and outline opportunities to further enhance mine safety and health.

The United States is fortunate to have an abundance of mineral resources to power the economy, and the highly skilled men and women who work in the mining industry every day are our most precious resource. Mine safety has improved significantly over the years, and 2005 was the best year on record. Yet, the mine disasters in 2006 and the double fatalities in a Maryland surface coal mine last month serve as painful reminders of the dangers inherent to this industry and our shared responsibilities to help ensure the safety and health of our mine workers.

NIOSH works to eliminate occupational illnesses, injuries, and fatalities through its research and prevention activities. Mining researchers at our Pittsburgh, Spokane, and Lake Lynn Laboratories have a long and successful history of

working in partnership with labor, industry, and state and federal agencies to develop and implement interventions that eliminate or control mining safety hazards or reduce exposure to harmful physical and chemical agents. The work of NIOSH scientists and engineers can be found throughout American mines. This is evidenced by safer design practices, equipment innovations that improve safety or health, technology to improve mine rescue, and improved training programs for miners. Over the years, significant safety and health gains have been achieved through the collective efforts of labor, industry, and government. Yet, more remains to be done, and additional effort will be required just to maintain the historical gains, as changing mining conditions present new safety and health challenges. Our program of mining safety and health research is driven by a strategic plan with specific performance goals. Our plan, developed with extensive customer and stakeholder input, identifies critical needs in mining safety and health knowledge and practices, and establishes research priorities for addressing those needs.

Recent Mine Safety Activities

NIOSH's mining research priorities address disaster prevention and response, traumatic injuries, cumulative trauma disorders, respiratory diseases, and hearing loss. The following three examples illustrate progress in these areas.

Personal Dust Monitor

NIOSH researchers, working in partnership with the Mine Safety and Health Administration (MSHA), labor and industry, and through a research contract to

employ novel technology, successfully miniaturized a mass sensor that enabled a person-wearable dust monitor (PDM) to be built into a miner's cap lamp. An exhaustive laboratory and in-mine testing program was completed in the summer of 2006. Some additional issues related to the accuracy and operation of the PDM were raised in the fall of 2006. Each of these was researched, and the potential concerns were found to be inconsequential. The results demonstrated that the PDM is superior to the existing technology used to determine a miner's exposure to respirable coal dust. It is accurate, precise, durable, and empowers miners and mine management with real-time dust-exposure data. Access to real-time data allows for the prevention of overexposures that lead to the development of Coal Workers' Pneumoconiosis (commonly referred to as "Black Lung" disease). Current technology does not provide this key information until days or weeks after the exposure has occurred.

Coal Dust Explosibility Meter

Rock dust is applied to coal mine surfaces to prevent coal dust explosions, and if sufficient dust is applied, an inert mixture between the two dusts is achieved. The percentage of inert material in the mixture is specified by current regulation. However, a determination of this percentage by an MSHA inspector or mine operator requires taking a sample and sending it to a distant lab for analysis, which can take several days. The coal dust explosibility meter developed by NIOSH and jointly tested by NIOSH and MSHA researchers will allow an immediate or real-time determination by mine operators, or MSHA inspectors, of whether an inert ratio has been achieved. A pre-production model is currently

undergoing approval testing at MSHA, and commercial production of this life-saving, new technology will begin as soon as it is approved for use in underground coal mines. NIOSH received the Research & Development 100 Award of 2006, recognizing the coal dust explosibility meter, as one of the top technological innovations of the year.

Diesel DPM Workshop

NIOSH research benefits mineworkers most when it is adopted into practice at the mines so nearly every NIOSH projects draws on the institute's Research to Practice initiative, which focuses on transferring and translating research findings, technologies, and information into highly effective prevention practices and products which are adopted in the workplace. In the fall of 2006, the Nevada Mining Association asked NIOSH to put together a workshop focusing on practical methods and technologies for the control of diesel particulate matter from mining equipment used in underground mines. NIOSH assembled a team of technical experts from its labs, the mines, and MSHA, and then developed and conducted a training session entitled "DPM Workshop – A Practical Workshop on Strategies and Technologies to Reduce Miners Exposures to Diesel Particulate Matter and Gases" in Reno, NV, in January 2007. Attended by over 175 participants, this was so successful and well received that a second DPM Workshop will be conducted in June in conjunction with the annual Elko Mine Exposition. Similar workshops are being planned in the East to accommodate requests from the coal and stone industries.

Progress Update on NIOSH MINER Act Activities

NIOSH is also making progress in mine safety through the MINER Act. This bipartisan legislation has created an unprecedented environment of partnership among labor, industry, and government. The MINER Act mandates an increased focus on technology development, testing and evaluation to expand the available technologies for disaster prevention and response. As mandated, NIOSH is going through the process required to formally establish the Office of Mine Safety and Health. In the meantime, under my lead as Associate Director, NIOSH continues to coordinate mine safety and health work that occurs across multiple parts of the agency. In addition, NIOSH has established an interagency working group to provide a formal means of sharing technology that would have application to mine safety. The working group currently includes representatives from NIOSH, MSHA, the National Aeronautics and Space Administration (NASA), and a number of research labs or offices from within the Departments of Defense, Energy and Homeland Security.

The MINER Act directs NIOSH to establish a competitive grant and contract program to encourage development, manufacture, performance testing, or investigation of related issues for new mine safety technologies and equipment.

We believe that this can be a powerful vehicle for bringing technology to bear on the solution of mining safety and health problems. The contracts portion of this new program was announced on March 2007, and it will remain open until September 2008. This offering will provide funds to conduct research, exploratory development, testing, or evaluations of new technologies to improve

mine safety, or to adapt technologies from other industries, that could result in improved safety for mine workers (additional details are available at: www.cdc.gov/niosh/mining). We have received proposals for innovations in reinforcing existing mine seals, communications and tracking, and fire suppression technologies, and we are encouraged by the quality of the responses over the short period that the announcement has been open.

The MINER Act also assigns responsibility to NIOSH to conduct research and field tests concerning the utility, practicality, survivability, and cost of various refuge alternatives. Our report will be submitted by December 2007. NIOSH staff began work in this area shortly after the passage of the Act. Significant progress has been made to date. We have examined the use of refuge alternatives in other countries, collected information on practices and regulations, and established refuge chamber collaborations with researchers in Australia and South Africa. NIOSH has collected information, through a contract with the National Technology Transfer Center, on all refuge chamber applications in the U.S., and we have formulated concepts for using refuge alternatives in escape and rescue strategies. NIOSH is also addressing the broader training, maintenance, and inspection issues associated with chamber use, as well as developing protocols for the testing of chambers.

The MINER Act directs MSHA to finalize new standards for the sealing of abandoned areas in underground coal mines. NIOSH initiated an intensive effort to develop an engineering-science basis for MSHA to use in its development of

improved safety standards for sealing of abandoned areas. This effort culminated last week with the release of NIOSH's report on "Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines." We are working closely with MSHA, labor, and industry to resolve technical issues related to improving the safety associated with existing mine seals.

New Innovations - MINER Act of 2006 and Supplemental Appropriation

Moving critical safety technologies, for example oxygen supply, emergency communications, and miner tracking, from the laboratory into the mine is a high priority for NIOSH, as is adapting technologies from other military or civilian applications to the mining industry's needs. The Emergency Supplemental Appropriations Act for Defense, the Global War on Terror, and Hurricane Recovery, 2006 (P.L. 109-234) provided a \$10 million Emergency Supplemental Appropriation (ESA), that will have a very positive effect in increasing the availability of critical oxygen supply, communication and tracking technologies. The goal is to facilitate the adaptation and movement of these technologies from other industries or from prototype stage to commercialization and into the mines, as rapidly as possible, and this is well underway.

Progress towards this goal has been expedited through a structured approach to the challenge. First, NIOSH developed a high-level "road map" for success, taking into consideration, the availability of technologies, commercial availability of equipment, as well as the technical and logistical difficulties in meeting the schedule and performance expectations of the MINER Act. NIOSH determined

that the plan should include improvements to legacy systems as well as the introduction of new technologies. We believed that it was essential to begin with an accurate assessment of the existing technology base in order to set off on a path toward success. The initial challenge for NIOSH was to invest sufficient time in the early analysis to ensure that the contract efforts are in the areas most likely to yield results so that we can help move new technologies into the mines as expeditiously as possible.

Our effort to quickly award the right mix of contracts consisted of two phases: the technical preparation phase and the contract acquisition phase. The technical phase consisted of significant engineering-science work to develop the scope of work for the contracts, testing of system prototypes in operating coal mines and at NIOSH's Lake Lynn Experimental Mine, and evaluation of claims from vendors on technologies that were represented as "solutions" for the mining industry.

Stakeholder meetings including the NIOSH Emergency Communications Partnership were held periodically as well. NIOSH also met with Australian labor, industry, and government officials to review findings and the proposed approach, as well as other alternatives. Within three months after the emergency supplemental appropriation (ESA) was approved, a consensus was reached among all groups that NIOSH's plan for the available funds was appropriately focused on the following: targeting a balanced set of technologies that address the mining community's needs in the critical gap areas; selecting technology subsets that have a higher probability of success in the short term; and meeting the goal of the emergency supplemental appropriation.

The technical preparation phase defined the scope of work and has helped to ensure that the most promising and critical technologies are being supported under the ESA. In the contract acquisition phase, the statement of work for each technology area was developed and contract solicitations were advertised for the purchase of services that will lead to development and demonstration of new technologies to meet the intent of the MINER Act. The ESA is subject to the rules and regulations for full and open competition as prescribed by the Federal Acquisition Regulations. The acquisition phase culminates in contract award, and all contracts have either been awarded or are anticipated to be awarded within the next month.

Table 1 displays the various communication and tracking technology solicitation areas NIOSH is actively pursuing, and the respective anticipated award and completion dates.

Table 1 - Communication & Tracking Procurements

Solicitation	Technical Phase Completion Date	Award Status	Projected Completion Date
Adaptation of the U.S. Army "Kutta" System	August 2006	Awarded January 2007	April 2008
Survivable Leaky Feeder	August 2006	Awarded March 2007	August 2008
Hardened Mesh/Node System	September 2006	Anticipated May 2007	September 2008
Communications Guidelines	November 2006	Anticipated May 2007	March 2008
Tracking System	December 2006	Anticipated June 2007	December 2008

The projected completion dates are based on historical estimates and projections, and are directly dependent on the anticipated award dates being met. It should be noted that a number of factors may affect award dates and therefore project completion, such as the number of bidders, the extent of technical clarification or budget clarification meetings necessary, the complexity of the negotiated changes, and the time allotted to prepare best and final offers.

For oxygen supplies and refuge chambers, Table 2 displays the various solicitation areas NIOSH is actively pursuing, and the respective actual or anticipated award dates. As indicated in the table, the initial technology survey contract work has been completed.

Table 2 - Oxygen Supplies and Refuge Chambers

Solicitation	Technical Completion Date	Award Status	Projected Completion Date
Refuge Chambers Survey	July 2006	Awarded September 2006	Completed
Hybrid SCSR	August 2006	Awarded February 2007	August 2008
Dockable SCSR	August 2006	Awarded February 2007	August 2008
Refuge Chamber/ Trapped Miner Location – Preliminary Study	October 2006	Awarded November 2006	Completed
Refuge Alternatives	December 2006	Awarded April 2007	November 2008

Technology Availability and Progress Summary

The products resulting from NIOSH development efforts are expected to become available in 2007 and continue into 2008 and beyond. These solutions are focused on providing the best approaches to meet the challenges that the MINER Act aims to address.

In order to move forward with our work under the Act and the Emergency Supplemental Appropriation, NIOSH has developed a communications systems “road map,” which defines specific requirements based on a set of assumptions. This “road map” describes available communications technologies today and outlines viable technical options for upgrading those investments to provide even greater functionality during post-accident scenarios as the new technologies come online.

Next Steps to Continue Enhancing Mine Safety and Health

The implementation of the MINER Act of 2006 will drive significant improvements to mine safety, especially in practices related to disaster response. An important opportunity exists today to shift the focus to prevention – of explosions, fires, inundations, injuries, and occupational illnesses. I will use two examples here to illustrate next steps: a change of approach using real-time dosimetry to eliminate Black Lung disease; and the broad-based approach of risk analysis and management as a vehicle to reduce harm.

Black Lung disease continues to be a serious problem. Despite the progress that has been made, and the declining number of cases, between 2000-2004 more than 4100 men and women died from this debilitating lung disease. While the dust exposures leading to Black Lung can take years or even decades to produce their deadly results, we think it is time to take a different approach. Technological advancements are making possible real-time dosimetry. The Personal Dust Monitor (PDM), which I described earlier, makes it possible to measure dust exposure in real time, rather than waiting a week or more for the lab results of the current sampler. NIOSH is studying how miners use the PDM, and we have seen respirable dust exposure reductions of 50% over a several week period, as the face crews have acted on the information available from the PDM. The PDM would allow exposures to be automatically downloaded to a database for every working shift. Such data would be invaluable to lower exposures and to assure that exposures remain low on every shift. Thermo Fisher Scientific Corporation, (Franklin, MA) recently bought the rights to the PDM and is poised to begin commercial production of the device. The company estimates availability of PDMs within 4-6 months after the completion of all rulemaking.

The concept of "zero harm" has developed over the years and has the objective of reaching a point where there are zero fatalities and serious injuries. This concept was applied in the Australian mining industry over a decade ago after the Moura Mine disaster, and we could benefit from applying those lessons in the U.S. mining industry today. In Australia, they began the transition from a

compliance-based system to a more proactive risk-based system. This was highlighted in the report of the Mine Safety Technology and Training Commission published in December 2006, in which that tripartite commission clearly stated the necessity of establishing an objective of zero fatalities and serious injuries, and laid out a path to its achievement. While the “path” is articulated in 75 recommendations, its vision really reduces to creating and enabling a culture of prevention. An important foundation for a culture of prevention is risk analysis and management. Risk analysis and management is practiced to some extent at many mines, and in some mines it is a fairly formal and well-developed process. However, the opportunity exists for it to be practiced at every mine.

The existence of a regulatory structure and enforcement of regulations are prerequisites to the success of the risk-based approach. However, compliance with regulations alone will be insufficient to achieve the goal of zero harm. Thus, the opportunity is to complement the existing regulatory structure with a risk-based approach to improving safety and health. It took the Australians a decade to develop the robust structure that we see today, but we need to make a start in this country.

We have developed a project at NIOSH to begin an industry-wide process. Initially, we are focusing on major or catastrophic hazards, such as explosions, fires, and inundations. We have conducted workshops, with the help of Australian experts, and we have worked with labor and management at nine mines, five in underground coal and four in underground metal/nonmetal, to

conduct major hazard risk analysis and management planning. These case studies are being used to prepare workbooks and templates for application by other mines. Additional case studies and workshops are in process. This will be followed by a national effort to educate and train the industry to utilize this powerful tool.

Conclusion

In closing, NIOSH continues to work diligently to protect the safety and health of mineworkers. The MINER Act and supplemental funding for mining research are enabling us to make significant improvements in the areas of communication and tracking, oxygen supply, and refuge alternatives. Moreover, our safety and health research program is addressing the critical areas identified by our customers and stakeholders, and through our research, development, demonstration, and diffusion activities, we are enabling a shift to a prospective harm reduction culture in the mining. I appreciate the opportunity to present our work to you and thank you for your continued support. I am pleased to answer any questions you may have.