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Rapporteur's Report

Mining Sector

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1. Introduction

Mining provides a large part of the energy and raw materials that feed this Nation's economy. Copper pipe, concrete, and window glass serve as well known examples of the reliance on minerals in modern society. Less appreciated, but as important, are the hundreds of mined commodities that are an integral and necessary part of everyday products, ranging from medicines and computers to carpet and paper. Coal is a major portion of the country's energy mix today, as it will likely continue to be in a future hydrogen-based economy. The domestic mining industry also provides strategic minerals that are important for the Nation's security.

The processes to recover these mineral commodities are among the most demanding and complex in an industrial society, and this inherently dangerous industry has historically had the highest risks of fatality and injury.

The mining industry has been undergoing some trying and challenging times because of the recent mine disasters in the coal fields. These events have been alarming in light of the strong and encouraging safety record that has characterized mining in the United States for most of the past decade. While mining communities deal with their grief, mine operators, government regulators, and other safety personnel, set about trying to determine why these fatalities occurred. Subsequently, the mining industry is currently experiencing changes in legislation at an unusually rapid pace. The most recent regulatory changes are the Mine Improvement and New Emergency Response Act of 2006 (MINER Act) and the temporary emergency standard for mine seals. The new mine safety laws call on the nation's mines to adopt certain procedures and safety technologies immediately, or as soon as they become commercially available. Putting all the provisions in place from these new laws is a major undertaking, and will necessitate strong collaborations and partnerships among mine operators, manufacturers, regulatory and research agencies, labor unions, and community groups. It is against this background that Prevention through Design (PtD) components for the Mining Sector are recommended.

The mining sector breakout session workgroup discussed the mission of the PtD workshop and the role of the four functional areas: practice, policy, research, and education. The participants agreed on specific research areas where additional mining stakeholder collaborations and PtD applications were greatly needed. They included the following: health standards (in particular, the newly proposed coal mine dust standard), disaster prevention, and mine emergency response. These areas of interest are greatly affected by the new or proposed mining legislation.

2. Most Compelling Idea/Recommendation to Come Out of the Discussions

The most compelling PtD recommendations for the Mining Sector include:

- The need to develop and maintain a mechanism for the sharing of effective PtD practices
- The development of financial incentives to initiate PtD programs
- Improved injury and illness surveillance by the Mine Safety and Health Administration (MSHA) and mine operators to increase the understanding of the nature and root cause of accidents, injuries, and illnesses
- Many of the current mining textbooks are outdated, sometimes out of print and do not incorporate PtD principles to any large extent. Therefore, there is a great need for academia to develop new text books and coursework to be incorporated into the class curriculum.

3. Practice (Needs, Challenges, Opportunities)

First, and foremost, is the strategy to create stronger and more effective collaborations and/or partnerships for data sharing and research development within the mining industry. The National Institute for Occupational Safety and Health (NIOSH) National

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Occupational Research Agenda Mining sector has been one of the leaders in this area, but the group agreed that more involvement and communication is needed. It was also agreed that the sharing of good practices through partnerships and collaborations will only be beneficial if there is involvement and guidance from international mining professionals.

It was agreed that better injury and illness surveillance by the MSHA and mine operators is needed to increase the understanding of the nature and root cause of accidents, injuries, and illnesses. Improved surveillance will help better identify problem areas and determine the needs of the stakeholders. If more specific injury and illness data become available, mine equipment manufacturers and mine operators can incorporate these data into a design and risk management program.

A weakness in marketing research and development successes to stakeholders arose as a barrier to the PtD initiative. NIOSH should do more to promote and disseminate research advancements through the health communications functions and the Research to Practice initiatives. This can also be accomplished by better utilizing the communication pipelines through collaborations and partnerships. In addition, the mining community (in particular, mine operators and equipment manufacturers), has been very resourceful and creative in developing many PtD designs and products. It was voiced that not only should NIOSH investigate and test these initiatives, but also market and disseminate the PtD successes of the mining community, NIOSH, and others.

Another barrier to the PtD initiative is the financial disparity between large and small mines. Initiatives need to be created where alternative designs and products could be developed that are more affordable for smaller mines. A final barrier, agreed upon by the group, is that the mining safety and health culture needs to change from reactive to a more preventive and risk management type of safety culture.

4. Policy (Needs, Challenges, Opportunities)

In general, the group agreed that a drawback of the mining regulatory process is that it often takes a minimum of two years, if not longer, to change regulatory provisions. But contrary to the historical law-making process, the current fast-moving legislation and policy changes have created increased demands for all involved, including regulators, researchers, equipment manufacturers, and mine operators. Some participants expressed a perception that rule-making has become somewhat guarded and not performed in open forums, as it had been previously.

It was agreed that financial incentives to develop and implement PtD designs/products will help stakeholders meet the requirements of the regulatory changes. Some examples are the increased use of NIOSH Cooperative Research and Development Agreements and financial incentives by Congress, to develop and incorporate PtD research successes into the mining industry. Currently, there are no financial incentives in the mining industry for PtD initiatives set forth by the government.

Another suggestion was that NIOSH become more involved in the cost/benefit analyses of PtD designs and products. Historically, NIOSH has not been involved in research in this capacity, but changes to policy can allow NIOSH to get more involved in the financial end of the PtD initiative. Showing the financial benefit of PtD implementation will strengthen the marketing of it.

Finally, it was noted that regulatory agencies (state and federal) have a major influence on PtD initiatives. If these agencies get involved in the PtD process from the inception, there is a greater chance that PtD initiatives will get accomplished. Furthermore, collaborations with European and Australian regulatory agencies, which currently have regulatory standards that focus on equipment design and risk management, could help guide the United States agencies to develop similar regulatory standards.

5. Research (Needs, Challenges, Opportunities)

One major area where improvement is needed is in surveillance of injuries and illnesses, as mentioned earlier. There are data gaps that can be reduced by better data reporting and analyzing. Along with MSHA, mine operators should be encouraged to improve their health and safety data reporting, to determine areas where PtD initiatives could help and serve as a risk management tool.

Also as mentioned earlier, PtD designs and products developed by all stakeholders can be tested and assessed by NIOSH. A potential outcome from this can be the formulation of a "Good Practices and Recommendations for PtD" handbook for stakeholders. Again, a driver to further the PtD research initiative is the formulation of partnerships and collaborations in the United States and abroad.

6. Education (Needs, Challenges, Opportunities)

The group agreed that students entering into the mining industry (e.g., engineers, business students, law students, safety personnel) will benefit greatly from education on the advantages of PtD. Furthermore, there is also a need to educate all stakeholders (regulators, mine operators, equipment manufacturers, labor unions, etc.), not only college students.

Additionally, there is a lack of new mining text books. Many of the current books are outdated and sometimes out of print. In addition, there are no known mining text books, specialized class courses, or course curricula that incorporate PtD principles into their books or lesson plans at any capacity. Therefore, there is a great need for academia to develop new text books and coursework to be incorporated into the class curriculum. The proposed "Good Practices and Recommendations for PtD" handbook may serve as a good resource.

Finally, it was mentioned that educators and students should be involved in the stakeholder mining collaborations and partnerships. By doing this, students can be involved at the inception of the PtD initiatives, and follow them through until the end. Summer internships to get involved in these initiatives should be promoted.

7. Discussion

In conclusion, the general consensus from the members of the mining sector established the need for several key endeavors.

More and stronger mining collaborations and partnerships need to be established among stakeholders, as well as the international mining community. Communication and marketing of PtD strategies, designs, and products should be improved. Regulatory agencies need to be involved early in the PtD process. And finally, there is a great need to educate mining stakeholders and students, from the undergraduate level and up, about the benefits of the PtD initiative.