

DUST FREE BULK HANDLING

Case Studies





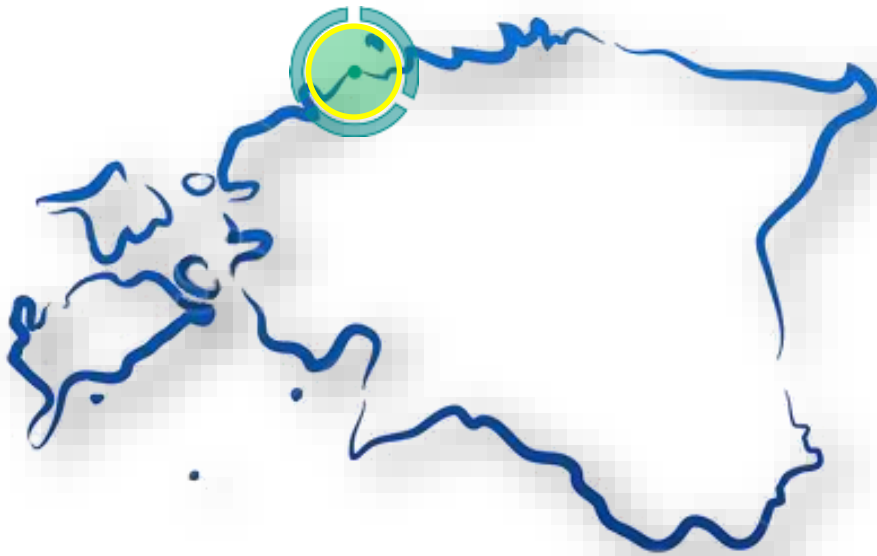
**BROUGHT
TO YOU BY**

RAM
SPREADERS

TALLINN - ESTONIA

Port of Tallinn has:

5 major cargo harbors



Capacity:

5.0 million tonnes of **cereal grain**

7.5 million tonnes of **coal**

2.3 million tonnes of **fertilizers**

Estonia's natural resources:

Oil-shale | Construction gravel | Granite |

Limestone | Wood

Export:

Wood products | Mineral fuels | Iron | Steel

Port of Tallinn generally handles:

Grain | Coal | Fertilizer | Scrap Metal | Crushed Stone | Lime Stone

SOURCES OF DUST



SOURCES OF DUST



TRANSFER POINTS

- OPEN WAGONS
- OPEN STOCKPILES
- SHIP LOADING



SOURCES OF DUST

TRANSFER POINTS
OPEN WAGONS
OPEN STOCKPILES
SHIP LOADING



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SOURCES OF DUST

TRANSFER POINTS
OPEN WAGONS
OPEN STOCKPILES
SHIP LOADING



SOURCES OF DUST

During these processes the commodity
is handled multiple times
Resulting in losses and dust!

Dust is generated ***at any point*** in the logistic cycle
when energy is ***added*** to materials



CURRENT BULK HANDLING METHODS

Many companies are having to look at systems to reduce levels of contamination, but also cost effective to meet current environmental guidelines.



Containerised BULK HANDLING



A NEW METHOD OF BULK HANDLING

A new method to export bulk is available

Containerised Bulk Handling is in operation at various bulk and standard container terminals and has already won 2 awards for its environmental benefits and innovative technology



CONTAINERISED BULK HANDLING

The CBH system uses sealed containers as a method of storage and transport with a rotating spreader which handles the container, lifts the lid and rotates the container, gently tipping the commodity out



CONTAINERISED BULK HANDLING



CONTAINERISED BULK HANDLING

THE PROCESS



FILL the CONTAINER at the MINE

- *EXISTING SITE EQUIPMENT USED*
- *NO LOSS OF COMMODITY*
- *NO CLEAN UP REQUIRED*

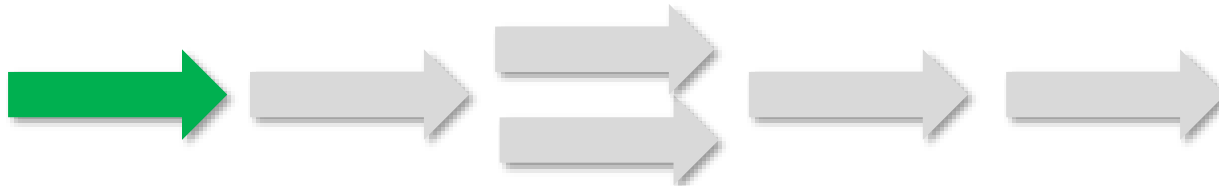
FILL

SEAL

TRANSPORT

STORE

LOAD



CONTAINERISED BULK HANDLING

THE PROCESS



FILL

SEAL

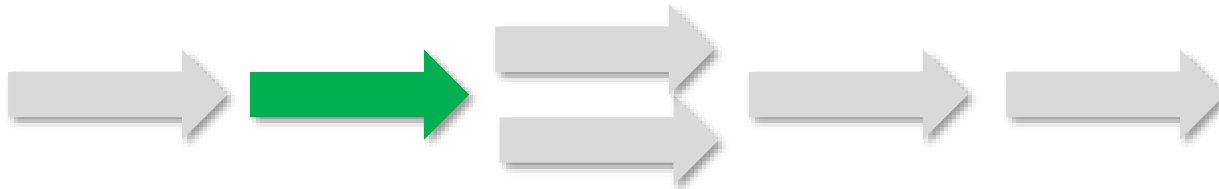
TRANSPORT

STORE

LOAD

SEAL the CONTAINER

- EXISTING SITE EQUIPMENT USED
- SELF LOCKING LID SYSTEM
- SEALS COMMODITY UNTIL LOADING
- NO CONTAMINATION



CONTAINERISED BULK HANDLING

THE PROCESS



SEND CONTAINER by RAIL

- *SEALED CONTAINERS – NO DUST*
- *NO CONTAMINATION*
- *NO LOSS OF COMMODITY*

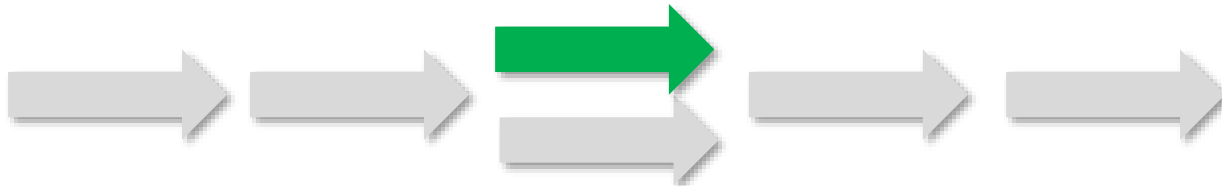
FILL

SEAL

TRANSPORT

STORE

LOAD



CONTAINERISED BULK HANDLING

THE PROCESS



Or SEND CONTAINER by ROAD

- *USING EXISTING ROAD NETWORK*

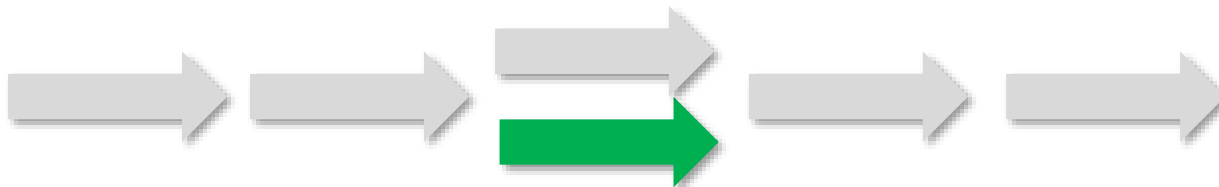
FILL

SEAL

TRANSPORT

STORE

LOAD



CONTAINERISED BULK HANDLING

THE PROCESS



FILL

SEAL

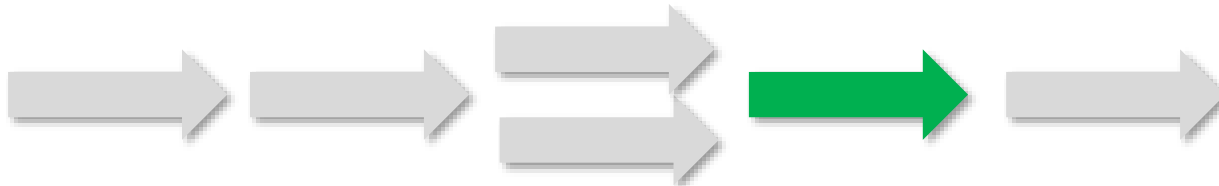
TRANSPORT

STORE

LOAD

STORE CONTAINERS AT PORT

- *NO STOCK PILE – NO DUST*
- *NO CONTAMINATION*
- *FAST & EFFICIENT LOADING*
- *STORE MULTIPLE TYPES OF COMMODITES AT SAME AREA WITH **NO** CROSS CONTAMINATION*



CONTAINERISED BULK HANDLING

THE PROCESS

FILL

SEAL

TRANSPORT

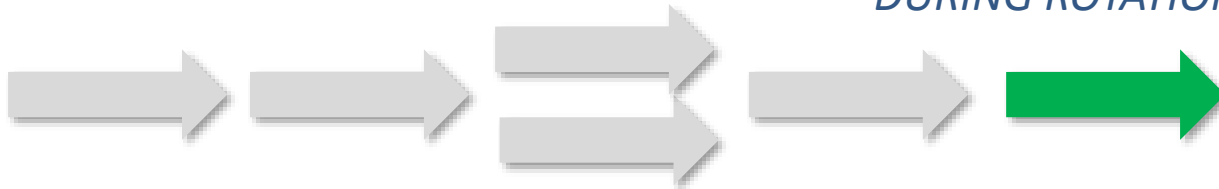
STORE

LOAD



LOAD using RAM Revolver

- *FOR ALL TYPES OF CRANE*
- *LOADS OF UP TO 1,000 TPH**
*subject to commodity & loading conditions
- *SWL – UP TO 45T*
- *LID LIFTER TECHNOLOGY – NO CONTAMINATION – NO DUST*
- *TWISTLOCK & GRIPPERS SECURE CONTAINER DURING ROTATION*



CONTAINERISED BULK HANDLING

MISTING SYSTEM



MISTING SYTEM **OFF**



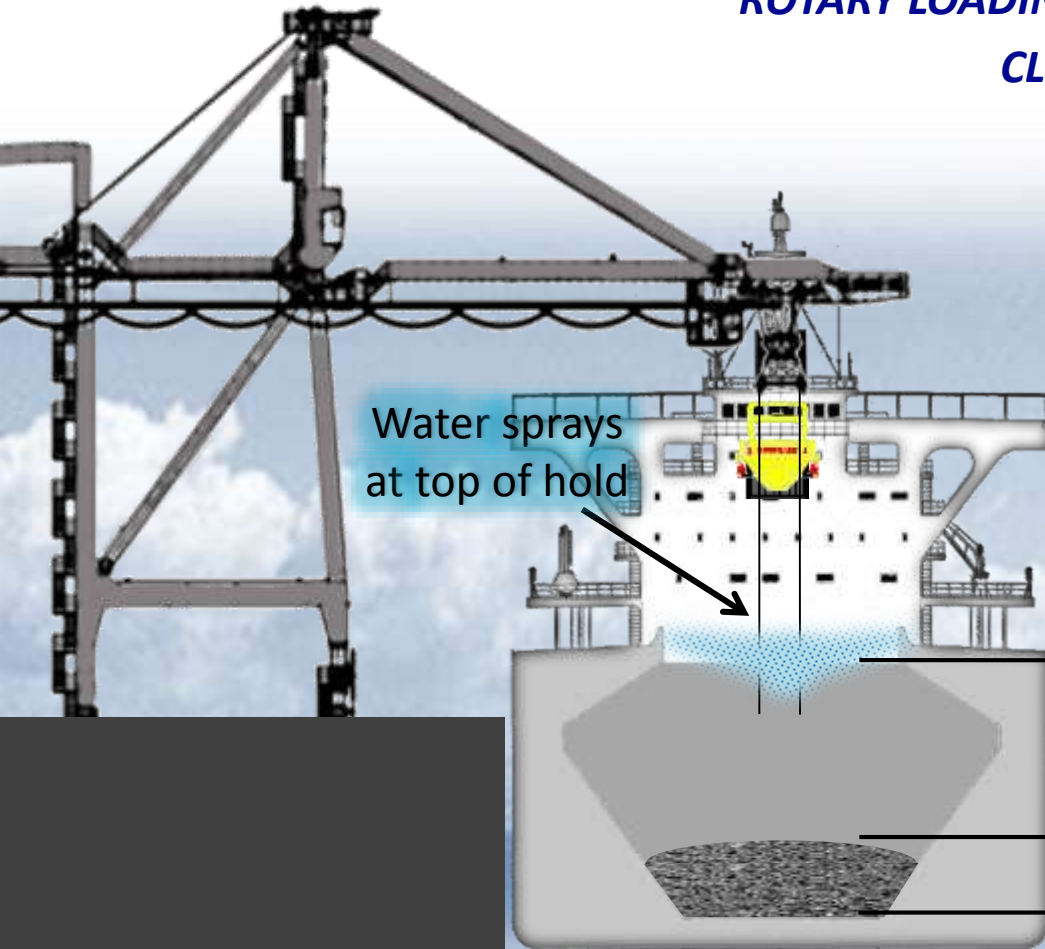
MISTING SYSTEM **ON**

- no** contamination
- no** material loss

CONTAINERISED BULK HANDLING

LOADING PROCESS

ROTARY LOADING WITH VIRTUALLY NO DUST GENERATED CLEANEST ORE LOADING SYSTEM AVAILABLE



Water sprays at top of hold

- Ships hold loaded to a 3rd full due to density of ore
- Peak of 5m cargo depth provides 12m air height in hold
- Leaves plenty of room IN HOLD to unload ore
- Unloading normally to within 1m of top of cargo – greatly reduces dust generation

17m Total area depth

12m Air height in hold

5m Cargo depth

CONTAINERISED BULK HANDLING

CBH BENEFITS

COST

Lower set up costs

*No conveyor,
ship loaders or
storage sheds*

ENVIRONMENTAL

Zero Dust - No clean up

*Best practice by EPA
with fast approval*

SAFE & FAST

Virtually unmanned
operation

*With loading rates
of 1000 tonnes per
crane per hour*

PROVEN & REPRODUCIBLE

Providing a simple
proven turnkey
solution to
importers

CASE STUDIES



CASE STUDY 1

COMPANY: Transnet Port Elizabeth

COMMODITY: Manganese

EQUIPMENT: Ship to Shore Crane

CASE STUDY 1

PORT ELIZABETH

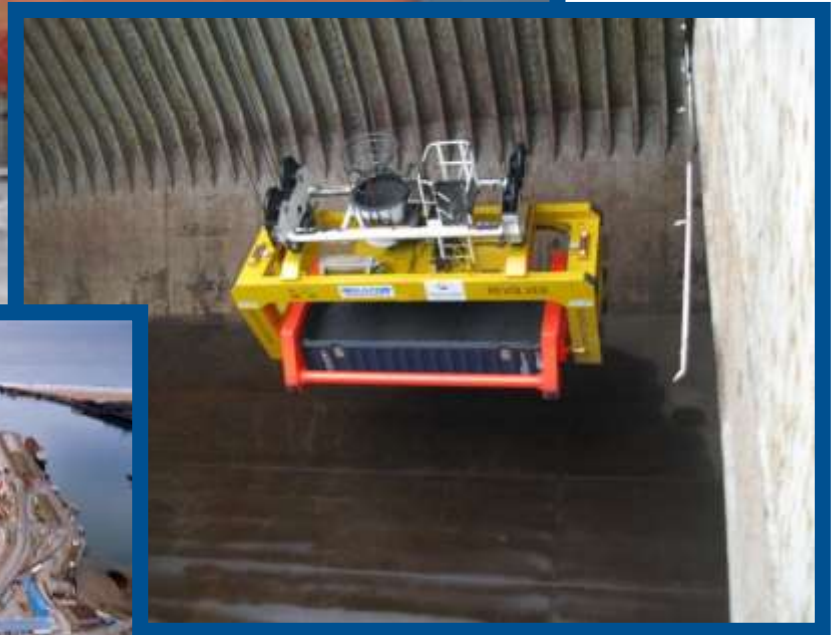
South Africa



CASE STUDY 1

PORT ELIZABETH

South Africa



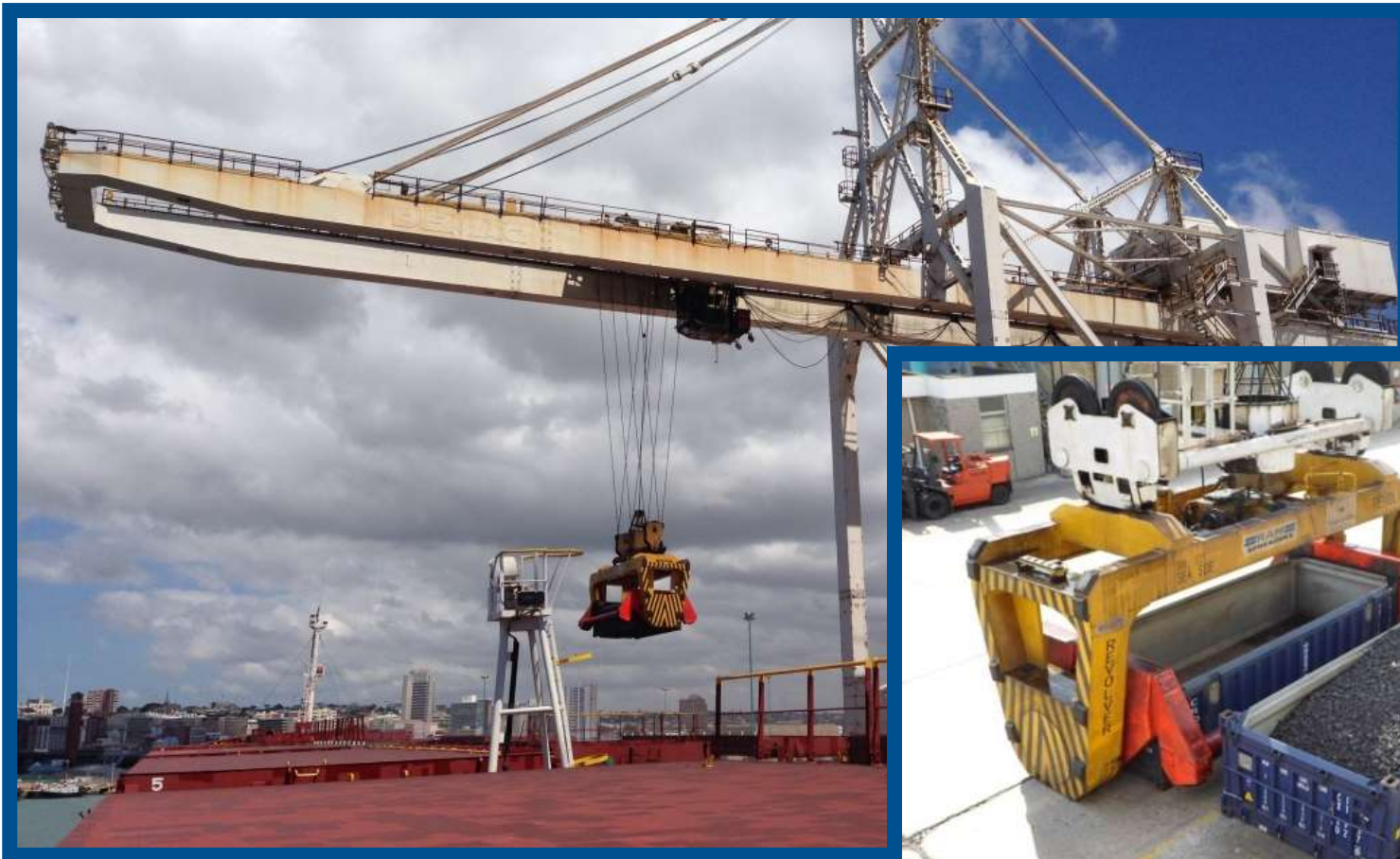
CASE STUDY 1

PORT ELIZABETH

South Africa



Tshipi é Ntle
Manganese Mining



CASE STUDY 1

PORT ELIZABETH

South Africa



Tshipi é Ntle
Manganese Mining



CASE STUDY 1

PORT ELIZABETH

South Africa



Transnet's introduction of Containerised Bulk Handling delights customers and is breaking bulk handling records in South Africa

*A record breaking 14,230 tonnes
of Manganese was loaded in just 12 hours*

CASE STUDY 2

A yellow RAM spreader is being lifted by a ship crane. The spreader is suspended by several cables and is positioned over a large, open hatch on the deck of a ship. The background shows the ship's structure and a ladder.

COMPANY: TPR Rosario

COMMODITY: Grain

EQUIPMENT: Ship Crane

CASE STUDY 2

TPR Rosario - Argentina

Overview

TPR Rosario is the first terminal in the world to utilize Containerised Bulk Handling.

The terminal is a key gateway hub for Argentina, handling all types of import and export cargo.



CASE STUDY 2

TPR Rosario - Argentina

Challenges

Growing business of exporting grain required TPR to find a method to improve productivity whilst also simplifying the operation.

Limited investment capacity – existing equipment has to be used or modified.

Traditional contamination of commodity from open stockpiles.



CASE STUDY 2

TPR Rosario - Argentina

Fill at the Farm

*Agri-bulk loaded into specially designed high
cube 20ft containers*



Containers as Transport **and** Silo

Multipurpose use:

Fill | Transport | Store | Empty | Re-use



CASE STUDY 2

TPR Rosario - Argentina

The Problem

Contamination of Commodity

Open stockpiles at risk of “spoil” due to:

- **Contamination** from vermin & birds
- **Moisture**
- **Airborne contaminants**
- **Open top transport** from farm to port
- **Other physical** external contaminants



The Solution

Contamination free

CBH contamination free process down to:

Commodity

- Being stored in **sealed** containers
- Kept secure and dry throughout the process

Lid on Container

- Lifted **only** during rotation of commodity into the ships hold



CASE STUDY 2

TPR Rosario - Argentina

Benefits

- **Fast loading rates with CBH**
- **Handling process can be as high as 25 cycles per hour**
- **Up to 1,000 tons per hour can be achieved**
- **Minimal material loss**
- **Innovative lid system means no material loss during CBH process**



CASE STUDY 2

TPR Rosario - Argentina

Solution

Any container terminal

- *CBH allows exporters to take the grain to any container terminal*

Storage – Sealed Container

- *Grain stored in high cube 20ft or 40ft containers with lids*
- *No material loss*

Portable

- *Containers can be re-located to other operation port **with the rotating spreader***



CASE STUDY 3

A faded background image of a port. A large ship crane is visible on the left, with a yellow and red spreader basket suspended from it. In the foreground, two workers in yellow high-visibility jackets and white hard hats are looking at a document. The background shows a large ship and other port infrastructure under a bright sky.

COMPANY: Patrick Ports & Stevedoring

COMMODITY: Copper Concentrate

EQUIPMENT: Ship Crane

CASE STUDY 3



15 Lifts per hour

400 Tonnes per crane per hour

2 Cranes

18000 Tonnes per day

***CASE STUDY
TESTIMONIALS***

CASE STUDY - TESTIMONIAL

Environmental Benefits

Turning DP World Adelaide from a standard container terminal into a bulk handling terminal raised an interesting reaction.

“The sailing squadron next to the terminal came to me one day to protest about the new system of bulk export being introduced at the terminal, and they wouldn’t allow us to operate the system as it would create red dust on their sailing boats.

“They had slack jaws when I told them the system had already been running for six months with zero emissions”

DPW Adelaide



Ray Lee

Regional Director
DPW Australia
2009-2011

CASE STUDY - TESTIMONIAL

...and terminal growth

“DPW Adelaide was an under utilized terminal with low berth occupancy and little growth prospects”

“...to grow the terminal we needed to think outside traditional income sources”

DPW Adelaide



Ray Lee

Regional Director

DPW Australia

2009-2011

CASE STUDY - TESTIMONIAL

Low capital expenditure

“Patrick was able to utilize this new revolving spreader technology to export copper concentrate for our client with very little capital”

“Our Client was extremely pleased with the dust free solution”

Patrick / Asciano



Adrian Howard
Commercial Director
Patrick

CASE STUDY - TESTIMONIAL

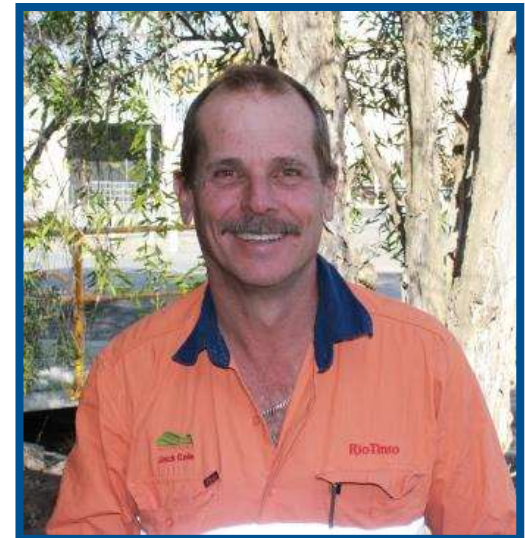
High loading rates minimize shipping costs

“Environmentally it is a very clean system due to containers being emptied directly into the ship’s hold thereby minimizing a number of dust generating points”

“Loading rates of 15,000 wmt/day being achieved are such that it helps to minimize shipping costs”

North Park Mines

Miners Perspective



Jack Cole

North Park Mines

CASE STUDY – FURTHER EXAMPLES

MAPUTO



COAL

- IRON ORE
- MANGANESE
- COPPER
- GRAIN

MHC CRANE

- SHIPS CRANE
- STS CRANE
- BRIDGE CRANE

CASE STUDY – FURTHER EXAMPLES

EAST LONDON



COAL

- IRON ORE
- MANGANESE
- COPPER
- GRAIN

MHC CRANE

- SHIPS CRANE
- STS CRANE
- BRIDGE CRANE

CASE STUDY – FURTHER EXAMPLES

ADELAIDE



- COAL
- IRON ORE**
- MANGANESE
- COPPER
- GRAIN

- MHC CRANE
- SHIPS CRANE**
- STS CRANE
- BRIDGE CRANE

CASE STUDY – FURTHER EXAMPLES

CONGO



COAL

IRON ORE

MANGANESE

COPPER

GRAIN

MHC CRANE

SHIPS CRANE

STS CRANE

BRIDGE CRANE

CASE STUDY – FURTHER EXAMPLES

CHILE



- COAL
- IRON ORE
- MANGANESE
- COPPER**
- GRAIN

- MHC CRANE**
- SHIPS CRANE
- STS CRANE
- BRIDGE CRANE

CASE STUDY – FURTHER EXAMPLES

LAS BAMBAS - PERU



COAL
IRON ORE
MANGANESE

COPPER

GRAIN

MHC CRANE

SHIPS CRANE

STS CRANE

BRIDGE CRANE

CASE STUDY – FURTHER EXAMPLES

MAURITANIA



IRON ORE



FIRST QUANTUM
MINERALS LTD.

COSTINGS

CBH - COMPARISONS



MHC Model

- *Cranes x 2 = USD\$ 8,000,000.00*
- *Containers x 30 = USD\$ 300,000.00*
- *CHE = USD\$ 500,000.00*
- *Revolver's = USD\$ 1,500,000.00*

= 10 MILLION

Ships Crane Model

- *Revolver's x 2 = USD\$ 800,000.00*
- *Misting System = USD\$ 200,000.00*
- *Container = USD\$ Leased*
- *Fork Truck = USD\$ Leased*

= 1 MILLION

BENEFITS

CBH - BENEFITS







- ✓ **Flexible Berths – No fixed bulk berths**
- ✓ **Fast to start**
- ✓ **No dust**
- ✓ **Low cost**

BENEFITS

CBH BENEFITS



- 
Cost
 - Lower set up costs (No conveyor, ship loaders, storage sheds)
- 
Environmental
 - Zero dust, no clean up
 - Best practice by EPA with fast approval
- 
Safe & Fast
 - Virtually man less operation with loading rates of 1700 TPH per crane
- 
Proven & Reproducible
 - Providing a simple proven turnkey solution to exporters

EQUIPMENT

INTEGRATED APPROACH

Revolver®



Cranes



Dust Suppression



Containers



Container Handlers



REVOLVER trailer system



EQUIPMENT

Ship to Shore



Mobile Harbour



Ship Crane



Reach Stacker



COMMODITIES HANDLED

**LOAD
&
DISCHARGE**

Grains

**Minerals
sands**

Soya

**Wood
chip**

**Copper
concentrate**

Iron ore

Coal

**Bagged
material**

**Scrap
metals**

CBH COMPANIES

Exxaro

Grinrod

DP World

Eletheni/ SNR

BHP B

Oz Minerals

Hillgrove Copper

Transnet

FQML

TPR Argentina

Ironclad

Patrick

MMG Las Bambas

Riga Universal Terminals





**“Not often do you get a solution
that is the lowest cost
but also the best practice
environmentally”**



AWARD WINNING



2014

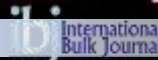
Winner of the IBJ

Environmental Protection Award

*For contamination & dust free
Containerised Bulk Handling*



RAM & Patrick Ports & Stevedoring, Australia



2016

Winner of the IBJ

Innovative Technology Award

*For Bi-Modal Containerised Bulk Handling
from Las Bambas Mine to Matarani Port*



RAM & MMG Las Bambas, Peru

