PORT KEMBLA COAL TERMINAL STACKER & RECLAIMER DEMOLITION STAGE 2.

Location
Wollongong, NSW

Client
Port Kembla Coal Terminal Ltd (PKCT)

Duration
6 months

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Project overview

Liberty Industrial carried out the demolition of a 1,250 tonne bucket-wheel reclaimer and two 500 tonne stackers at the Port Kembla Coal Terminal located in Wollongong, New South Wales, Australia. The works formed part of a broader terminal restoration project following the commissioning of new coal handling machinery at the terminal.

The terminal is a key coal exporting facility on Australia’s east coast. It has been undergoing extensive improvements over the past 5 years, including the complete replacement of its ageing coal stacking and reclaiming machineries. Following the introduction and commissioning of a new bucket-wheel reclaimer and three new stackers, the old machines were retired and parked at the far end of the coal stockyards for removal.

The induced collapse of each structure with the aid of explosives would have been the most practical and cost-effective approach. However, this was not permissible as the three machines were still straddling live conveyor lines, and within close proximity to operational terminal assets.

Relocation of the machines to a more secluded location, away from the operational conveyor lines where an induced collapse would have been possible, was also unachievable due to the presence of the new machines, blocking the way out.

The most suitable solution quickly emerged as the deconstruction of the machines in situ, from the top-down and into manageable pieces that could be lifted with a mobile crane. A mobile crane would be deployed and manoeuvred within the coal stockyards as close as possible to each structure.

The key challenge at the planning stage of the project was designing the lifts and sequencing the works to ensure optimum balance between financial viability, and technical feasibility. The lifts had to be large enough to minimise overall craneage time and cost, leaving the bulk of the downsizing to conventional demolition machinery on the ground, while remaining manageable enough to be lifted with a mobile crane.

Our Structural Engineers completely modelled the redundant reclaimer and stackers using CAD software then, working hand in hand with our experienced demolition project team, identified the optimum deconstruction sequence. The tool for the task finally emerged as the Liebherr LR1750, a lattice boom crawler crane with a maximum rated lifting capacity of 750 tonnes.

Our Engineers then further refined the dismantling methodology. They considered key specifics such as sequencing the lifts to minimise the amount of crane relocations. Maneuvering a heavy lift mobile crane tends to be an expensive and time-consuming exercises as they usually require full disassembly and reassembly.
Structural Engineers conducted a complete structural assessment of the redundant machines at each step of the dismantling to ensure that each structure would remain stable at all times. For instance, the bucket-wheel and main boom had to be removed in a very specific order and in parallel with the removal of the counterweight modules to prevent instability or worse, the toppling of the entire superstructure.

Our Structural Engineers specified a range of preparatory works including the removal of targeted parts and equipment to reduce masses and adjust each structure’s centre of gravity, as well as local strengthening of each structure in key areas.

Following this extensive engineering phase, our demolition team prepared the structures in readiness for the dismantling. The works physically commenced with the separation and extraction of the impact tables from underneath the coal handling machines without causing any damage to the live conveyor belts.

Hoarding protections were then installed over the conveyors and the machines were then parked directly atop them. These hoardings would protect the operational conveyor lines from falling objects or hot works by-products inherent to the demolition activities. This in turn allowed the terminal to keep the conveyors active during the deconstruction, minimising disruption to the terminal’s operations.

Following the disconnection of the stackers and reclaimers from their electrical power supply and ancillary services, all remaining hazardous materials were removed in a lawful and environmentally friendly manner. This included the removal of bonded asbestos and various hydrocarbon substances.

As the preparatory works neared completion, the mobile crane was erected, and deconstruction commenced. Following the parameters of highly detailed engineered lift studies, the modules were systematically rigged, separated, then lifted and lowered into the stockyards at designated laydown locations. These modules, with the heaviest standing at a proud 220 tonnes, were subsequently demolished on the ground using a range of 25 to 48-tonne excavators fitted with shears and grab attachments. The processed materials were then removed from site for recycling.

A significant part of these works would have normally required a complete shutdown of key operational assets within the terminal, however the deconstruction methodology proposed by Liberty Industrial allowed for all works to be carried out safely, with minimum disruption to the terminal’s operations, keeping the actual shutdowns to minimum occurrences and durations.

Achieving minimal disruption to the operational coal terminal facility was critical to the project’s success. With demolition occurring within close vicinity to operational coal handling infrastructure, intelligent engineering and extensive planning and coordination, were key to the successful completion of the works without significant disruption to the terminal’s operations.

The project was shortlisted as a finalist for the 2019 World Demolition Awards in the ‘Contract of the year over US$1 million’ award category.