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Learning from the Upper Big Branch Tragedy

Jeffery L. Kohler, Ph.D.

Associate Director for Mining, and
Director, Office of Mine Safety and Health Research,
National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention
U.S. Department of Health and Human Services

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Good morning Mr. Chairman and other distinguished Members of the Committee. My name is Jeffery Kohler, and I am the Associate Director for Mining and the Director of the Office of Mine Safety and Health Research (OMSHR) 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.

NIOSH continues to develop and deploy new practices and technologies that make mines safer and help miners remain healthy. Some of these have been described to you in the past, when they were in the developmental stage. Today, I will give you an update on a few of them, and I will tell you about newer projects that are currently underway.

The MINER Act of 2006 (P.L. 109-236) placed a special emphasis on the development, adaptation, and transfer of technologies to improve safety and health in the mining industry. New technologies to improve the post-accident survivability of miners, envisioned after the Sago Mine disaster in 2006, are commercially available today, and many have been deployed in the industry. Many of these were made possible through the work of NIOSH and because of the support provided by the Congress.

Ongoing partnerships with labor, industry, and government continue to facilitate the development of practical solutions to challenging and pervasive mining safety and health problems, and today I will tell you about one such effort. I will also speak to you about the work of the Independent Panel that assessed the process and outcomes of the Mine Safety and Health Administration's (MSHA) Internal Review of the Upper Big Branch Mine disaster. I was appointed to serve as the Executive Secretary of the panel.

NIOSH's mining research priorities address disaster prevention and response, traumatic injuries, cumulative trauma disorders, respiratory diseases, and hearing loss. In the area of disaster prevention, rock dust is applied to coal mine surfaces to prevent coal dust explosions, but to be effective, it must be applied in sufficient quantity to achieve an 80% or greater ratio of incombustible material. A laboratory test is the only way to determine whether the coal dust is no longer explosive. Historically, a sample was collected, sent to a laboratory for testing, and then the result was reported – usually a week or more later. Over the years, NIOSH developed and has attempted to commercialize a Coal Dust Explosibility Meter (CDEM). The CDEM is an instrument used to assess the explosibility of coal dust in real-time. In June 2011, a commercial manufacturer began production of the CDEM. This commercialization was preceded by extensive in-mine testing throughout the United States, which demonstrated the utility and accuracy of the device. Presently, some mine operators are beginning to use the CDEM to assess the explosion hazard and make adjustments in real time. NIOSH has drafted a report entitled "Coal Dust Explosibility Meter Evaluation and Recommendations for Application" and is planning to finalize it soon.

The personal dust monitor (PDM) is not only commercially available but is now certified in accordance with 30 CFR Part 74 (Coal Mine Dust Sampling Devices) as an approved dust sampling device – a prerequisite to its use in compliance monitoring. This device represents a significant advancement in the campaign to eliminate coal worker pneumoconiosis (black lung disease). Already some operators have begun to use this device, and limited NIOSH studies to

date find that when empowered with this technology, miners will use it to reduce their exposure to respirable dust.

The reduction of respirable dust in the production environment is as important as ever, and NIOSH has developed a best practices handbook and conducted several "train-the-trainer" workshops to disseminate these practices throughout the industry. At the same time, our scientists and engineers are studying new and potentially more effective technologies for further reducing respirable dust levels. The "canopy air curtain" for use on roof bolters, for example, envelops the operator inside a "canopy" of filtered air. If the in-mine trials are as successful as those in the laboratory, it will eliminate one of the highest respirable dust exposures.

Equipping miners with the knowledge, skills, and technology to escape successfully during mine emergencies is a continuing priority. NIOSH has developed training and technology in this area, and recently, we funded the National Academies to conduct a comprehensive analysis of self-escape in the context of mining safety. They will examine judgment and decision making under conditions of stress and uncertainty, essential competencies for escape, training methods to impart the skills needed to plan and execute an escape, and technologies that could improve the chances of self-escape, among others.

A few months ago, NIOSH researchers conducted a workshop with industry, labor, and government stakeholders from the metal/nonmetal and coal sectors to identify training successes and gaps, and to set priorities for improvement over the next five years. Recently, a set of training programs on the use of refuge chambers was completed. We are also seeking more effective ways to train miners, and over the past year we have adapted a 360-degree virtual reality theatre that we observed being used in Australia to train mine rescue teams. Building on their work, we are already developing advanced training simulations that will allow teams of miners to interact simultaneously. One of our initial efforts is focusing on means to train miners more effectively to escape under emergency conditions.

Of course, practices to prevent emergencies in the first place should be everyone's priority, and toward that end, NIOSH researchers have developed improved techniques to prevent mine explosions and roof falls, and we will continue to conduct research in priority areas such as methane flows into and out of gob areas of active longwall panels (mined out areas made up of caved in rock).

Since the passage of the MINER Act, NIOSH has awarded 94 technology development and research contracts, targeting innovations in communications and tracking, escape, rescue, sensory systems to improve hazard recognition, and prevention efforts with an emphasis in mine explosion prevention and fire suppression.

These efforts have produced several technological advancements that have significantly improved post-accident survivability, provided a framework to enhance detection of hazardous conditions as they develop, and aided in fundamental understanding of mechanisms that contribute to disastrous events, which are leading to enhanced intervention technologies and strategies to prevent their occurrence.

Prior to the MINER Act, communication in most underground mines was equivalent to a simple, land-line-style telephone system that was highly vulnerable to disruption due to local and large-scale mine catastrophes, such as explosions and ground falls. All mines now have installed some form of primary wireless, two-way communication, reaching to all locations within the mine with sufficient redundancy to enhance survivability in local-scale mine disasters. Secondary systems which require much less infrastructure have also been developed to enhance survivability in large-scale mine disasters. Commercially available systems include the medium frequency system and the Through-the-Earth (TTE) systems. "Gateways" have been developed to allow interoperability among these systems, and this provides for greatly improved post-accident survivability and functionality, even when parts of systems have been compromised.

Collaborations with the Navy, the National Aeronautics and Space Administration (NASA), the National Institute of Standards and Technology (NIST), and the Department of Energy (DOE), among others, are being used to leverage taxpayer investments in one agency to the solution of problems in another. Similarly, working collaborations are underway with mining safety and health agencies in other countries. For example, the Safety in Mines Testing and Research Station (SIMTARS), a mining safety agency in Queensland, Australia, and NIOSH are jointly developing a mine escape vehicle, which incorporates enhanced breathing capacity, communication, and guidance into a conventional mine transport vehicle. A prototype has been designed and built to provide life-support functions for 10 to 12 miners, operate in an oxygen-deficient, low- or no-visibility atmosphere, and travel at speeds faster than miners can walk out of a mine. Underground field trials of the prototype vehicle will occur later this fiscal year.

There are many examples to illustrate the mine safety and health improvements that are attributable to the research, development, and translating activities of NIOSH, as well as to the collaborations of NIOSH with MSHA and labor and industry partners. It is impossible to quantify how many disasters have been prevented and how many lives have been saved as result of the work of NIOSH and its partners at MSHA, labor, and industry. On the other hand, when something goes terribly wrong, the human cost is all too apparent – and then there is a responsibility to understand what went wrong and what needs to be done to ensure that it never happens again.

Following the explosion at Performance Coal Company's Upper Big Branch Mine South (UBB), which resulted in the death of 29 miners and serious injuries to two other miners, Hilda Solis, Secretary of the U.S. Department of Labor, requested that the Director of NIOSH identify a panel of individuals with relevant experience to conduct an independent assessment of the MSHA Internal Review (MSHA IR). Secretary Solis asked the UBB Independent Panel to assess the MSHA IR Team's processes, conclusions, and recommendations.

Dr. John Howard, the Director of NIOSH, appointed four experts in areas relevant to the MSHA IR Review and MSHA's UBB enforcement activities to serve on the independent panel. Members of the independent panel included Lewis Wade, Ph.D., (Chair); myself (Executive Secretary); Michael Sapko, M.S; and Alison Morantz, Ph.D., J.D. Susan Moore, Ph.D., of the NIOSH Office of Mining Safety and Health Research served as staff assistant and Recording Secretary. The Assessment produced is not a NIOSH publication. The views expressed by the

Panel members are their own professional views and not necessarily those of NIOSH, CDC or HHS.

In April 2010, Joseph Main, Assistant Secretary of Labor for Mine Safety and Health, instructed MSHA's Director of Program Evaluation and Information Resources (PEIR) to assemble a team to conduct an internal review of MSHA enforcement activities at UBB in accordance with applicable MSHA policy and procedures. The PEIR Director assembled a group of MSHA employees without current enforcement responsibilities in Coal Mine Safety and Health District 4 to serve on the MSHA IR Team.

Over a period of nearly two years, the MSHA IR Team reviewed thousands of pages of records on enforcement activities (including ventilation and roof control plans, correspondence files, handbooks, policy manuals, and enforcement inspectors' notes) and interviewed 87 MSHA employees.

In June 2010, the independent panel met with the MSHA IR Team for the first time. Over the ensuing 18 months, seven follow-up meetings took place via conference call between the MSHA IR Team and the independent panel. At each of these meetings, the MSHA IR Team briefed the independent panel on its progress and consulted with the panel on specific methods being used to examine discrete aspects of MSHA's actions or inactions prior to the UBB explosion. Meanwhile, the independent panel periodically asked the MSHA IR Team to provide it with specific documents, including prior MSHA Internal Review Reports, Internal Policy and Procedures, and the Ventilation Plan Approval Handbook. The independent panel analyzed all materials that it received from the MSHA IR Team, including reports from internal reviews that MSHA had conducted in the wake of earlier mine disasters from 2001 onwards.

On January 11, 2012, the MSHA IR Team provided NIOSH with a draft report and requested the independent panel's views about the report. On February 3, 2012, the independent panel conveyed its comments to the MSHA IR Team. On February 23, 2012, the MSHA IR Team provided its final IR report to the independent panel.

MSHA's Administrative Policy and Procedures Manual, Volume III, Section 1200, entitled "Internal Review Policy and Procedures," establishes the objectives, responsibilities, and procedures for conducting an internal review of an incident in an underground mine resulting in three or more fatalities. The independent panel assessed the MSHA IR process, conclusions and recommendations against this policy.

The independent panel prepared a report that summarizes its assessments of MSHA's Internal Review, and specifically the processes it used, its conclusions, and its recommendations. Further, the independent panel report provides a set of recommendations that it believes will lead to a lasting improvement in MSHA's enforcement performance.

I appreciate the opportunity to testify this morning and thank you for your continued support. I am pleased to answer any questions you may have.