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MINDS FOR MINES



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MEMO

TECHNICAL SUMMARY REPORT

Programme	Longevity of Current Mines	Work Package Name	Optimise Drilling, Charging and Blasting Management Systems		
Milestones #	LoCM23WP3-6	Milestone Name	Close-out report with TSC approval		
Service Provider	CSIR	Research Lead	Braam Greeff		
Start Date	01 February 2024	End Date	01 March 2024	Funding Source	DSI
Aim of Work Package					
Establishing auto measured shot hole dimensions, direction and deviation report calculated charging volume requirements compared with actual charged volume applied and identify most efficient digital monitoring and reporting blast initiation system. The aim to the research project was to perform a literature study on the operational need for the development of an envisaged integrated Automated Drilling, Charging and Blasting (ADCB) Management System. The current mining practices perform the design, drilling, charging and blasting functions as separate manually operated mining processes, which is time consuming and do not provide for the required data to be available in-time to improve the mining processes. The proposed ADCB system shall endeavour to integrate the design, drilling, charging and blasting functions to such an extent that seamless data transfer between the processes will allow for accurate, faster and constant improvement management cycles to become more effective.					
Methodology		Key Findings			
A three-step approach was used during this research project: - Step 1: Contribute towards Capital Development (HCD) in the research effort. A group of MMP young mining engineering interns were enabled to contribute and support the research effort. Two briefing sessions with the intern group were conducted to present the research objectives and the Systems Engineering (SF) approach that will be followed. - Step 2: The research outputs of the intern researcher group were used as input to the requirements analysis process, from which the ADCB user requirements were formulated. - Step 3: completion of the requirements baseline (Step 2) the evaluation criteria were defined, based on the requirements developed in previous steps. The evaluation criteria provide the basis for future collaborative research work to establish a pilot ADCB system.		Key findings of this milestone: - Human Capital Development - ADCB Requirement Baseline Development - Evaluation Criteria Baseline			

Conclusions		Next Steps	
Provided an opportunity for four MMP intern mining engineers to gain experience in the development of an integrated ADCB solution. A requirements baseline is now available to guide future research and collaboration work for the establishment of a pilot implementation at a mining site. A set of evaluation criteria is now available to be used in a competitive Expression Of Interest (EOI) process to select future OEM research partners.		One milestone deliverable (milestone 5) is the signing of memorandum of agreements with OEMs to enable further development of their products to be integrated with the ADCB management solution. It was found that this process be rather included in the next phase work package (2024/25 work) to also incorporate the invitations through a proper Request for Proposal process. The anticipation is that the process would attract more respondents from the OEMs to collaborate/participate.	
Category (RDI)		Research	

Attachments

Milestone Report

[MMP_REP_2023_LoCM23WP3MS6_\[2024-03-22\]A.pdf](#)

Figures

[Figure 1- ADCB Concept of Operation.PNG](#)

[Figure 2- Automated Drilling, Charging and Blasting.png](#)