

## INTISARI

Industri pertambangan memiliki tingkat risiko kecelakaan kerja yang tinggi, khususnya pada pengoperasian alat berat seperti *excavator*, *bulldozer*, *wheel loader*, dan *dump truck*. Penelitian ini bertujuan untuk mengidentifikasi potensi bahaya, menilai tingkat risiko, dan menyusun strategi pengendalian keselamatan dan kesehatan kerja pada proses pengoperasian alat berat di area pertambangan menggunakan metode *Hazard Identification, Risk Assessment, and Determining Control* (HIRADC). Metode penelitian menggunakan pendekatan deskriptif-kuantitatif dengan teknik pengumpulan data melalui observasi lapangan, wawancara, dan analisis dokumen Departemen HSE. Hasil penelitian menunjukkan aktivitas *dumping* merupakan yang paling berisiko dengan potensi bahaya berupa kegagalan rem, unit terguling, *blind spot*, serta kelelahan operator, sementara aktivitas *hauling* dan pengoperasian alat muat memiliki risiko sedang hingga tinggi. Penerapan HIRADC mampu memetakan risiko secara sistematis dan memberikan rekomendasi pengendalian, mulai dari SOP, inspeksi rutin, penggunaan APD, pelatihan operator, hingga pengendalian tambahan berupa sensor keselamatan, sistem lalu lintas satu arah, dan monitoring kelelahan. Kesimpulannya, secara teoritis penerapan HIRADC efektif menurunkan tingkat risiko dan dapat dijadikan dasar strategi K3 yang berkelanjutan untuk menciptakan lingkungan kerja pertambangan yang lebih aman, efisien, dan produktif.

Kata kunci: Keselamatan dan Kesehatan Kerja, Alat Berat, Pertambangan, HIRADC, Manajemen Risiko

## ***ABSTRACT***

*The mining industry has a high level of occupational accident risk, particularly in the operation of heavy equipment such as excavators, bulldozers, wheel loaders, and dump trucks. This study aims to identify potential hazards, assess risk levels, and develop occupational safety and health control strategies for the operation of heavy equipment in mining areas using the Hazard Identification, Risk Assessment, and Determining Control (HIRADC) method. The research method used a descriptive-quantitative approach with data collection techniques through field observations, interviews, and analysis of HSE Department documents. The results showed that dumping activities were the most risky with potential hazards such as brake failure, unit rollover, blind spots, and operator fatigue, while hauling and loading equipment operations had moderate to high risks. The application of HIRADC was able to systematically map risks and provide control recommendations, ranging from SOPs, routine inspections, use of PPE, operator training, to additional controls in the form of safety sensors, one-way traffic systems, and fatigue monitoring. In conclusion, theoretically, the application of HIRADC is effective in reducing risk levels and can be used as the basis for a sustainable OSH strategy to create a safer, more efficient, and more productive mining work environment.*

*Keywords: Occupational Health and Safety, Heavy Equipment, Mining, HIRADC, Risk Management*