

The Centre for Mechanised Mining Systems



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The Centre for Mechanised Mining Systems (the Centre) is a collaborative initiative involving the University of the Witwatersrand (Wits), mining houses, mining equipment suppliers and other stakeholders. Our intent is to jointly develop new capability for the mining industry and act as a catalyst for significant improvements in safety, profitability and sustainability.

The initiative is a holistic systems perspective that addresses the business challenges of the mining industry, both current and long term.

History and background

The issue of mechanisation in the mining industry has become a hot topic in recent years, and in response to this an informal investigation was initiated in 2004 by the University of the Witwatersrand to assess the viability of setting up a Centre for Mechanised Mining Systems. It was concluded that strong and wide support existed from all key stakeholders, namely mining houses, equipment suppliers, the School of Mining Engineering and the School of Mechanical, Industrial and Aeronautical Engineering at Wits University. The Centre is the result.

Although large ore bodies in South Africa tend to have a degree of mechanisation, there is some way to go before those mining activities can be regarded as continuous. There has been limited progress with mechanisation in mining narrow tabular ore bodies due to perceived constraints such as equipment size and excessive dilution, resulting in low effectiveness.

The coal industry has demonstrated significant development in terms of mechanisation with evidence of continuous improvement, but the ideal situation of continuous coal cutting is still difficult to realise. The platinum industry is currently placing greater emphasis on mechanisation; a fact that is reflected in many company strategies and structures. This is due in part to the development of new equipment as a result of sound collaboration between suppliers and mining companies.

Mechanisation in the gold industry is complicated by the depth of many South African gold mines and the consequent rock support requirements. Host rocks mined in gold mines are typically excessively abrasive to machinery, and the requirements for providing adequate mine cooling and ventilation also often limit the degree to which gold mining can be mechanised. The industry is expending significant effort on addressing these challenges. In the diamond industry however activities are mostly mechanised, with boundaries being extended through automation initiatives.

We believe that the successful introduction of new technology and supporting systems will significantly improve safety, profitability and sustainability; ultimately the competitive edge of the future.

The Vision of the Centre

The vision of the Centre is to develop skills and capabilities that make a significant contribution to the successful implementation of mechanised and automated mining in southern Africa and the achievement of international recognition as a Centre for Mechanised Mining Systems.

The Centre's vision is focused on mechanisation which is, fundamentally, the use of machinery in mining. Mechanisation is by no means a new concept to the South African mining industry, as varying degrees of mechanisation have been evident in our mines for over a century. However, the full business potential of increased mechanisation is yet to be realised.



Some of the potential benefits of mechanisation include:

- a safer and healthier mine working environment;
- the generation of more opportunities for “decent work”;
- the attraction of more women to mine work;
- increased productivity;
- higher production rates;
- improved profitability; and
- the attraction and retention of skilled people to the mining industry.

The Centre provides input relating to automation and mechanisation to the undergraduate and postgraduate teaching programmes of the Schools of Mechanical, Industrial and Aeronautical Engineering and Mining Engineering. We are focused primarily on the development of

new teaching material and further enhance the teaching methodology of the engineering Schools.

The Centre supports the University of the Witwatersrand's intention to be research intensive. Research is currently underway to explore current knowledge gaps in mining mechanisation, and is being supported by industry sponsors with the involvement and aid of postgraduate students.

South Africa is currently challenged by a shortage of high-level professionals; a shortage that is impacting on the southern African mining industry, making effective new-technology implementation difficult. The Centre seeks to remedy this issue by establishing links with leading external institutions in order to introduce best practices and methodology into our courses. Such collaborative relationships add unquestionable value to our research projects, and ultimately contribute to the provision of high level skills in engineering and science disciplines.

MISSION OF THE CENTRE

THE CENTRE IS COMMITTED TO ADDING SIGNIFICANT VALUE TO MINING BY:

- developing new skills and capabilities through knowledge transfer;
- influencing thinking on novel mining systems;
- identifying and facilitating the transfer of new technologies;
- undertaking applied research into mechanised mining systems that is linked to high-level skills development; and
- being a catalyst for collaborative partnerships.

KEY FOCUS AREAS OF THE CENTRE

THERE ARE FOUR KEY FOCUS AREAS FOR THE CENTRE, NAMELY:

- skills and competencies development at middle management level;
- thinking and strategy development at executive level;
- skills development at the supervisory level; and
- research and development projects that are linked to high-level skills development.



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