Safety In Mines Research Advisory Committee

Project Summary: SIM120201

Project Title:	**Technology Transfer for "A Risk Based Approach to Enhancing Support Design in Bushveld Underground Mines"**

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Category:	**Mining**	**Applied Research**	**Technology Transfer**

Summary:

A technology transfer program was carried out to facilitate adoption of research outcomes from "A Risk Based Approach to Enhancing Support Design in Bushveld Underground Mines". The risk based approach to support design enables an improved support system to be selected by comparing different mining support strategies based on the injury and cost consequences of Falls of Ground (FoG's).

Twenty stakeholder operations were selected from Champion Mines in the Bushveld Platinum sector to adopt the technology. The project commenced with training sessions together with Open House Management Solutions (OHMS) during the latter part of 2012, following which the operations were tasked to carry out a risk evaluation for support design.

Adoption of the technology comprises the three main stages of:

- Geotechnical Data Acquisition and Interpretation
- Keyblock Analysis
- Risk Evaluation.

SRK carried out reviews of the risk evaluation results at each of the stakeholder operations during February to June 2013. Each of the reviews comprised an underground visit to check data acquisition techniques, and a desktop review to check the data processing, analysis and interpretation of results. Guidance was given where required to address obstacles and improve results.

Outcomes

On completion of the project, it was found that varying success was achieved at each of the stakeholder operations.

Data Acquisition and Interpretation

Data acquisition and interpretation had been carried out with varying success on 80% of the operations. A shortage of tools and equipment on some operations prevented implementation, while on others, data had been acquired through the input of an external consultant.

Keyblock Analysis

The majority of the operations (65%) produced at least one or more support scenario analysis which was available for review to check the methodology and provide guidance to correct errors and improve results. A single operation succeeded in interpreting the comparative outputs from which to select an improved support design for the operation. Licensed, working copies of the keyblock analysis tool had not been obtained at the remaining operations.

Risk Evaluation

A risk evaluation from results of keyblock analysis had not been carried out on any of the stakeholder operations, however an attempt had been made at several shafts. IT restrictions or a lack of data prevented several operations from carrying out the risk evaluation.

Recommendations

A complete adoption of the technology had not progressed to include the final stage of risk evaluation at any of the operations, however success was achieved to a large measure in data acquisition, interpretation and rockfall analysis which are essential elements in the process. Some of the operations had not succeeded in using the technology to carry out any of the stages in risk evaluation.

Going forward:

- A culture of data acquisition and interpretation, having Rock Engineering practitioners suitably equipped with the necessary tools and equipment needs to be promoted in the industry to obtain the basis for technical solutions to reducing the consequences of FoG's.
- Rock Engineering practitioners need to become better acquainted with the concepts of injury- and cost-based risk evaluation for support design.
- The technology needs to undergo further development to suit the requirements of changing ground conditions and mining methods.