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
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

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SOURCES OF DUST

TRANSFER POINT
OPEN WAGONS
OPEN STOCK PILES
SHIP LOADING
CONTAINERISED BULK HANDLING

THE 4 STAGES

1. Fill
2. Transport
3. Store
4. Unload

CBH Process
CONTAINERISED BULK HANDLING

FILL CONTAINER AT THE MINE

- EXISTING SITE EQUIPMENT USED
- NO LOSS OF COMMODITY
- NO CLEAN UP
CONTAINERISED BULK HANDLING

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

SEND CONTAINER BY RAIL

- SEALED CONTAINERS – NO DUST
- NO CONTAMINATION
- NO LOSS OF COMMODITY
CONTAINERISED BULK HANDLING

Or SEND CONTAINER BY ROAD

• USING EXISTING ROAD NETWORK
CONTAINERISED BULK HANDLING

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

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

Misting System OFF

Misting System ON

NO contamination

NO material loss
CONTAINERISED BULK HANDLING

ROTARY LOADING WITH VIRTUALLY NO DUST GENERATED

CLEANEST ORE LOADING SYSTEM AVAILABLE

- Ships hold loaded to a 3\textsuperscript{rd} 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

Water sprays at top of hold

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

Video
CASE STUDIES

CASE STUDY 1

PORT ELIZABETH
CASE STUDIES

CASE STUDY 1

PORT ELIZABETH
COMPANY:  TPR ROSARIO
COMMODITY:  GRAIN
EQUIPMENT:  SHIP CRANE
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
The Problem
Contamination of commodity

Open stockpiles at risk of ‘spoil’ due to:

- Contamination from vermin & birds
- Moisture

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

No stockpiles = No contamination!
CASE STUDIES

CASE STUDY 2

TPR – ROSARIO ARGENTINA

Loading

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

CHILE

COAL
IRON ORE
MANGANESE
COPPER
GRAIN
MHC CRANE
SHIPS CRANE
STS CRANE
COSTINGS

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

COMPARISONS

Ships Crane Model

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

= 10 MILLION

= 1 MILLION
Flexible Berths – No fixed bulk berths

- Fast to start
- No dust
- Low cost
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
COMMODITIES HANDLED

LOAD & DISCHARGE

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

• Exxaro
• Grinrod
• DP World
• Eletheni/ SNR
• BHP B
• Oz Minerals
• Hillgrove Copper
• Transnet
• FQML
• TPR Argentina
• Ironclad
• Patrick
“not often do you get a solution that is the lowest cost but also the best practice environmentally”
RAM Spreaders & Patrick Ports & Stevedoring
winners of the IBJ Environmental Protection Award 2014