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Mine Safety and Health Administration

The Alpha Foundation

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“Research and Development of Technologies to Improve Mine Safety and Health”

Thank you for your work and for the opportunity to speak with you today on this important topic. It is my view that the United States should be the world leader in research and development of technologies, systems and processes that improve mine safety and health. I think many would agree that in the recent past our country had to look at progress in other countries to solve some of our problems. I believe however that we are changing that approach and are again on the path of becoming a world leader, looking ahead to develop new technologies, albeit at times driven by past mine disasters.

I also believe the Foundation created as part of the Department of Justice non-prosecution agreement with Alpha Natural Resources, Inc., following the April 2010 Massey Energy Upper Big Branch coal disaster can be a catalyst to bring about safety and health improvements. I want to thank Booth Goodwin, Steve Ruby and others for the foresight to bring this about. There has been progress during the past few years, and more needs to be done.

I know many ideas will be raised at this conference on ways to improve mine safety and health. The mining industry needs this opportunity to have a dialogue about those ideas and to look at ways to apply resources to those ideas to make those improvements happen.

I believe we are moving in the right direction. I also know we all agree that more needs done. You can see the progress we have

made through the 2011 year end mining fatal and all injury rates, which were the lowest in recorded history. The mining industry fatal rate was .0114, and the all injury rate was 2.73 reported injuries per 200,000 hours worked, with the most improvement last year in the metal/nonmetal sector.

We can bring these rates even lower by focusing on the causes of mining deaths. Last year in coal, 8 deaths were caused by machinery; 5 resulted from falls of face/rib/highwall; 4 from powered haulage; 1 from an electrical accident; one from a fall or slide of material; one from a fall of roof or back; and one when a miner slipped or fell. In metal/nonmetal, 4 deaths resulted from powered haulage accidents; 3 from machinery; 3 were slips or fall of a person; 2 occurred in a fall of roof or back; one was electrical; one was explosive and breaking agents; and one from a fall or slide of material. We need to focus more on how we can prevent those.

In January 2010, we launched the Rules to Live By program which identifies and targets the most common causes of mining deaths. Rules to Live By I – “Fatality Prevention” was followed by RLB II – “Preventing Catastrophic Accidents” and RLB III “Preventing Common Mining Deaths.” The initial Rules to Live By initiatives identified the most common causes of mining deaths over a 10 year period and the Title 30 CFR standards associated with them. There were 28 coal standards and 19 metal/nonmetal standards identified in the three RLB initiatives. If we are to prevent these common mining deaths we must focus more attention on these standards and the types of conditions associated with them.

We also need to focus attention on the more serious injuries. Last year there were 2,996 non-fatal days lost injuries in coal and 2,819 non-fatal days lost injuries in metal/nonmetal reported. The serious injuries in both coal and metal/nonmetal occurred in the categories of handling of materials, slip or fall of person, and

powered haulage. Solutions on how to prevent these deaths and injuries should be a priority consideration.

In terms of research and development, work and progress already has begun on several issues, with more to be done. Over a decade ago, a number of us began work supporting development of a technology to continuously monitor respirable coal dust and measure the dust levels in real time by a device miners could wear, the Continuous Personal Dust Monitor (CPDM). The first final rule I issued on April 6, 2010, as Assistant Secretary was approval of the CPDM that was a result of that work. While not yet a regulatory requirement to use the device, a number of mine operators are using it as an engineering tool to sample respirable coal dust in real time.

Another issue looks at how to prevent miners from being killed by moving equipment in underground mines. Since 1984, 77 deaths have occurred that could have been prevented with proximity

detection devices. In coal, 72 miners have been killed, 32 by continuous miners and 40 by other mobile equipment. In metal/nonmetal, 5 miners have been killed, one by a continuous miner. We began work a decade ago on development of a technology that would prevent miners from being crushed by continuous mining machines in underground coal mines. The focus was on a technology that would have the large mining machine detect the presence of a miner too close to the machine and shut down the machine before it came in contact with the miner. As a result, proximity detection devices have been developed and are now on 161 continuous mining machines protecting miners from crushing injuries. While Alliance Resource Partners led the implementation of this device, others have followed. Companies including Consol Energy and Peabody Energy have led the way to advance that technology in the US, and apply it to other underground sectional mining equipment such as scoops and shuttle cars. It should be recognized that South African mines are well ahead of the US, with these systems

in place. However, research and development are underway ahead of regulatory actions which will aid in the ultimate implementation of the devices.

Years ago, work began to develop a device that would allow immediate sampling of mine dust to determine its explosibility. NIOSH led the work on this. That resulted in development of the Coal Dust Explosibility Meter (CDEM). In August 2011, that new tool became commercially available and as we examine its use, companies like Alpha and Consol Energy are using it to better monitor coal dust to meet compliance levels. As we develop strategies to apply this technology, we will all learn from their experiences.

Very important work is also underway to tackle other technologies to improve mine safety and health that also needs more attention. This work includes: development of improved atmospheric monitoring systems that would provide instant information at

strategic locations during normal mining operations, and be operational during a mine emergency following a mine event such as a mine fire, explosion, inundation or ground failure; development of improved communication systems, such as through-the-earth voice communications, and communication systems that will link mine rescue teams directly with the control and command center; electronic systems that will provide instant information on mine rescue explorations; improving seismic capabilities to better detect miners who may be trapped or lost underground; and building upon the latest breakthrough of through-the-earth voice technology are other issues that need more attention. We also need to develop better mine rescue models and provide improved training for rescue teams, command and control, and responsible persons at mines on new procedures and equipment that will be coming on board shortly. All of these I just described need more development and work to be effectively applied.

In addition to looking at all of these technologies and encouraging more work to flesh out practical applications of these technologies, we are focusing on others as well.

We are examining how best to provide the protective benefits Congress intended with regard to the type and application of refuge alternatives in underground coal mines, along with overall escape protections, including oxygen support during escape. Refuge alternatives have been in use in U.S. coal mines for almost five years now and, MSHA and the State of West Virginia have addressed issues related to the use of components for refuge alternatives. Soon, MSHA plans to issue a Request for Information (RFI) seeking data and comments on issues and options relevant to miners' escape and refuge that may present more effective solutions than the existing refuge alternatives rule during underground coal mine emergencies. Responses to this RFI will assist the agency in determining if changes to existing practices and regulations would improve the overall strategy for

survivability, escape, and training to protect miners in an emergency.

Miners' exposure to noise, which can and does result in the loss of hearing, continues to be an area of concern. We all need to look at ways to reduce noise levels at the source in the workplace. In coal, the most commonly cited sources of noise are continuous miners, roof bolting machines, and bulldozers. In metal/nonmetal noise sources needing attention include: jet piercing channel operator, continuous miner operator and drill operator, jackleg/stoper.

With accident reports identifying deficiencies in training, and concerns about miners' reluctance to report unsafe or unhealthy conditions as reflected by the Upper Big Branch tragedy, an area of focus could be research to determine effective methods of training miners to recognize hazardous conditions and the

importance of knowing and exercising their rights under the Mine Act.

Another area involving occupational health includes better protecting miners' exposure to exhaust contaminants and its effects. Research and development needs in this area include: evaluating exhaust contaminant load based on engine and use in work areas and airways for both surface and underground coal and metal and nonmetal mines; and evaluating miners' health at mines with a history of diesel equipment use for adverse health impact related to exhaust exposure.

There are reasons for focusing more attention on respirable dust control, including silica and other airborne contaminants at coal and metal/nonmetal mines. In addition to the development of better controls for mine dusts at their source, research and development could target develop of an instrument (like the CPDM) to continuously monitor and record miner exposure to

silica, diesel particulate, and other airborne contaminants; and develop machine-mounted instrumentation for collecting real-time data on dust suppression parameters (dust concentration, air velocity, spray pressure and flow, etc).

Two other issues specific to metal/nonmetal merit increased research and development. Those are use of a hazardous waste as a fuel, where we need to understand how to protect miners from the health effects of burning hazardous waste; and mining of rare earth minerals, where further evaluation of the health and safety aspects of mining and milling rare earth metals is needed.

Jeff Kravitz will address some of the major mine rescue topics I touched on in more depth during his presentation.

As you can see, progress has been made, but there are a number of areas where research and development into new tools and processes can result in significant improvements to miners' health

and safety. I look forward to the beginning of this discussion and working to continue these efforts to protect miners' health and safety.