MINCKA.

ASSET INTEGRITY ENGINEERS

PROJECT RECORD

CASE 06

MINING PLANT

Dump Body Exchange System Design Certification

LOCATION TO CONFIRM / STRUCTURAL AND MECHANICAL

CHALLENGE

A dump body exchange system lifts and holds multi-tonne haul truck bodies during exchange, with up to 20 tonnes carried on each hydraulic column and 80 tonnes across the ground support, so any shortfall in structural, hydraulic or foundation capacity is a direct safety exposure to personnel working beneath the load. Before the system could be released into service on a mine site, the operator needed independent confirmation that the as-designed plant complied with the relevant Australian standards and the mining plant guideline MDG 15.

APPROACH

Mincka built an independent finite element model of the full system, covering the columns, support fixtures, ground support and reinforced concrete foundation, and assessed structural compliance against the relevant Australian standards. The critical columns were additionally checked under seismic loading. The hydraulic circuit was verified for safety devices, filtration, monitoring and maintainability, the vehicle support fixtures against the applicable support stand standard, and the foundation against the relevant concrete and reinforcement standards, with the whole assessment framed by MDG 15.

OUTCOME

Every component was verified within its allowable stress limit. On that basis the system was certified compliant across every applicable Australian standard and the mining plant guideline MDG 15, spanning the structural, mechanical, hydraulic and foundation scopes. The result gave the operator an independently verified compliance position, signed off by a registered structural or mechanical engineer, enabling the system to be released into service under the stated conditions of certification.

CAPABILITIES APPLIED

- INDEPENDENT DESIGN CERTIFICATION
- FINITE ELEMENT ANALYSIS
- STRUCTURAL COMPLIANCE TO AS 3990 AND AS 4100
- SEISMIC ASSESSMENT TO AS 1170.4
- HYDRAULIC SYSTEM VERIFICATION TO AS 2671
- FOUNDATION CHECK TO AS 3600 AND AS/NZS 4671

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