Cutter Bit Performance

Creating mining curriculum for university education

Mining is one of the major industries and largest employers in Saskatchewan. Many people who work at Saskatchewan's mining companies are also educated locally, at one of Saskatchewan's many post-secondary institutions. One of the goals of IMII is to facilitate alignment between the mining industry and these educational partners. With this in mind, the University of Saskatchewan proposed a project to develop course materials specifically relating to the mining industry, around cutter bit performance. Cutter bits, the teeth on mining machines that cut the ore away from the rock face, are a critical mechanical component in mining and are typically used in underground potash and uranium mines

Staff at the College of Engineering at the University of Saskatchewan developed course materials about the mechanized cutting machines used in Saskatchewan's potash industry. Cutting machines, which include road headers, continuous mining machines and drum miners (pictured) are used for shaft sinking, mining (removing raw ore from the mine face), and rehabilitation (fixing problems)/construction (building underground roads and rooms). The developed course materials related the different kinds of cutting equipment to the different conditions the machines may encounter (for example, ore composition and mine environment) to cutter bit performance. The project's industry partners, Nutrien, Mosaic and BHP, provided materials to use for teaching, including used cutter bits, potash ore samples, data and on-site tours. Prairie Machine and Bit Services also contributed information on the history of cutting machines to the training materials.

Drum miner. Photo courtesy of Nutrien.

The training materials and developed lectures were first used in 2019 in the college's "Drill Blast and Excavate" (GEOE 430) class. The cutter bit performance training was well received, and the college and Saskatchewan Polytechnic will continue to use the materials and lectures in the future.

Principal Researchers, University of Saskatchewan:

- **Doug Milne**
- **Donna Beneteau**
- **Jocelyn Peltier-Huntley**

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