MINCKA.

ASSET INTEGRITY ENGINEERS

PROJECT RECORD

CASE 03

MINERAL PROCESSING

Processing Bins Thickness Measurement and Engineering Assessment

MUCHEA, WA, AUSTRALIA / INSPECTION & ASSESSMENT

CHALLENGE

A mineral processing plant relies on an inventory of steel storage bins handling coal, char and ilmenite. Abrasive discharge flow concentrates wall loss in the conical hopper of each bin, yet no measured thickness baseline existed: every bin is a confined space, several sit in combustible dust zones, and a credible condition picture demands hundreds of readings per campaign, beyond what manual methods can deliver safely within a shutdown window. The operator needed a defensible structural baseline before wall loss eroded margins unseen.

APPROACH

Within a single shutdown campaign, Mincka deployed a magnetic robotic crawler with zone-rated support equipment to scan the hopper wear band of each bin, recording 849 encoder-tracked ultrasonic thickness measurements across the bins to AS/NZS ISO 16809. The minimum allowable wall thickness for every bin was then calculated to AS 3774, with structural capacity assessed to AS 4100, and each bin was classified under Mincka's severity framework, turning raw readings into an engineering position on the structural margin of every asset.

OUTCOME

All inspected bins comply with their minimum allowable wall thickness, with measured margins ranging from twice to more than twenty-six times the structural requirement and no immediate remediation required. Localised thinning at two bins was detected and flagged for priority re-measurement before margins erode, and the campaign establishes the integrity baseline from which wear rates and inspection intervals will now be calculated. The full programme was delivered within the shutdown window at a lower cost than equivalent manual inspection, and the operator received an RPEQ-signed assessment with a risk-based, per-bin inspection schedule in place of calendar-driven assumptions.

CAPABILITIES APPLIED

- ROBOTIC UT CRAWLER INSPECTION
- ULTRASONIC WALL THICKNESS MAPPING
- MINIMUM WALL THICKNESS TO AS 3774
- RISK-BASED INSPECTION SCHEDULING

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