

ABSTRACT

Slope stability monitoring is a safety critical input in the Slope and Dump Management Plan (SDMP) at Rössing Uranium Limited (RUL) mine. The SDMP was adopted to satisfy the requirements of the D3 standard – management of slope geotechnical hazard at the operation. Through this standard, RUL aims to provide an injury-free and safe working environment for the operation. This is achieved by proactive identification and management of slope risks and instabilities onsite.

This research is a case study of the incorporation of unmanned aerial vehicle (UAV) technology into the slope stability monitoring system (SSM) at RUL, towards conformance to the D3 standard. The study highlights the safety benefits gained by removing personnel from hazardous areas and substituting them with UAVs. The utilisation of UAV data in geotechnical processes such as; the final wall assessment, crack detection and monitoring, as well as dump advancement rate calculations are also discussed.

The study further investigated the use of UAVs for SSM prism inspections and proposes the incorporation of UAVs into the trigger action response plan (TARP). A concept of UAV modification for prism-cleaning operations has been developed through this research, to alleviate the challenges of prism loss in inaccessible areas due to dust accumulation on the prism surfaces.

Key words: UAV, SSM, prism-cleaning, prism-inspections, TARP.