

3:05 PM

Self-Paced Working in the Mining Industry: A Challenge or an Opportunity?

P. Roghanchi; Mineral Engineering, New Mexico Institute of Mining and Technology, Socorro, NM

Mine workers complete tasks on a shift-by-shift schedule, therefore, there has historically been pressure by mine operators on workers to complete enough tasks to get to a certain point in the cycle of mining. However, with modern mining companies adopting comprehensive safety programs, safety goals now overpower production targets. The increasing level of mechanization also resulted in redesigned jobs that promote safety and self-care to the personnel. Still, the focus of these safety programs is mainly towards reducing injuries and preventing fatality without considering the individual differences. There are several personal factors including the state of health, state of mind, and level of awareness that affect an individual's response to a potential hazard. The self-paced workers are well-informed, educated individuals who can regulate their work-rate and is not subject to supervisor pressure. This paper highlights the challenges and opportunities of promoting self-paced working in mine environments. It is demonstrated that how self-pace working can reduce the risks associated with health and safety hazards such as fatigue, heat stress, lack of concentration, carelessness, etc.

3:25 PM

Challenges of Multi-Generational Safety Training

M. Reiher and K. Vault; Colorado School of Mines, Golden, CO

For the first time in history, today's workforce is comprised of five generations. Each generation brings to the table their own strengths, weaknesses and viewpoints that are seemingly very different from the next. Therefore, creating safety training programs that target and engage multigenerational learners is essential, but it can often be difficult as the way in which employees prefer to learn and communicate has changed. In this presentation you will learn about the different generations and what influenced them while learning strategies to engage multiple generations to create a safer work environment.

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Measuring the Effects of Active Learning on Health and Safety Training

L. Wilson¹, L. Brown¹ and R. DiBona²; ¹Lowell Institute for Mineral Resources, University of Arizona, Tucson, AZ and ²ASARCO, Kearny, AZ

For more than a decade, training practitioners have called for changes in the way new and experienced miners are trained. There is an increasing emphasis on active learning approaches, which better reflect the experiential processes by which adults learn most effectively, and a recognized need for better assessment of outcomes, both within the classroom and on the worksite. In this talk, we survey the components of a comprehensive active learning design plan, which include learning objectives, course outlines, media, and assessments developed in cooperation with industry and subject matter experts. As part of our data-driven approach, we are now evaluating the effects of our active learning modules on new miner and annual refresher training, focusing on the knowledge, skills, and abilities for hazards recognition and hierarchy of controls. Working with industry partners, over 500 mine workers have participated in our study; treatment groups received training via active learning while control groups used traditional didactic approaches. We discuss initial results on training transfer, with insight on learner motivation, self-efficacy, and commitment to goals.

MONDAY, FEBRUARY 25

AFTERNOON

2:00 PM | ROOM 110

Industrial Minerals & Aggregates: Fracking Materials

*Chairs: B. Elliot, University of Texas at Austin
L. Moore, ArrMaz, Mulberry, FL*

2:00 PM

Introduction

2:05 PM

Are You in Compliance with OSHA's Silica Rule?

T. Thorn² and J. Suldickas¹; ¹Global Process Consulting Group, ArrMaz, Lakeland, FL and ²Oil & Gas, ArrMaz, Mulberry, FL

In accordance with OSHA's respirable crystalline silica rule, companies operating across the hydraulic fracturing supply chain are required to implement engineering controls to reduce worker exposure to silica dust. Have you properly evaluated and implemented engineering controls? This presentation will discuss: 1. Compliance requirements for organizations across the hydraulic fracturing supply chain 2. The potential cost of non-compliance 3. Important criteria that must be considered to effectively evaluate the different engineering control options available today aside from meeting the permissible exposure limit (PEL) 4. Review of a Case Study

2:25 PM

Permian Basin Frac Sand: A Case Study for Unprecedented Industry Growth

B. Elliott; Bureau of Economic Geology, University of Texas at Austin, Austin, TX

The frac sand industry continues to grow and develop in the Trans-Pecos region of west Texas, facilitating the frac sand needs of the Permian Basin. The "Kermit" or "intra-basin" sands represent a virtually untapped resource in west Texas, which had been avoided in the past, due to the typical age and frac sand properties that industry traditionally sought. The frac sand development is expected to grow as Permian Basin oil and gas activity ramps up. In addition to frac sand needs to facilitate frac jobs across the Midland and Delaware Basins, the economics of the distribution of frac sand resources (from both interstate and intrastate resources), mode of transportation, water availability and environmental issues, transportation logistics and availability, storage considerations, and resource competition are all factors that will affect the projection of frac sand resource and continued economic development.

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Physical Properties and Characteristics of Permian Basin Frac Sand: When Is Frac Sand "Good Enough"?

B. Elliott; Bureau of Economic Geology, University of Texas at Austin, Austin, TX

The "intra-basin" sands of west Texas could very soon become the largest frac sand producing region in the world, from a non-producing region in just three years. Proppant per frac job has been increasing over the past few years, the industry has shifted toward finer frac sand products than was being used a few years ago, the length of lateral wells requiring fracturing has increased and the total number of wells are increasing with the Permian Basin expected to be a significant consumer of frac sand over the next five years. The abundance of finer mesh products and the reduced delivered cost makes the Permian Basin sands a very attractive and cost

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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 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.