GTE

Greater Engineering™

Enhancing Mining Operations with Electrical Infrastructure Upgrades

Mining Infrastructure Upgrades – Car Dumpers, Ship Loaders & Car Indexers

Project Background

Client: Major Mining Operation
Date: 2022 - 2025
Location: Western Australia

A significant mining client engaged GTE Group to upgrade their ageing electrical infrastructure, explicitly focusing on critical material handling systems such as car dumpers, ship loaders, and car indexers. These systems were essential to site-wide operations, and any failure would have resulted in costly production downtime.

The challenge was modernising obsolete electrical systems and variable-speed drive (VSD) technology without disrupting operations, ensuring a seamless transition to a more efficient and reliable setup.

Challenges

- The existing infrastructure was ageing, with electronic components reaching end-of-life, increasing the risk of failure.
- The existing equipment was a production bottleneck, meaning a system failure would have halted production entirely.
- Mining sites exposed electrical systems to extreme dust, heat, and continuous operation, accelerating wear and tear.
- The existing infrastructure had been designed around a single Original Equipment Manufacturer (OEM), limiting upgrade flexibility.

Approach and Solution

Electrical System Upgrades

GTE Group developed a structured upgrade programme, focusing on modernising key electrical systems with minimal disruption to operations. The project scope included:

Car Dumper Upgrade
Full electrical system modernisation, including control system enhancements and electrical design for high-efficiency VSDs.

Ship Loader Upgrade
Upgraded automation and electrical drive systems to improve material handling precision.

Car Indexer Upgrade
Replacing legacy drive systems with next-generation technology to ensure reliability and efficiency.

Seamless Turnkey Implementation

To ensure the success of this project, GTE:

- Developed a comprehensive redesign of existing systems, integrating modern VSD technology for optimal performance.
- Managed the project from initial design through to commissioning, ensuring seamless implementation.
- Conducted extensive hardware and software testing to eliminate operational risks.

OEM-Agnostic Approach

GTE provided the client with a multi-OEM evaluation, assessing solutions from industry leaders such as Siemens, ABB, Rockwell, and Schneider. While the client had existing OEM preferences, our team selected the best-fit solution based on long-term reliability and support.

Results and Impact

Operational Security and Reliability

The upgrades eliminated risks associated with ageing electrical infrastructure, ensuring continuous, reliable operation. The improved VSD systems enhanced energy efficiency and systems control, reducing operational costs.

Execution

- The project was completed in phases to minimise downtime and maintain production efficiency.
- Ongoing collaboration with OEMs and site operators ensured seamless integration.
- No safety incidents occurred—a testament to GTE's meticulous planning and execution.

Outcome

GTE's electrical engineering and automation expertise significantly improved the mine's operational resilience. The new infrastructure ensured long-term efficiency, reduced downtime risks, and a scalable electrical system ready for future expansions.
GTE Group combines Electrical Engineering, Control Systems, Functional Safety, and Industrial Communications to deliver multidisciplinary solutions tailored for the mining industry.