

SMART STOCKYARD MANAGEMENT SYSTEM

STEPS TOWARDS TO A FULLY AUTOMATED AND OPTIMISED STOCKYARD

MRA's Smart Stockyard Management System (SMS) is a world leader in stockyard automation and optimisation for bulk materials handling and is ideal for coal, iron ore, bauxite and cement. The SMS is being used to process 250 MTPA, representing 65% of Australia's coal exports, including Port Waratah, the largest coal export terminal in the world.

LEVELS OF STOCKYARD AUTOMATION

The SMS is award-winning and offers several levels of automation and optional add-on modules. Each of these systems and modules are operationally deployed.

- 1. Fully Manual:** operator controlled at all times.
- 2. Manual Setup:** partial automation with the operator required to set start positions for stacking and reclaiming a stockpile or bench.
- 3. Basic Automation:** for stacking and reclaiming whole stockpiles but requires manual setup for partially stacked and reclaimed stockpiles.
- 4. Basic Plus:** MRA SmartStart used to set stacking and reclaimer start positions to augment PLC sequencing. Ideal for a mine site or power station stockyard.
- 5. Advanced Automation:** MRA Smart Sequence for high level automation of complex stacking and reclaiming methods. Ideal for a fully-flexible port automation.

OPTIMISED THROUGHPUT

The SMS won the Australian Bulk Handling Award for Innovative Technology 2019 for its laser optimisation which increased production throughput at Abbot Point Coal Terminal

by 11.3% across six stacker/reclaimers by using MRA's SmartTurn.

The cornerstone of the optimisation is a highly accurate, volumetric stockpile modelling system, which is enhanced with scanning lasers on each reclaimer.

Optimisation benefits come from an increased time-in-material with a reduction in slew cut turnaround times as it eliminates air digging. A Volumetric look-ahead feature uses predictive methods to reduce volume spikes which causes machine stress which lowers machine life.

CORE SMS MODULES

3D Modelling and Visualisation

Identifies material in the stockyard in 3D with the positioning and live status of yard machines and includes a 30-day playback of operations. Can be enhanced with MRA's SmartScan.

Machine to Stockpile Collision

Detection Tracks machine and stockpile positions for added protection for collision avoidance.

Reclaimer Optimisation - SmartTurn

Optimise turnarounds to eliminate air

swinging and enable volumetric look ahead to enhance throughput and reduce machine stress with a more even material flow.

Stacker and Reclaiming Task

Management Define and execute stack and reclaim tasks remotely from the operations room.

3D Quality Tracking

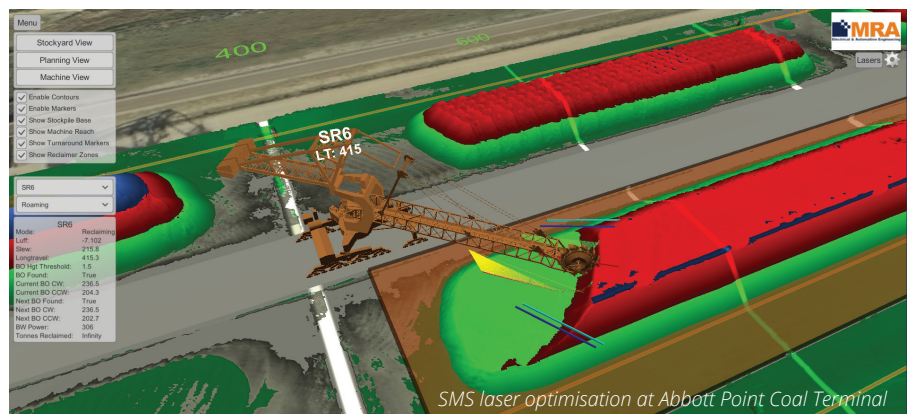
Track and view quality properties in the stockyard down to 0.1 cubic metre blocks in real time. Analyse quality metrics prior to reclaiming, and track quality throughout the material work flow.

Smart Analytics and Reporting

Track stacking and reclaim tasks; inloading and outloading job performance; stockyard KPIs.

Operations Planning

Enables yard space planning based on scheduled inloading and outloading. A 48-hour Play Forward can check for yard or machine space conflicts with plan changes.



Keen to find out more?

You're welcome to contact our Engineering Manager Peter McPherson [m 0403 453 250](tel:0403453250) [e peter.mcpherson@mra.com.au](mailto:peter.mcpherson@mra.com.au) [w mra.com.au](http://mra.com.au)

STEPS TOWARDS A FULLY AUTOMATED AND OPTIMISED STOCKYARD

LEVEL OF AUTOMATION	FULLY MANUAL	MANUAL SETUP	BASIC AUTOMATION	BASIC PLUS	ADVANCED AUTOMATION
OPERATING CHARACTERISTICS	Operator controlled at all times	Operator needed to set start position	Automates whole stockpile stacking and reclaiming	Automated stacking and reclaiming	Supports complex partial stacking and reclaiming
OPERATING LIMITATIONS	Coordination difficult with multiple machines	Operator required for all changes	Partially stacked and reclaimed stockpiles require manual setup	Limited stacking and reclaim combinations available	-
OPERATIONAL BENEFITS	PLC sequencing	PLC sequencing	PLC sequencing	MIRA SmartStart	MIRA Smart Sequence
Improve oversight and increase safety	3D Modelling and Visualisation				
Reduce accidents	Machine to Stockpile Collision Detection				
Increase throughput, reduce machine stress and de-man	Reclaimer Optimisation – SmartTurn				
Fully de-man machines	Stacker and Reclaimer Task Management				
Track quality of material	3D Quality Tracking and Display				
Real time reporting and analysis	Smart Analytics and Reporting				
Planning oversight	Operations Planning				