

Improving Mine Roof Safety

Automated Scaling Bar - Phase 2

In Saskatchewan underground potash mines, the condition of the rock in the overhead roof is of critical importance, as rock falls may cause injury or death of workers and significant equipment damage. The roof of a potash mine is generally designed to be composed of a thick layer of consolidated salt (KCl and NaCl) which is structurally strong. However, weaker clay layers can intrude on this strong salt beam, weakening it and introducing the possibility of large or small falls of material.

This second phase of the project had the aim of automating the process of interpreting scaling bar roof impacts for the purpose of further improving mine roof safety. The goal of this phase of the project was to produce a practical device that could be deployed in underground operations. The device was envisioned as a small box that mounts on the scaling bar, containing microphones and data acquisition hardware as well as computation power to analyze the recorded data and communicate the results to the user. This would also have Bluetooth communication with a worker's tablet or phone for configuration and display of details.

The project team delivered an electronic, hardware and software design for a compact scaling-bar-mounted device capable of recording a scaling bar impact, transmitting the recording to a phone or tablet for analysis, classifying the data as "drummy" or "tight", and displaying the results to the user. A third phase could be considered to further develop this technology.

Proponent: University of Saskatchewan

Project Duration: March to December 2021

Project Cost \$114,125

 IMII and Industry: \$114,125



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