# **Containerised Bulk Handling**



Case Studies of Ports adopting innovative systems to stop dust pollution

**Presented by:** 

Frank Van Laarhoven Senior Sales Manager – Europe | RAM Spreaders





#### **GHANA**

- 71<sup>st</sup> largest export economy in the world
- Over the last decade has been one of the fastest-growing economies due to expanse of agricultural production and coffee exports.
- A projected growth of 8.3 and 8.9 percent in 2018 outpacing other countries.
- Exports \$16 billion to countries such as Switzerland, UAE, India, China and The Netherlands.
- Imports \$12 billion from countries such as China, UK, USA, India, Belgium-Luxembourg creating a \$4billion trade balance



#### **GHANA**

# Ports

MI26SISH

Ghana has 6 ports ranging in size and capacity along the coast of the Gulf of Guinea: Port of Saltpond Port of Tema Port of Sekondi Port of Takoradi Port of Accra Port of Elmina

Each serving a purpose, helping to support Ghana's growing economy



#### INNOVATIONS

# **Encourage Innovation**

Over the years, the port industry has changed significantly as they are becoming increasingly dependent on technological innovations in order to remain competitive.

The competitiveness of ports depends on their ability to **innovate** in terms of technology, organisation and management....

...and to also protect the environment that surrounds them.



#### **BULK HANDLING**

# **Long Term Competitiveness**

In order to remain competitive, many standard container terminals are looking at ways to handle bulk commodities...

...but a number of factors can restrict their progress:

- Lack of space available to expand into bulk handling operations
- Limited funds to develop the port to accommodate stockpiling
- Infrastructure to cope with demand
- Environmental Impact



#### **AIRBORNE POLLUTANTS**

# The exposure to harmful airborne pollutants

Workers involved in day to day handling of certain types of bulk are exposing themselves to harmful airborne pollutants.

Over time, this can lead to serious respiratory problems that can result in lung diseases such as:





#### **AIRBORNE POLLUTANTS**

# In order to reduce airborne pollution and meet global environmental guidelines...

...bulk ports, terminals and bulk commodity handling facilities are having to find ways to reduce the levels of dust generated during the handling and unloading of bulk commodities.







And the same of



MG 01"











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# During these processes the commodity is handled <u>multiple times</u> resulting in losses and dust!





# Dust is generated <u>at any point</u> in the logistic cycle when energy is added to materials





Many companies are now looking at systems <u>to reduce</u> levels of contamination, but also cost effective systems to meet current environmental guidelines

**7£€** 

#### FILL | TRANSPORT | STORE | LOAD

# Containerised BULK HANDLING

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## A NEW METHOD OF HANDLING BULK

# A new method to export bulk is available

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





# The CBH system uses: Sealed containers for storage and transport...

# ...by rail



# ...by road

TRANSAUTE



# ...or both

# (bi-modal)

of the



# The CBH system also uses:

# RAM Revolver® Rotating Spreader



# That...

# Handles the container



# Lifts the lid





# **Rotates the container**



# And is suitable for all types of crane...















FILL

SEAL

**STORE** 

LOAD

TRANSPORT

#### **CONTAINERISED BULK HANDLING**



# SEND CONTAINER by RAIL

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







# 5

FILL

SEAL

## TRANSPORT

**STORE** 

## LOAD

# Or SEND CONTAINER by ROAD

• USING EXISTING ROAD NETWORK





# 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



# 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



# MISTING SYSTEM



# MISTING SYTEM



MISTING SYSTEM

 Image: Contamination material loss



#### LOADING PROCESS





# 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: Riga Universal Terminal

COMMODITY: Biomass

EQUIPMENT: MHC Crane



#### CASE STUDY 1

Riga Universal Terminal (RUT) became **the first** terminal in Europe to introduce the **Containerised Bulk** Handling system.

> Since it's introduction RUT have <u>doubled</u> their biomass export to cope with the increased demand and bring in new levels of revenue.


With the system capable of lifting 40 cubic meters per cycle, RUT utilized their existing MHC

...and projected a **30 lifts per hour** capacity

allowing them to handle large volumes of biomass per hour

MOVES PER HOUR 30.00

TONNES PER HOUR



The main benefit from introducing the new technology is a significant optimization of terminal expenses and an increase in performance.

> Now we can perform dry bulk handling operations involving a significantly smaller number of machines and human resources.



Atis Šulte Sales & Business Development Director Saving on resources amount to almost 50%, he added.



COMPANY: Transnet Port Elizabeth COMMODITY: Manganese EQUIPMENT: Ship to Shore Crane



# PORT ELIZABETH **South Africa**









TRANSNEL

#### **CASE STUDY 1**

#### **PORT ELIZABETH** South Africa











#### 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



COMPANY: TPR Rosario COMMODITY: Grain EQUIPMENT: Ship Crane



# **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.





# **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.** 





# **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





# **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 <u>sealed</u> containers
- Kept secure and dry throughout the process

#### **Lid on Container**

 Lifted <u>only</u> during rotation of commodity into the ships hold





# **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



# **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



COMPANY: Patrick Ports & Stevedoring COMMODITY: Copper Concentrate EQUIPMENT: Ship Crane







# CASE STUDY TESTIMONIALS



# **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".



**Ray Lee** Regional Director DPW Australia | 2009-2011

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

**DPW Adelaide** 



# ...and terminal growth

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



**Ray Lee** Regional Director DPW Australia | 2009-2011

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

# **DPW Adelaide**



# Low capital expenditure

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



Adrian Howard Commercial Director Patrick Ports & Stevedoring

*"Our Client was extremely pleased with the dust free solution"* 

# Patrick | Asciano



# High loading rates minimize shipping costs

#### **Miners Perspective**

"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" high sector sect

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

## North Park Mines



#### LATVIA



COAL IRON ORE MANGANESE COPPER

GRAIN

#### **MHC CRANE**



#### COAL

IRON ORE MANGANESE COPPER GRAIN

#### **MHC CRANE**





#### COAL

IRON ORE MANGANESE COPPER GRAIN

#### **MHC CRANE**

SHIPS CRANE STS CRANE BRIDGE CRANE REACH STACKER

#### EAST LONDON





#### ADELAIDE





#### CONGO

#### COAL

#### **IRON ORE**

MANGANESE COPPER GRAIN

#### **MHC CRANE**

#### SHIPS CRANE

STS CRANE BRIDGE CRANE REACH STACKER





#### CHILE

#### COAL IRON ORE MANGANESE

#### COPPER

GRAIN

#### **MHC CRANE**





#### MAURITANIA



COAL IRON ORE MANGANESE COPPER GRAIN



#### LAS BAMBAS - PERU



COAL IRON ORE MANGANESE

COPPER

GRAIN

MHC CRANE SHIPS CRANE STS CRANE

BRIDGE CRANE REACH STACKER



#### BOLIVIA

area apCOAL IRON ORE MANGANESE COPPER GRAIN

OTHER





#### TURKEY

COAL IRON ORE MANGANESE COPPER GRAIN

OTHER









#### **ARIZONA / MEXICO**



COAL IRON ORE MANGANESE COPPER GRAIN

OTHER



#### COSTINGS

#### **CBH - COMPARISONS**

#### MHC model

	<ul> <li>Cranes x 2 =</li> <li>Containers x 30 =</li> <li>CHE =</li> <li>Revolver's =</li> </ul>	USD\$ 8,000,000.00 USD\$ 300,000.00 USD\$ 500,000.00 USD\$ 1,500,000.00
* 1		= 10 MILLION

#### Ships Crane model



<b>9</b>	Revol	ver's	x 2	? =

- Misting System = USD\$
- Container =
- Fork Truck =
- USD\$ 800,000.00 USD\$ 200,000.00 USD\$ Leased USD\$ Leased
  - = 1 MILLION



#### **CONTAINERISED BULK HANDLING - BENEFITS**

# Flexible Berths – No fixed bulk berths











#### **CONTAINERISED BULK HANDLING - 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** trailer system





# **EQUIPMENT APPLICATION**





## **COMMODITIES HANDLED**





#### **CBH COMPANIES**



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

RAME



#### **AWARD WINNING**





Containerised Bulk Handling with RAM Revolver® is recognized by the bulk handling industry as an innovative and environmentally friendly solution

IBJ - 2014

#### **Environmental Protection Award**



For contamination & dust free Containerised Bulk Handling

SROUP COMPANY

IBJ - 2016**Innovative Technology Award** 



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