

DUST FREE BULK HANDLING

Case Studies





CONTENTS

SOURCES OF DUST

Transfer Point - Open Wagon
Open Stock Piles - Ship Loading

CBH PROCESS

Fill – Transport – Store - Load

CBH SYSTEM BENEFITS

Cost
Environmental
Safe and Fast
Proven & Reproducible

CASE STUDY 1

South Africa Transnet
Manganese

CASE STUDY 2

TPR Argentina
MHC Crane

FURTHER EXAMPLES

DPW - Coal - Maputo
Elitheni – Coal - South Africa
Ironclad – Iron Ore - Adelaide
Exxaro – Iron Ore - Congo
Puerto Angamos – Copper - Chile
FQML – Iron Ore - Mauritania
MMG Las Bambas - Peru
Argentina Puerto Rosario

SOURCES OF DUST

Transfer points

Vehicles - open wagon & wheels

Open stockpiles

Ship loading

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

SOURCES OF DUST



TRANSFER POINT

OPEN WAGONS

OPEN STOCK PILES

SHIP LOADING

SOURCES OF DUST



TRANSFER POINT

OPEN WAGONS

OPEN STOCK PILES

SHIP LOADING

SOURCES OF DUST



TRANSFER POINT

OPEN WAGONS

OPEN STOCK PILES

SHIP LOADING

SOURCES OF DUST



TRANSFER POINT

OPEN WAGONS

OPEN STOCK PILES

SHIP LOADING

CONTAINERISED BULK HANDLING

THE 4 STAGES



CONTAINERISED BULK HANDLING

FILL

TRANSPORT

STORE

LOAD



FILL CONTAINER AT THE MINE

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

CONTAINERISED BULK HANDLING

FILL

TRANSPORT

STORE

LOAD



SEAL CONTAINER

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

CONTAINERISED BULK HANDLING



FILL

TRANSPORT

STORE

LOAD

SEND CONTAINER BY RAIL

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

CONTAINERISED BULK HANDLING

FILL

TRANSPORT

STORE

LOAD



Or SEND CONTAINER BY ROAD

- *USING EXISTING ROAD NETWORK*

CONTAINERISED BULK HANDLING

FILL

TRANSPORT

STORE

LOAD



STORE CONTAINERS AT PORT

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

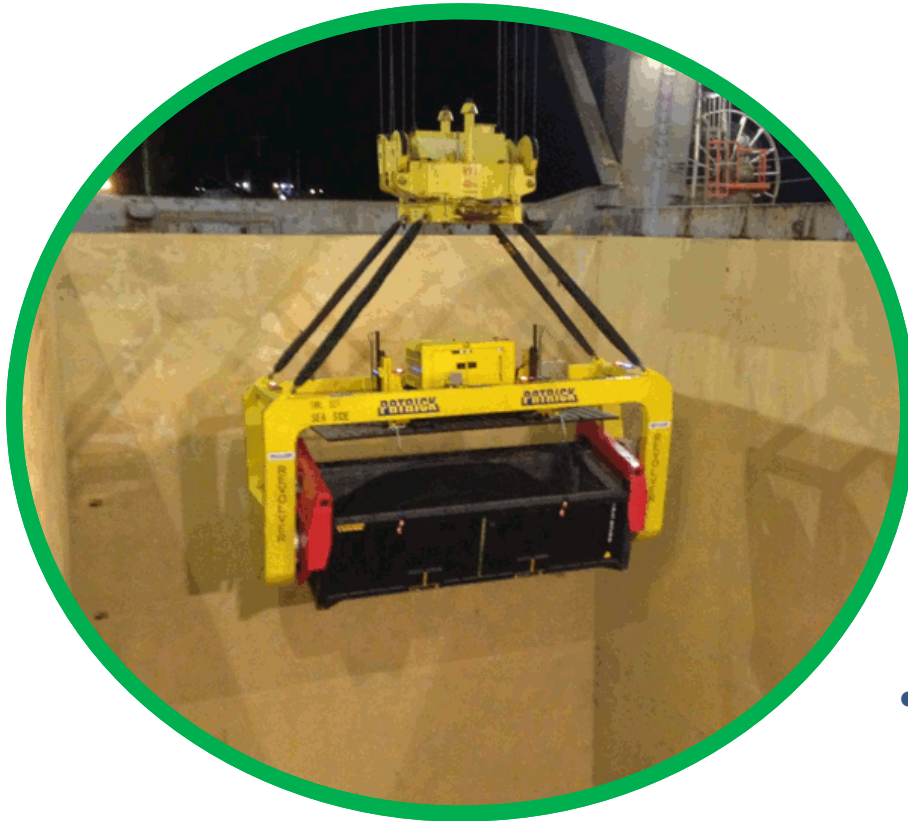
CONTAINERISED BULK HANDLING

FILL

TRANSPORT

STORE

LOAD



LOAD USING RAM REVOLVER®

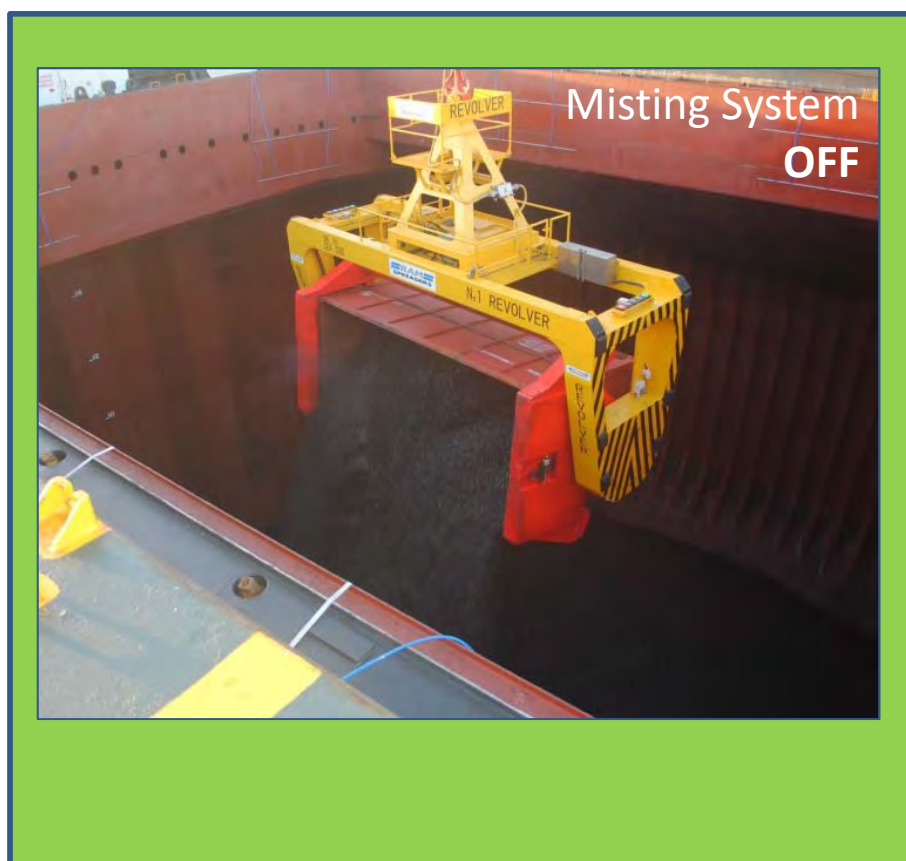
- **FOR ALL TYPES OF CRANE**
- **LOADS OF UP TO 2,000 TPH***
- **SWL – UP TO 45T**
- **LID LIFTER TECHNOLOGY –
NO CONTAMINATION – NO DUST**
- **TWISTLOCK & GRIPPERS SECURE CONTAINER
DURING ROTATION**

**subject to commodity & loading conditions*

CONTAINERISED BULK HANDLING

MISTING SYSTEM

LOADING PROCESS



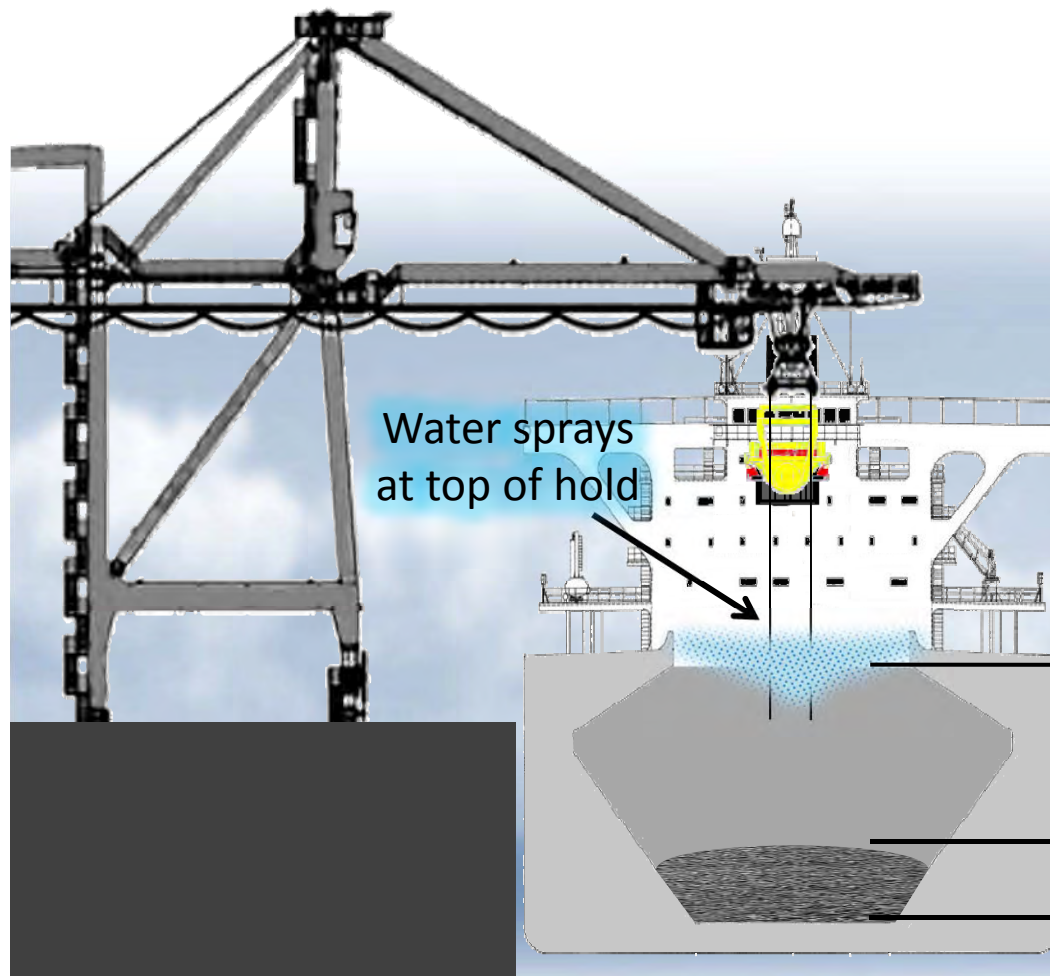
CONTAINERISED BULK HANDLING

ROTARY LOADING WITH VIRTUALLY NO DUST GENERATED

CLEANEST ORE LOADING SYSTEM AVAILABLE

MISTING SYSTEM

LOADING PROCESS



- *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

CASE STUDIES

CASE STUDY 1

COMPANY: *TRANSNET PORT ELIZABETH*

COMMODITY: *MANGANESE*

EQUIPMENT: *SHIP TO SHORE CRANE*

CASE STUDIES

CASE STUDY 1

PORT ELIZABETH



TRANSNET



Tshipi é Ntle
Manganese Mining

CASE STUDIES

CASE STUDY 1

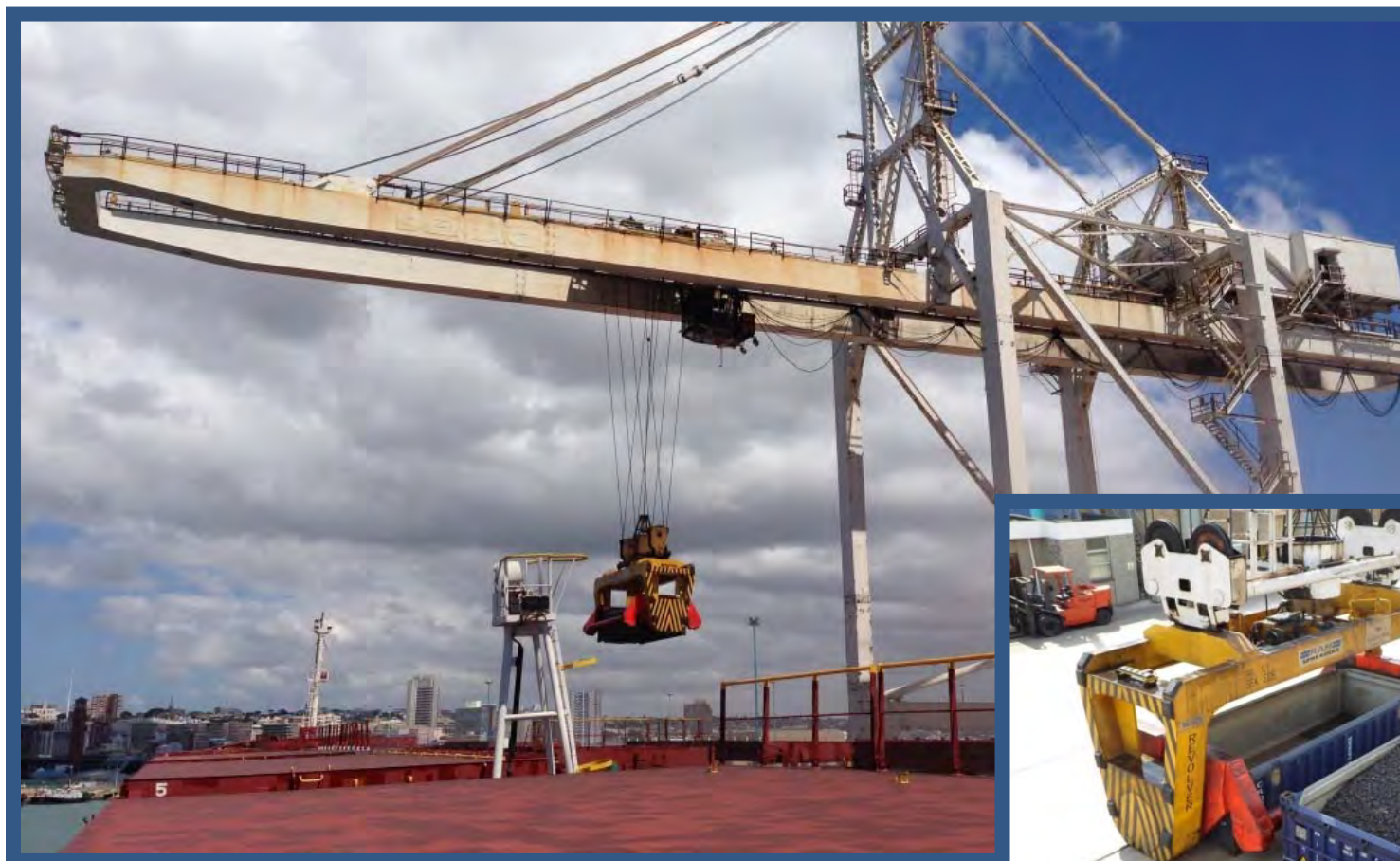
PORT ELIZABETH



CASE STUDIES

CASE STUDY 1

PORT ELIZABETH



CASE STUDIES

CASE STUDY 2

COMPANY: TPR ROSARIO

COMMODITY: GRAIN

EQUIPMENT: SHIP CRANE

CASE STUDIES

CASE STUDY 2

TPR – ROSARIO ARGENTINA

Overview

- First terminal in the world to utilize Containerized Bulk Handling (CBH) to export grain
- The terminal is a key gateway hub for Argentina, handling all types of import and export cargo

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 STUDIES

CASE STUDY 2

Fill at Farm

- Agri-bulk loaded into specially designed high cube 20' containers



TPR – ROSARIO ARGENTINA

Container as Transport and Silo

- Multipurpose use:
- Fill / Transport / Store / Empty / Re-use



CASE STUDIES

CASE STUDY 2

The Problem

Contamination of commodity

Open stockpiles at risk of 'spoil' due to:

- Contamination from vermin & birds
- Moisture

TPR – ROSARIO ARGENTINA

The Solution

Contamination free

CBH contamination free process is down to:

- Commodity being stored in sealed containers
- Commodity kept secure and dry throughout the process

Contamination free – CBH system



No stockpiles = No contamination!

CASE STUDIES

CASE STUDY 2

TPR – ROSARIO ARGENTINA

Loading

- Fast loading rates with CBH
 - Minimal material loss
- Low capital investment



CASE STUDIES

CASE STUDY 2

TPR – ROSARIO ARGENTINA

The Solution

Any container terminal

- CBH system allows exporters to take grain to any container terminal

Storage - Sealed Container

- Grain stored in high cube 20' or 40' containers with lids
- No Material Loss

Portable

- Containers can be re-located to other operation port
(with rotating spreader)

CASE STUDIES

CASE STUDY 2

TPR – ROSARIO ARGENTINA



CASE STUDIES

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”

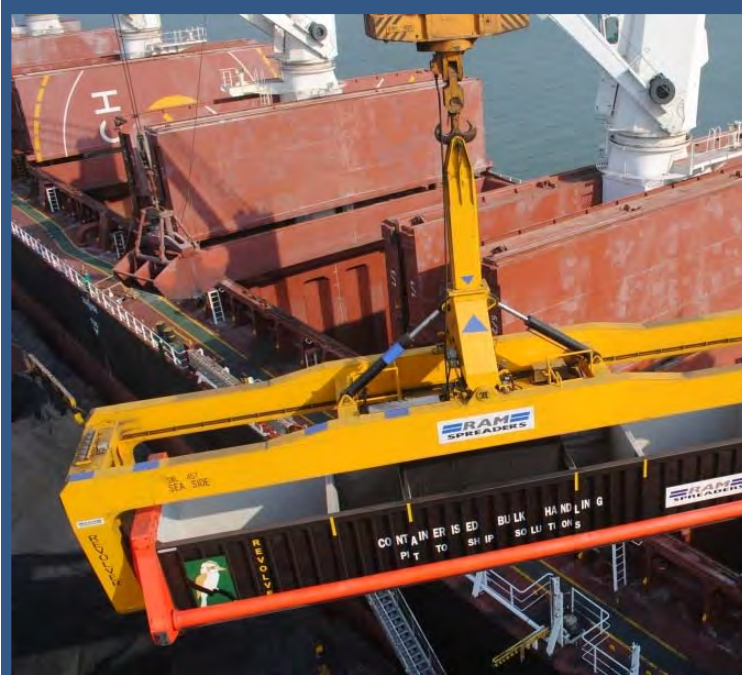


Ray Lee

Regional Director
DPW Australia
2009-2011

CASE STUDIES

FURTHER EXAMPLES



MAPUTO



COAL

IRON ORE
MANGANESE
COPPER
GRAIN

MHC CRANE

SHIPS CRANE
STS CRANE

CASE STUDIES

FURTHER EXAMPLES

EAST LONDON



COAL

IRON ORE

MANGANESE

COPPER

GRAIN

MHC CRANE

SHIPS CRANE

STS CRANE

CASE STUDIES

FURTHER EXAMPLES

ADELAIDE



COAL

IRON ORE

MANGANESE

COPPER

GRAIN

MHC CRANE

SHIPS CRANE

STS CRANE

CASE STUDIES

FURTHER EXAMPLES

CONGO



COAL

IRON ORE

MANGANESE

COPPER

GRAIN

MHC CRANE

SHIPS CRANE

STS CRANE

CASE STUDIES

FURTHER EXAMPLES

CHILE



COAL

IRON ORE

MANGANESE

COPPER

GRAIN

MHC CRANE

SHIPS CRANE

STS CRANE

CASE STUDIES

FURTHER EXAMPLES

MAURITANIA



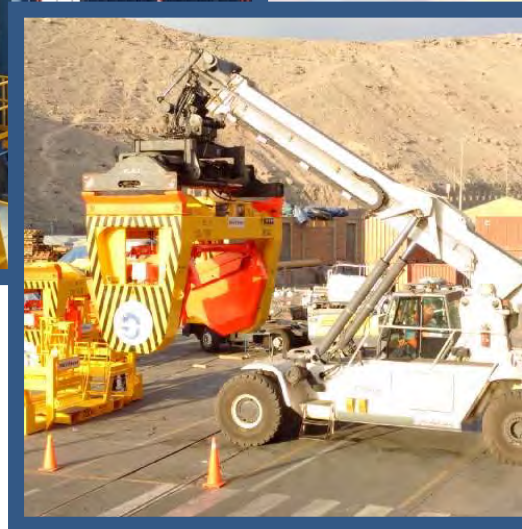

FIRST QUANTUM
MINERALS LTD.

IRON ORE

CASE STUDIES

FURTHER EXAMPLES

LAS BAMBAS - PERU



COSTINGS

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



Container Handlers



Containers



REVOLVER trailer system



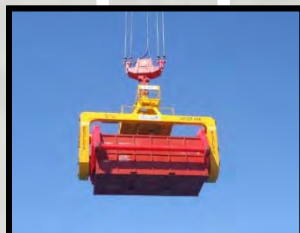
EQUIPMENT

RAM
Revolver™

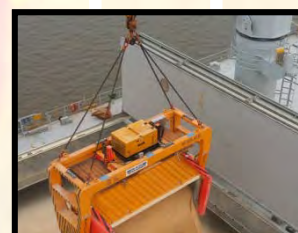
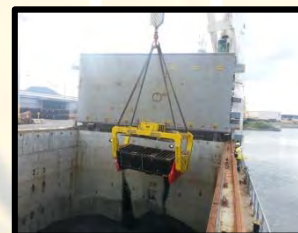
Ship to Shore



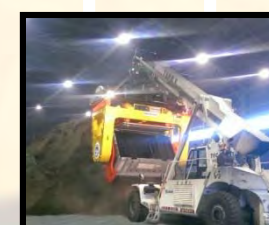
Mobile Harbour



Ship Crane



Reach Stacker



COMMODITIES HANDLED

LOAD & DISCHARGE

- Grains
- Wood Chip
- Coal
- Iron Ore
- Mineral Sands
- Copper Concentrates
- Scrap Metal
- Bagged Material
- Soya



CBH COMPANIES

JOIN THE REVOLUTION!

- *Exxaro*
- *Grinrod*
- *DP World*
- *Eletheni/ SNR*
- *BHP B*
- *Oz Minerals*
- *Hillgrove Copper*
- *Transnet*
- *FQML*
- *TPR Argentina*
- *Ironclad*
- *Patrick*



JOIN THE REVOLUTION!

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

AWARD WINNERS



***RAM Spreaders & Patrick Ports & Stevedoring
winners of the IBJ Environmental Protection Award 2014***

