

Statement of
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Committee on Education and Labor
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Good morning Mr. Chairman and other distinguished members of the Committee. My name is Larry Grayson. I am the Union Pacific/Rocky Mountain Energy Professor of Mining at the University of Missouri-Rolla and Director of the Western U.S. Mining Safety & Health Training and Translation Center. Having been a coal miner myself for nine years, I very much appreciate the opportunity to address the Committee today concerning mine health and safety issues and the effectiveness of MSHA's mine safety and health programs.

Based on my experience in underground coal mining, as a professor who focuses on mine health and safety issues, and as a former Associate Director of mine health and safety research in NIOSH, I am here hopefully to help you evaluate the effectiveness of MSHA's mine safety and health programs. My insights on this topic have been sharpened dramatically in the last year since the mine tragedies at the Sago, Aracoma/Alma, and Darby mines compromised a dramatic legacy of improvements in mine safety. These insights were particularly honed through my interaction with mine safety and emergency response experts who served on the independent Mine Safety Technology & Training Commission (hereafter referred to as the Commission), which was boldly established by the National Mining Association.

During the course of the study, it became clear to the Commission that the mine safety record regarding underground coal mine fatalities resulting from fires and explosions dramatically changed from the period 1993-1999, when no such fatalities occurred, to the period 2000-2006, when the awful toll increased to 37. This latter number comprises 40% of such fatalities over the past 23 years, and returned the incident rate to over 6 per year, nearly the same rate during the period 1984-1992. No single factor can account for the dramatic rise, but rather myriad parameters led to it.

The Commission's initial focus was on making recommendations to increase the chances of miners to survive mine emergencies. Accordingly, in the report¹ recommendations were made relative to communications technology, emergency response and mine rescue procedures, training for preparedness, and escape and protection strategies; however, the Commission noted the need for a fundamental change in the way mines address their major hazards. In this respect the Commission recommended that risk-based design and management of major hazards are necessary processes for underground coal mines to

¹ The Commission report can be found at: <http://www.coalminingsafety.org>

effectively prevent mine emergency situations. History and experience clearly indicate, in numerous situations and conditions encountered, that often minimum compliance with regulations is not sufficient to deal with major hazards such as fires and explosions. The Commission noted further that the level of risk from such hazards is mine specific, and interventions to effectively mitigate or eliminate the threats of such major hazards must be determined by a thorough risk analysis leading to a management plan implementing the interventions. This process should be done by every underground coal mine in the U.S., because of the significant threats, and management must involve all workers in preventing accidents and injuries. Establishing a culture of prevention is necessary for us to achieve the goal of zero fatalities.

I will now focus on MSHA and give my assessment of the agency's effectiveness in improving mine safety and health in the U.S. First without doubt the agency has played a major role over the past 37 years in improving the safety of miners. Statistics bear this out. MSHA inspectors provide 'extra sets of eyes' to help spot problems in a mine, and I have personally regarded their efforts as very helpful. Some underground coal mines can be very expansive spatially, comprised of extensive infrastructure spread throughout miles and miles of tunnels, both of which can deteriorate over time. Good examinations by mine examiners can help spot developing problems, especially the more visible ones, but many other problems develop much more insidiously, and well trained inspectors are adept at finding such insidious problems earlier. We owe a great debt of gratitude to our mine inspectorate, and their day-in and day-out efforts are critical.

The focus of MSHA's internal policies and practices does change over time, particularly as key personnel change. Consistency of enforcement, including the assignment of the S&S designation, is sometimes problematic among districts, mines, and inspectors. The current attrition and loss of experienced inspectors will only exacerbate this situation, unless close attention is given and proactive action is taken to minimize the effects. The scrutiny of mine inspectors is critical to ensure the overall safety of mine operations, just as is the scrutiny of mine examiners at their mines. Lack of attention to details can spell disaster, as we have seen from last year's tragedies.

An example of this lack of attention to detail by mine managers is manifested by the situation that developed at Jim Walter Resources Mine No. 5 in 2001, when 13 miners died. An analysis of violations and reportable accidents for that mine shows that a number of leading indicators of potential disaster did exist. Specifically, the mine had only one reportable ignition in 2000. The first ignition at the mine in 2001 occurred on May 17th, and then a second occurred on August 30. This was not particularly noteworthy in an experienced miners' mind. However, two additional ignitions occurred in September, just prior to the explosions on September 23rd. The latter two ignitions in quick succession following the one on August 30th should have rung a clarion call for immediate scrutiny of potential for danger.

To carry the example farther regarding lack of appropriate attention to details by MSHA, the Jim Walter Resources No. 5 Mine received 1,489 citations from January 1999 until the explosions occurred in 2001. Of these, citations for ventilation (329), accumulation of combustible materials and rock dusting (288), and roof control (112) accounted for 49% of the total. The percent of them that were designated as S&S were 14.6%, 19.8%, and 64.3%, respectively. Over the same period, five withdrawal orders were issued concerning ventilation, eight relative to combustible materials and rock dusting, and one regarding roof control. Importantly, each of these critical areas was related to the explosions that occurred on September 23rd and the spatial extent of destruction.

There was significant evidence, in my opinion, that greater scrutiny of the safety performance at the Jim Walter Resources No. 5 Mine was justified. The sequence of events involving unsafe conditions and unsafe acts could have been interrupted, thereby preventing the fatalities. Unsafe conditions included the bad roof area, the occluded methane, the local explosion, disrupted ventilation, and accumulation of methane from the face areas toward the mouth of the section. Unsafe acts included leaving the charger near the bad-roof area, allowing the miners to stay in the mine after the first explosion, not removing the power from the haulage block system, and allowing the miners to return to the area of the first explosion. A simple action to move the charger away from a high-risk, bad-roof area could have interrupted the sequence of events and prevented the explosions. This case study shows the distinct value of analyzing high-risk situations and then taking action to mitigate or eliminate a potential sequence of activities from reaching fruition.

I also believe that there were many warnings of potential disaster involving sealed, abandoned areas of mines. As I noted earlier, there were no fatalities because of fires and explosions from 1993 through 1999, and we all thought that the trend would continue. However, during this period there were seven incidents of explosions in sealed, abandoned areas in mines. We were fortunate that the incidents did not result in fatalities, but simply ignoring what was happening was, in retrospect, not wise. I know work was done to decipher the causes of these explosions, and we understood the reasons, but we didn't go the next step to deal with the conditions under which seals were compromised and to prevent damage from such explosions. Very tragically, we paid the price for the lack of scrutiny in 2006. I am convinced that a systematic approach to risk analysis of these situations would have detected the vulnerabilities, and a game plan toward prevention could have been started in 1996 after three or four of these events occurred. In my opinion, it is the responsibility of MSHA to initiate such scrutiny and follow-up action.

Many mines do not perform at an acceptable level of safety. It is appropriate, in my thinking, to target high-risk mines deserving heightened scrutiny and concomitant enforcement without sacrificing adequate inspection of all mines.

However, such targeting must be objective and based on a sound risk-analysis process, fair to all types of operations, and designed to address major hazards quickly. I believe MSHA is headed in this direction, and I urge the agency to do it soundly and fairly. The U.S. mining industry should be the global leader in mine safety and health.

As we have become painfully aware from the tragedies in 2006, it is critical that a technology scan be done periodically to continuously seek improvement of the level of protection of miners to a higher level, thereby increasing their odds of survival dramatically in an emergency. It is imperative that this be done proactively, and it is recommended that an independent group of safety experts, including some from non-mining disciplines, should comprise a technology committee charged to do this. The agency to which the committee reports does not matter, as long as the committee functions independently.

Investigations of incidents with four or more fatalities should not be managed by MSHA, in my opinion. There will be an innate conflict of interest in some cases, and in other cases MSHA needs the separation from unpopular conclusions in order to preserve the perception of objectivity. It is in the agency's best interest to have an investigative board established, so that investigation can be done independent of the agency's influence.

The time has arrived for MSHA to accelerate the approval and certification of technology and equipment approved according to high international standards for permissibility and intrinsic safety. The agency knows which standards meet or exceed their own standards, and liability issues should be removed quickly to facilitate this.

As this point I am obligated to note that moving identified technology toward implementation in mines is not generally an easy task. We cannot allow the adoption of new technology without ensuring that it will work in the underground coal mine environment and not fail in times of critical need. Miners must be assured that they will be protected 'as advertised' and will never again be in situations that reveal false expectations about technology. The key is to identify needs early and pursue new technology proactively. From my own experience, I can share a technology research project that will illustrate the problem of trying to move too quickly to implement a new technology.

When I first joined NIOSH in 1997, an ongoing multi-year project was the development of a machine-mounted, continuous, respirable dust monitor (MMCRDM). The targeted technology for eventual implementation was the tapered-element oscillating microbalance (TEOM). The technology was used in other industries to monitor dust or particulate matter accurately, and it was selected as the best technology for innovative application in measuring respirable coal mine dust levels continuously. After about 5 years of research, the developer of the MMCRDM was able to demonstrate its accuracy in a housing

that was appropriate for application in an underground coal mine. The next step was to test the new technology for accuracy against the dust sampling device commonly used for compliance purposes by MSHA and mine operators. Eventually and reasonably quickly, the accuracy was confirmed. The next step was to test the ability of the new technology to withstand the rigors of the underground mining environment. Lab testing was the first step in doing this, according to a partnership-based research protocol, where the machine would be subjected to vibration and water droplet levels expected in coal mines. In this stage, any problems detected would result in modification of the machine to improve its robustness. Following success in this stage, in-mine testing of a prototype or a few prototypes would be done next, to validate the robustness in the mine environment. Unfortunately the machine was moved too quickly to the in-mine testing stage, bypassing the planned lab testing and early field testing, and multiple units failed miserably upon implementation for demonstration purposes. The technology now forms the basis for the personal dust monitor (PDM), which is near final approval following successful field research. It has taken over six years to reach this stage after I left NIOSH, but we will be able to rely on the accuracy, robustness, and utility of the PDM to protect miners from dust diseases of the lungs.

I would be remiss if I did not speak on MSHA's behalf concerning the impediments the agency faces in moving technology, procedures, policies, and rulemaking along more quickly. The U.S. government was established originally with an intricate system of checks and balances placed on its activities, involving each branch of government. In rulemaking, the process requires input from stakeholders. The stakeholders also have access to legal challenges when strong disagreements on direction occur. This intricate, balanced system ensures that prudent laws, regulations, and decisions are achieved in the end, while involving those most impacted by the proposed measures. Implementation of many provisions of the MINER Act must also undergo this process of public input and interaction with MSHA to move the laws into rules. Although it is very frustrating that the desired protections are not yet in place, and danger from fires and explosions still exist for underground coal miners, MSHA has been following the required process for most provisions. Why certain provisions of the MINER Act were not pursued in the past or not done more quickly is problematic, for example, concerning development of seal construction criteria in light of past explosions in abandoned areas and evaluation of the protections afforded by rescue chambers.

Finally, I admire our coal miners more than I can say, and I affirm that we must provide them a workplace, in often threatening conditions, that will protect their lives and livelihoods while also assuring a retirement free from disability. Our nation has a growing dependence on a tremendous natural resource, which will provide stability in our continued economic development, and we need courageous young men and women to step up to meet the challenges of coal mining. Let us remove the life-threatening vulnerabilities that have been

identified in 2006, look proactively for those yet unidentified, and build a risk analysis-based culture of prevention that will not leave any stone unturned to address the major threats.

I appreciate the opportunity to address you, and I will try to answer any questions you may have.