GTE

Greater Engineering™

Enhancing Car Dumper Efficiency at BHP

Project Background

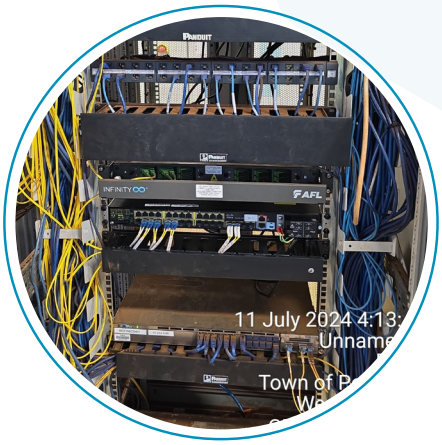
Client: BHP
Date: September 2023 – December 2024
Location: Nelson Point and Finucane Island

Background

BHP embarked on the Rail Corridor Upgrade (RCU) project to enhance port inflow capacity by optimising car dumper efficiency. The primary goal was to reduce rake changeover time (RCT) and automate control processes at all five car dumper sites: CD1, CD2, and CD3 at Nelson Point, and CD4 and CD5 at Finucane Island. This initiative was critical in addressing operational bottlenecks, increasing throughput, and integrating automation solutions to streamline workflows.

Challenges

BHP faced inefficiencies due to prolonged rake changeover times and the need for manual coordination between operators. These challenges led to suboptimal car dumper utilisation and reduced port throughput. Additionally, excessive wear and tear on equipment necessitated a more sustainable and automated approach. A key obstacle was the limitation of the existing network infrastructure, which needed to be extended and enhanced to support the new functionalities of the Remote Control Loading (RCL) system.



The Solution

GTE Group implemented a comprehensive solution to modernise the network infrastructure across all car dumper sites. Key components of the solution included:

- Network Upgrades: Installation of new network capacity and substation-based network switches, along with additional yard switches, ensuring seamless data transmission across the sites.
- Integration with RCU System: Enhancing the infrastructure to support automated train spotting, sequencing, and coordination of car dumper operations.
- Electronic Pneumatic Braking (ECPB): Facilitating smoother train movements, reducing in-train forces, and optimizing operational efficiency.
- CCTV System Testing: Conducting in-house testing to verify system reliability and ensure enhanced monitoring capabilities.
- High-Level and Detailed Network Designs: Developing a robust network architecture for seamless integration with BHP's existing control systems.

Products and Software Used

- Advanced network switches for enhanced connectivity.
- Substation-based and yard switches for improved communication across sites.
- CCTV monitoring systems for operational oversight.

Results and Impact

The implementation of GTE Group's solution led to significant improvements, including:

- Reduced Rake Changeover Times: Automation streamlined processes, minimizing delays and optimizing car dumper efficiency.
- Enhanced Network Reliability: The upgraded infrastructure supported seamless data exchange, improving coordination between operators and train drivers.
- Increased Port Throughput: The improved system facilitated faster and more reliable operations, leading to greater overall productivity at Nelson Point and Finucane Island.
- Optimized Equipment Longevity: Reduction in manual interventions and improved automation resulted in less wear and tear on critical assets.

Project Outcome

By the project's completion in December 2024, BHP achieved its objective of enhancing car dumper efficiency, improving port inflow capacity, and optimizing operational performance. The upgraded network infrastructure ensured seamless integration of automation processes, driving increased throughput and reinforcing BHP's commitment to innovation and operational excellence.