2:45 PM

Mining Safety; Sharing Solutions

B. Ross; Geotechnical Center of Excellence, University of Arizona, Tucson, AZ

The experience of the mining industry has been that, for various reasons, safety experience and innovations of one company have not been shared with others in the industry. The James E. Rogers College of Law's Third Annual Mining Law Summit, entitled "Mine Safety; Sharing Solutions" addressed this issue by reviewing a recent example of sharing learnings from the Bingham Canyon landslide, looked at the authority of the Mine Health and Safety Administration and experiences with self-audits and information sharing as well as having a panel discussion to illustrate the implementation of collective expertise in addressing a hypothetic mine disaster. The Summit concluded with a review of methods to providing mine safety expertise and a proposal for providing future mine safety assistance. This presentation will provide valuable insights into sharing safety solution and considerations for future policy initiatives based on learnings from this summit.

3:05 PM

Safety Controls for Leach Stockpile Gas Generation

B. Varela, P. Cook and S. Johnson; Freeport-McMoRan, Tyrone, NM

This paper discusses the hazardous gas potential on leaching stockpiles and focuses on the critical controls needed to protect personnel. The generation of hazardous gas on a copper leach stockpile in 2014 led to a sampling campaign and investigation that identified the potential for NO_x exposure to personnel from the dilution of sulfuric acid. Further testing has shown SO_2 evolution to be a regular occurrence during sulfuric acid dilution. Potential gas exposures downstream from sulfuric acid-carbonate mineral interactions are discussed, as well as the physical transport mechanisms through a leach stockpile. Associated controls for both reaction pathways are included.

3:25 PM

Safety Culture and High Reliability Organizations: Convergent Approaches for Smarter Mine Safety Management

M. Pillay[1] and M. Tuck[2]; [1]School of Health Sciences, The University of Newcastle, Callaghan, NSW, Australia and [2]School of Science, Engineering and Information Technology, Ballarat, VIC, Australia

Mining is an important contributor to the social and economic fabric of many developed and developing countries. However, it continues to be regarded as one of the most hazardous industries because of the industry's inability to achieve zero harm or sustain high levels of safety performance. In addition, fatalities and serious incidents in the industry continue to be attributed to the same factors, suggesting that the sector is failing to learn from lessons of the past, or on emerging theory on organizational performance. More innovative solutions are required. Since the 1980s safety culture and high reliability organizational approaches have been part of the safety management arena, but which have yet to be seriously embraced by many mining companies. This paper reviews and synthesizes published literature on these strategies, with the aim of identifying opportunities they provide for smarter mine safety management

3:45 PM

The Role of Supervisory Support in Fostering a Positive Safety Culture That Enhances Workers' Performance

E. Haas; CDC National Institute for Occupational Safety and Health, Pittsburgh, PA

Leadership is part of an organization's safety culture and influences how H&S is enacted on site. Worker perceptions of management are shaped through consistent leader-employee interactions; however, little is known about the communicative support (emotional, informational, and tangible) offered by supervisors and its impact on workers' H&S outcomes. Using pre- and post-interview data with 20 supervisors and 48 workers, researchers identified positive and negative instances of supervisor support. This presentation highlights common support tactics offered by supervisors and desired by workers to help practitioners identify ways to improve their safety culture and subsequently, the performance of their workforce.

4:05 PM

The Steps to a Successful Safety Culture Transformation

C. O'Brien; Kiewit Mining Group, Englewood, CO

The only SMART MINING is mining done safely. Kiewit Mining has experienced a dramatic shift in safety results by the successful transition from a compliance-based to a behavior-based safety program. Kiewit has learned that using "safety cops" to enforce company standards leads to standards being ignored when supervision is out of the sight. Safety improvements resulted from Kiewit's safety programs being ran by the miners. Within Kiewit, this team is called CVIS, which is an acronym for the Craft's Voice in Safety. This team is empowered to bring up safety issues, solve problems, and communicate safety concerns directly with the Mine Manager and their fellow miners. This fosters an environment where a transformation in safety culture can occur because people giving and taking constructive criticism about their safety behavior is accepted and embraced. With this safety culture, there is a whole team looking out for safety, not just one person. Safety is a never-ending journey, but progress can be made and results improved with a behavior-based safety program.

4:25 PM

Assessing the Quality of Incident Investigations and Its Effect On Safety Performance of the Ghanaian Mining Industry

E. Stemn[1], D. Cliff[1], M. Hassall[2] and C. Bofinger[1]; [1]Mineral Industry Safety and Health Centre, Sustainable Mineral Institute, The University of Queensland, Indooroopilly, QLD, Australia and [2]The School of Chemical Engineering, The University of Queensland, St Lucia, QLD, Australia

This study examined the content of past incident investigation reports to determine the quality of the investigations using a semi-quantitative method. The assessment tool consists of 5 elements with several indicators and rating scales for assessing the quality of an investigation report. The method was applied to 304 investigation reports of 3 Ghanaian large-scale mines, and the results correlated with incidence rates. Results showed that the mines differ significantly in the quality of their investigations, and the incidence rates negatively correlated with elements of the assessment tool. Overall, the method was found useful and revealed areas where improvement is needed.

TECHNICAL SESSIONS

MONDAY, FEBRUARY 25
AFTERNOON

1:30 PM | ROOM 113

Dreyer Lecture: Why Choose Industrial Minerals For A Career Path

Recipient and Lecturer: *Dennis P. Bryan*

MONDAY, FEBRUARY 25
AFTERNOON

2:00 PM | ROOM 507

Bulk Material Handling: Conveyor Maintenance and Safety

Chair: *N. Madison, Cornerstone Conveyor Engineering, Fayette, AL*

2:00 PM
Introduction

2:05 PM
Constructing Toromoch's 5.2 KM Conveyor through the Andes Mountains
C. Torres and E. Michiels; Maccaferri Mining Solutions, Lithia, FL

Constructing a 5.2 KM conveyor has many challenges, combine that with-building it at nearly 5,000m in elevation through the Andes mountains and it can be hazardous. Identifying the structure's best travel path still required a 250m climb, a 300m decent as well as 7 horizontal turns. This path still left the conveyor exposed to falling debris and ice, the construction of a 20m reinforced slope and a tunnel to allow vehicles to cross the structure. Construction at this elevation is challenging and the weather; wind snow and rain, can be create quite a burden on the installation crews. For the safety and construction timeline experienced crews were necessary to construct various aspects of this project. This presentation will share design and construction details on the rockfall protection system, the MSE wall supporting this massive conveyor and the tunnel on this project.

2:25 PM
Bulk Material Flowability Testing – What Is It and Why Does It Matter?
C. Hartford and T. Holmes; Jenike & Johanson, San Luis Obispo, CA

Bulk solids handling systems are often the weakest links in the process plant, and their performance can dictate the performance of the entire operation. Therefore, they deserve special attention. When designing a bin, hopper, transfer chute, or stockpile for a bulk material, it is critical to understand how the bulk solids will "flow" through the system. Flowability is a function of the material and the equipment handling it. A "free-flowing" material placed in poorly designed equipment may have difficulty flowing reliably. Similarly, a material that seems difficult to handle placed in the correct equipment may flow without a problem. When designing a liquids plant, the density and viscosity of a liquid is looked up or tested and used as a design parameter. With bulk solids, the design process is similar except the friction, cohesive strength, compressibility and sometimes permeability need to be measured for the material. It is important for these tests to be run at representative process conditions. Measuring flow properties and applying them correctly will reduce project risk and potentially save a significant amount of capital.