



# CONTAINERISED BULK HANDLING

The next generation in clean bulk ports

*Case Studies of bulk handling systems to stop dust pollution*



*Frank van Laarhoven*

## Who we are?

Established in 1972, we are a leading manufacturer and supplier of container handling equipment for ports and terminals...

**RAM**  
SPREADERS

## Who we are?

We entered the bulk handling market in 2011 with *Revolver* rotating spreader...



**WorldCargo** news

Enter a search term

Ports & Terminals Cargo Handling Equipment Shipping & Logistics ICT Automation Multimodal Container Industry Refrigeration

### RAM launches "Revolver" bulk handling spreader

News 04 May 2011

RAM Spreaders has come up with a new tipping spreader for lifting and tipping the contents of bulk containers

in [Twitter](#) [Facebook](#)

Three units of the patented Revolver spreader have been delivered to DP World Adelaide for handling containerised iron ore shipments from the Australian mining company IMX.

The units will be deployed over the lifetime of contract loading around 70,000t of iron ore onto the vessel each voyage.

The units at DPW allow containers filled with iron ore to be lifted and tipped into the hold of a vessel. The containers are handled within the port, by rail and at the mine with standard container handling equipment such as straddles and reach stackers.

The project has allowed IMX to export its product quickly with low capital investment whilst meeting all the strict environmental requirements and has allowed DP World to develop new business.



## Who we are?

Supplying the Revolver CBH system for various types of crane application from MHC, STS, Ship, Bridge Crane & Reach Stacker

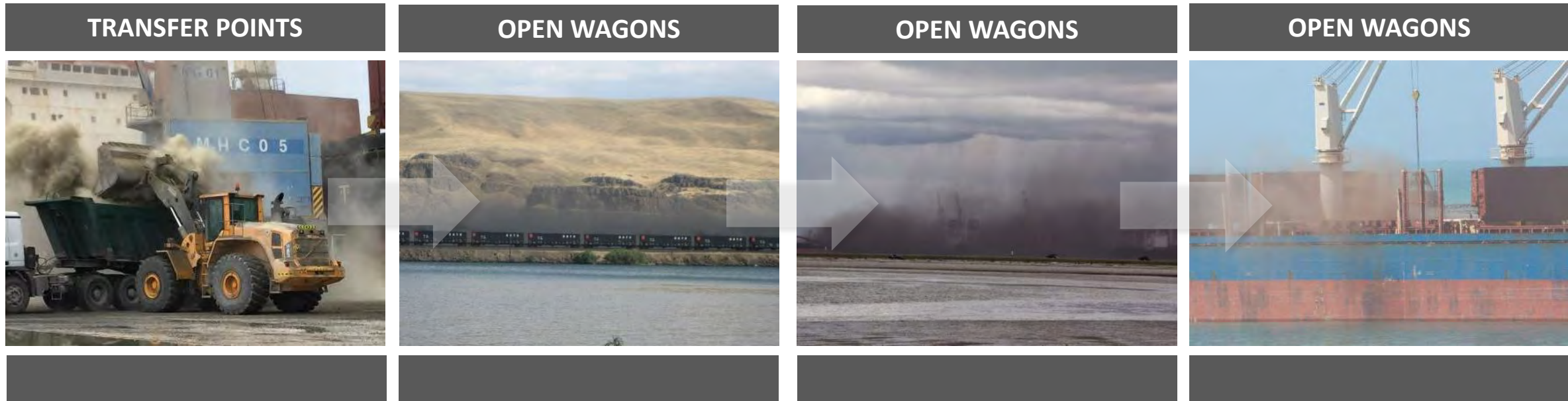


A large, faded background image of a heavy-duty truck, likely a spreader, with a large hopper and a spreading mechanism. The truck is shown from a side profile, facing right. The background is a light, hazy grey.

## Current Bulk Handling Logistics

## Current Bulk Handling Logistics

The commodity is handled multiple times during the logistics cycle



## Current Bulk Handling Logistics



### But can it be sustained over time?

Dust is generated at any point in the logistics cycle

When energy is added to the material

Resulting in pollution and loss of valuable commodity

Commodity



Energy



Dust



Pollution



Loss of commodity

## What can we do?

In order to meet current environmental guidelines, many companies are now looking at systems not only to reduce levels of contamination, **but** also cost-effective systems.





### A competitive edge for container ports & terminals?

Many standard container terminals **are also** looking at ways to handle bulk commodities to remain competitive, **but a number of factors can restrict their progress:**

- **Lack of space**  
to expand into bulk handling operations
- **Limited funds**  
to develop the port to accommodate stockpiling
- **Infrastructure**  
to cope with demand
- **Environmental impact**  
with many ports close to residential or coastline attractions



**Is there a solution?**



## Containerised Bulk Handling



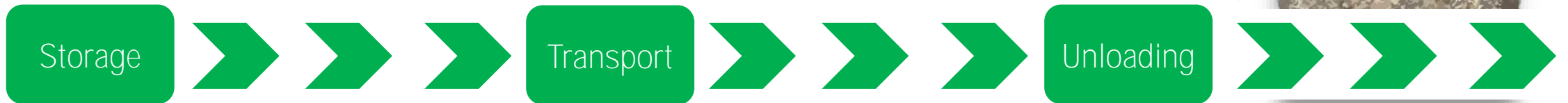
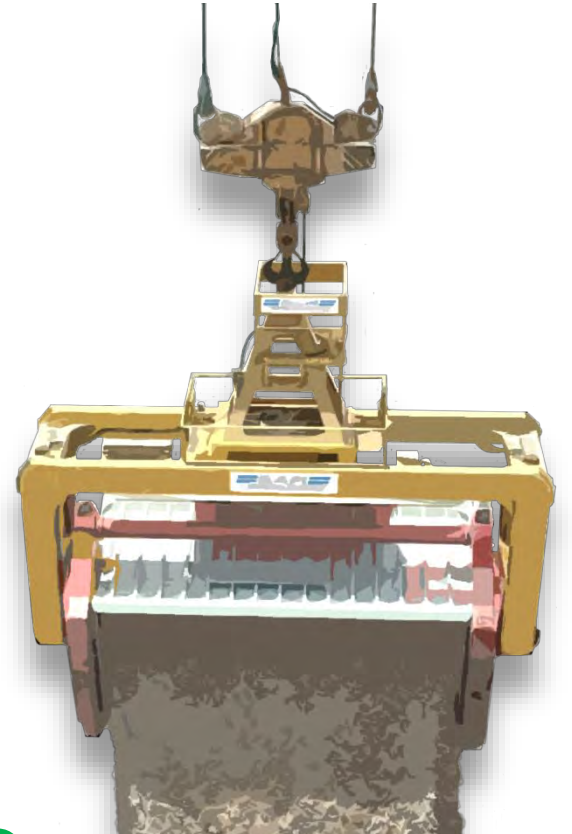
*Containerised  
Bulk  
Handling*

*FILL | TRANSPORT | STORE | LOAD*



## So what is the CBH System?

Sealed open-top containers are used for:



## So what is the CBH System?

Transport of commodity is done by:



**ROAD**



**RAIL**



**OR BOTH  
(BI-MODAL)**

## Containerised Bulk Handling

### How does it work?

Using a 4 stage process, bulk is handled with minimal transfer points...

..resulting in a reducing loss of commodity and contamination than conventional bulk handling processes

1. **Fill** container at facility or mine
2. **Transport** container by road or rail
3. **Store** containers ready for unloading
4. **Unload** with rotating spreader



# Containerised Bulk Handling

1



**Fill & Seal** container

- Existing equipment used
- Self-locking lid system
- No loss of commodity
- No clean up
- No contamination

2



**Transport** container by rail or road

- Sealed containers – No dust!
- No contamination
- No loss of commodity
- Existing infrastructure used

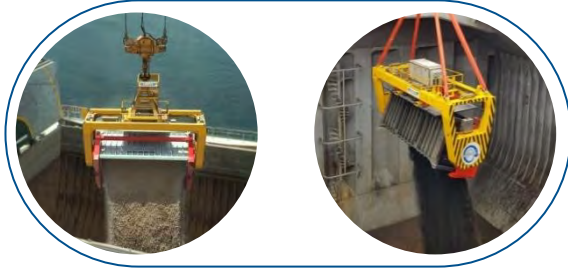
3



**Store** containers at port or facility

- Fast & effective loading
- No stockpile – No dust
- No contamination of commodity
- Store multiple types of commodity in the same area with no cross contamination

4



**Unload** using Rotating Spreader

- For all types of crane
- Loads of up to 1,000TPH \*
- SWL up to 45T \*
- Twistlock & grippers secure the container during rotation

\*Loads & SWL typical with using RAM's Rotating Spreader 'Revolver'

## Containerised Bulk Handling

### Can CBH be used on all types of crane?

Bulk rotating spreaders, such as 'Revolver' are available for all types of crane, from MHC's to Reach Stacker's

**MHC****STS CRANE****SHIP CRANE****BRIDGE CRANE****REACH STACKER**



## Containerised Bulk Handling

### What equipment do I need for CBH?

#### Rotating Spreader



#### Misting system (optional)



## Containerised Bulk Handling

### What equipment do I need for CBH?

#### CONTAINERS



**EQUIPMENT NEEDED  
AT THE MINE/BULK PRODUCER**

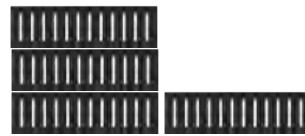
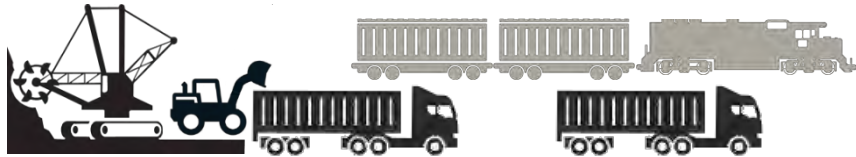


**HOW FLEXIBLE IS IT?**

# Containerised Bulk Handling

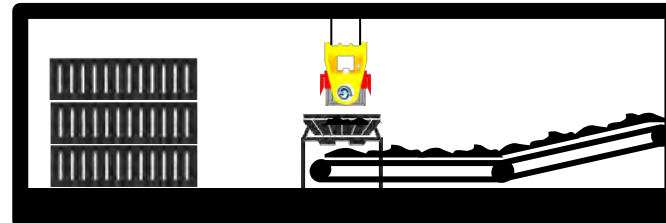
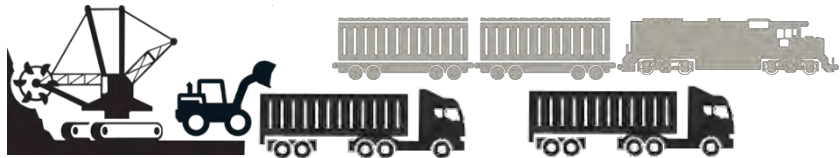
## EXPORT

### Pit to Ship



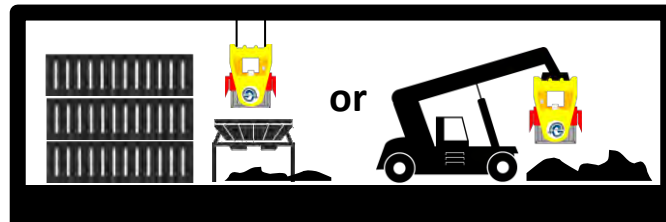
Fill at mine | Transport | Stack containers at port | Lift & unload directly into ships hold

### Pit to Ship Loader



Fill at mine | Transport | Store containers in port's shed | Lift & unload onto conveyor ship loader

### Pit to Shed

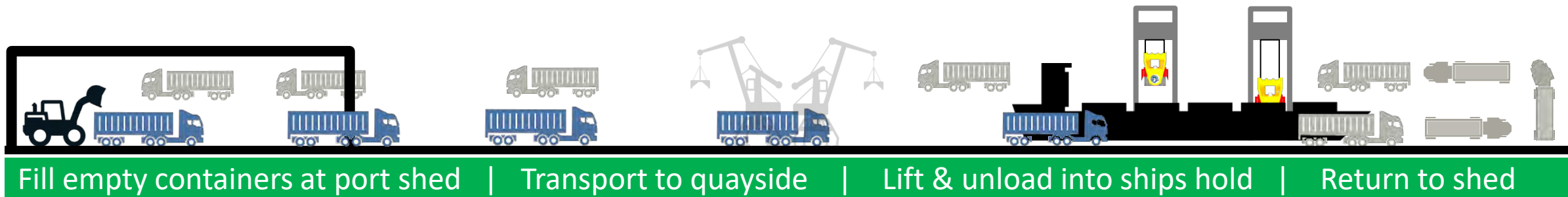


Fill at mine | Transport | Lift & unload into shed at port of facility

## Containerised Bulk Handling

### EXPORT

#### Shed to Ship (Internal Truck Loop Operations)



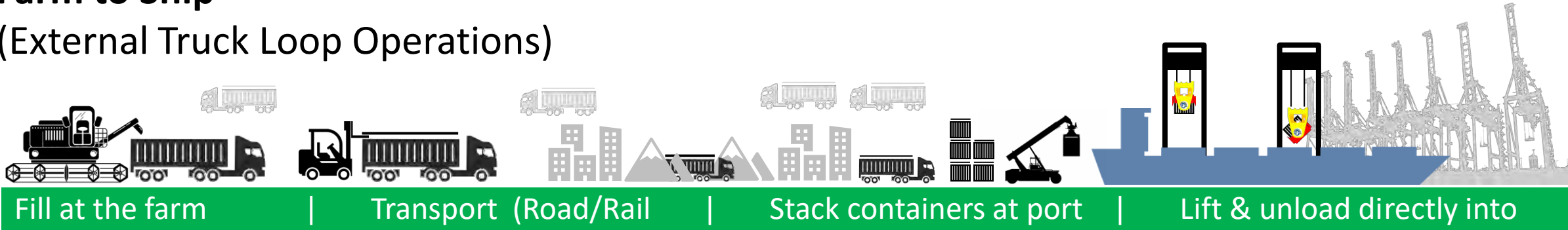
#### Shed to Ship (External Truck Loop Operations)



# Containerised Bulk Handling

## EXPORT – GRAINS

### Farm to Ship (External Truck Loop Operations)



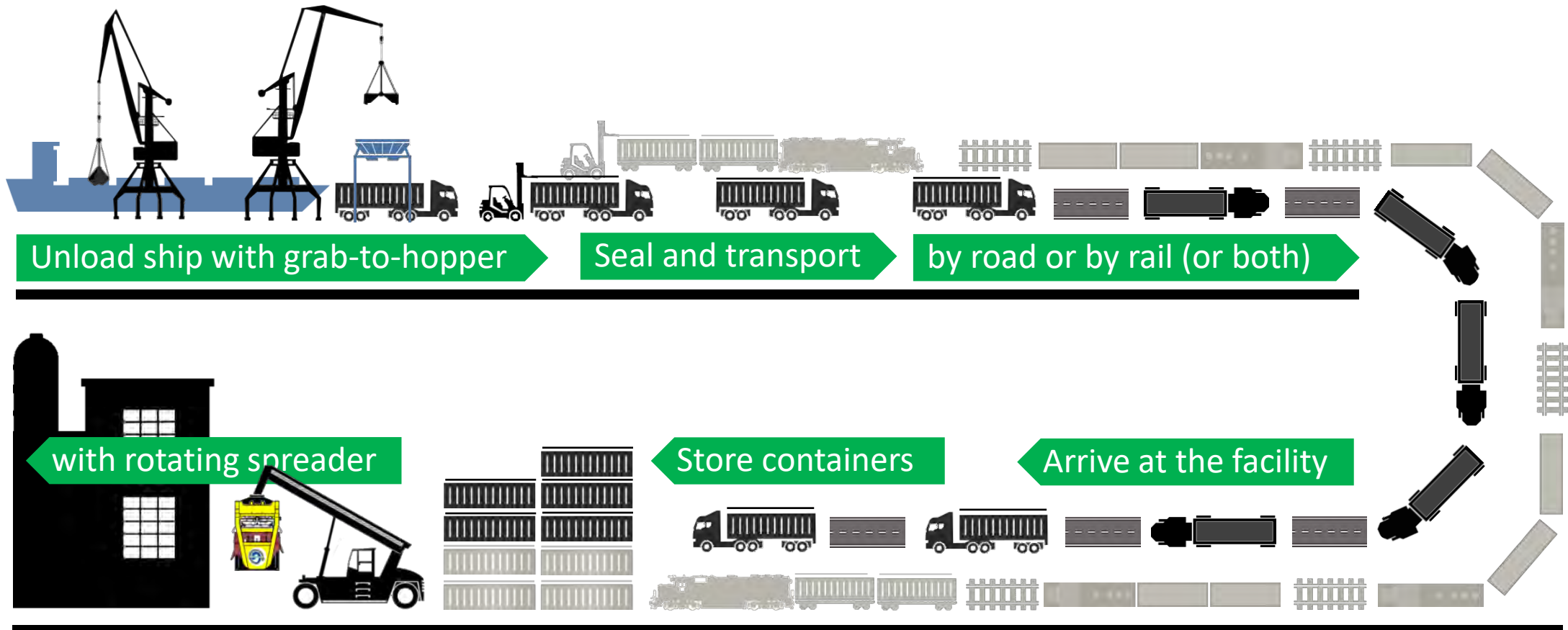
### Farm to Shed (Internal Truck Loop Operations)



## Containerised Bulk Handling

### IMPORT

### Ship to Shed/Processing Facility



**CBH**  
**4 stage**  
**process**

**Fill container at the mine or facility**  
**Seal with lid**  
**Transport**  
**Load at final destination**



**RAM**  
**SPREADERS**



## Containerised Bulk Handling

### Benefits for Terminals

**Gain new customers**

*Use existing equipment* ✓

**Flexible berths**

*No fixed bulk berth* ✓

**No dust**

*No local complaints* ✓

**Low cost**

*No expensive infrastructures* ✓

**Proven**

*High productivity* ✓



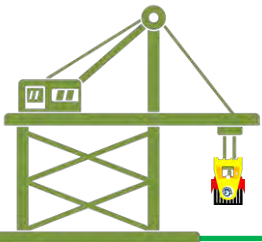
# CASE STUDIES

## Case Study

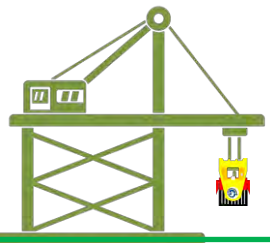
**COMPANY:** Transnet Port Elizabeth

**COMMODITY:** Manganese

**CRANE:** Ship to Shore



## Case Study



## Case Study

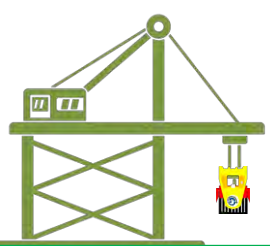


## Case Study



CONTAINER & CBH BULK HANDLING TERMINAL

VEHICLE EXPORT TERMINAL

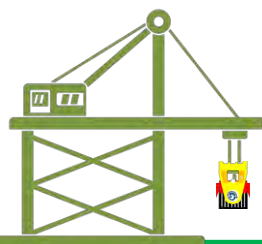


# Case Study



CBH has been in operation since 2014 at Port Elizabeth Container Terminal

Handling an increasing large volume of bulk, in 2019 Transnet Port Terminals (TPT) placed a repeat order for a further 4 units of RAM CBH



## Dust Free Loading in Port Elizabeth

Delivery of 4 Revolver® spreaders helps Transnet Port Terminals commit to its sustainability agenda and reduce dust.

April 2019



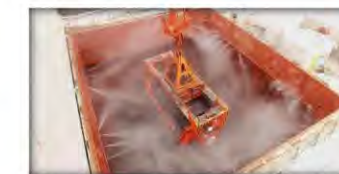
### Summary

Following the introduction of Containerised Bulk Handling at Port Elizabeth Container Terminal (PECT) in South Africa, Transnet Port Terminals (TPT) placed a repeat order with RAM spreaders of 4 units of the RAM Revolver® bulk handling spreader.



### A Route to Market for Miners

Mining companies are now able to find a new route to market using CBH for exporting bulk through standard container terminals, which until now has only been possible with heavy investment and an expensive infrastructure.



TPT handles large volumes of bulk exports annually at its Port Elizabeth Container Terminal and recently employed containerised bulk handling. The terminal invested in 4 units of RAM Revolver®, to help them service their base of customers better.

### Clean & Green!

PECT is located near to the main town of Port Elizabeth and like all cities dust is a sensitive issue.

The Containerised Bulk Handling system, using a hatch misting system is the greenest loading system in the world with zero fugitive dust emissions. It achieves this through a 2 pronged method:

1. The Revolver® adds very little energy to the bulk material as it tips at the very bottom of the hatch.
2. A hatch based dust suppression system mounted on the hatch, which stops any small amount of dust from rising up.



### Flexible Approach & Clever Use of Capital

Containerised Bulk Handling (CBH) allows for easy handling of bulk materials with a simple spreader change on the cranes. The cost of the CBH system is a fraction of the cost of new bulk loaders.

Speaking at the handing over ceremony of the Revolver's, RAM Spreaders Cameron Hay commented "Since the first order of Revolvers in PE more than 5 years ago the CBH system has grown significantly. These new revolvers will allow TPT to ensure environmental compliance"

[www.ramspreaders.com](http://www.ramspreaders.com)

### Local Community—Supporting Local School

RAM Spreaders & Transnet Port Terminals are both socially aware companies, who as a result of the bulk handling project, are helping to support the local community by employing a number of local technical staff and provide training programs to help further their skills in this new technology.

The local Green Apple Pre-school close to the Port Elizabeth Container Terminal is also benefiting from the new project, with RAM & TPT helping to subsidise teachers and provide funding to help the school add three new classrooms. This will allow more children in the area to receive a decent foundation education and in turn help the local area continue to prosper.

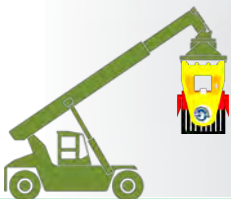


## Case Study

**COMPANY: Eti Bakir**

**COMMODITY: Pyrite & Copper Concentrate**

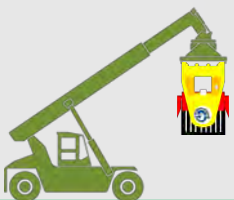
**CRANE TYPE: Reach Stacker & Bridge Crane**





## Case Study

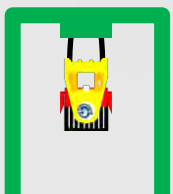
Turkey's largest mining and metallurgy operations company Eti Bakir turned the tables on their bulk handling operations by introducing RAM Revolver CBH for their Mazidagi and Samsun Plants.



## Case Study

### Mazidagi Plant

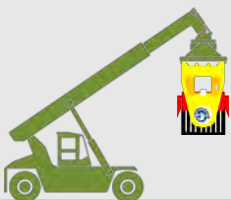
Eti Bakir used their existing hopper/conveyor system with RAM's Rotating Spreader 'Revolver' at their Mazidagi plant handling pyrite concentrate used for producing metal and alloys.



## Case Study

### Samsun

The same CBH system, *but on a reach stacker application*, is also used at their Samsun plant in the Tekkekoy region handling copper concentrate.



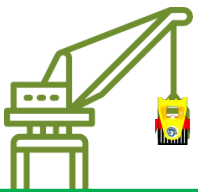
## Case Study

**“** *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.*

*Saving on resources amount to almost 50%, he added.* **”**

**Atis Šulte**  
Sales & Business  
Development Director

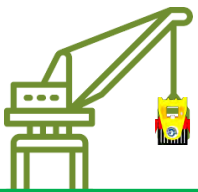


## Case Study

**LOCATION: Poti - Georgia**

**COMMODITY: Copper Concentrate**

**CRANE: MHC**



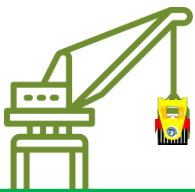
## Case Study

### Supporting local clients

CBH introduced to support local dry bulk clients

### Flexibility at the port

Using existing port equipment with CBH allows the port flexibility in handling all commodities for local companies, especially for those who import, blend and export locally mined copper concentrate



#### GREENPORT

#### EFFICIENT SPREADER REDUCES ECO-IMPACT

14 Nov 2018

APM Terminals Poti, Georgia has commissioned a new revolving spreader to load copper concentrate into bulk vessels, improve efficiency and minimise environmental impact during bulk cargo loading operations.

At the terminal, the revolving spreader attaches to a mobile harbour crane as a regular spreader does.

The suspended spreader turns the container upside down and deposits the contents at the bottom of the vessel's hold. As the product is loaded into the vessel, a hatch-mounted misting system prevents the copper dust from being blown away.

"With this solution, we have addressed the needs of our customer, enabling both sides to become more efficient and environmentally friendly," said Klaus Holm Laursen, managing director of APM Terminals Poti. "Furthermore, with the same equipment and infrastructure, we can now expand into a market with the potential for several million tons of bulk cargo."



The spreader means that the copper concentrate avoids spillage, dusting and water contamination. Credit: APM Terminals Poti

#### Regulation compliance

To reduce spillage and wastage before being transported to the terminal, copper concentrate is loaded in reinforced open top containers covered by a tarpaulin in a closed warehouse.

The overall process is compliant with all environmental, IMO and REACH regulations as the concentrate never touches the ground, avoids spillage, dusting and water contamination, said APM Terminals Poti. It also improves worker's Health & Safety and significantly speeds up terminal and port operations and daily vessel loading rate.

There is also a clear cost and time saving. "At the traditional bulk facility, we were happy if they would load 5,000 tons in a day using three cranes. Today we experience loading of 10,000 tons in a day on a single crane," explained Michael Mogilevsky, founder of Caucasian Metals Terminal, APM Terminals business partner in this operation.

"We are seeing not only more product actually being loaded with less environmental impact, but we are also experiencing a cost advantage on the number of days we need to charter the vessel," added Mr Mogilevsky.

## Case Study

### **A safe and secure way to handle bulk**

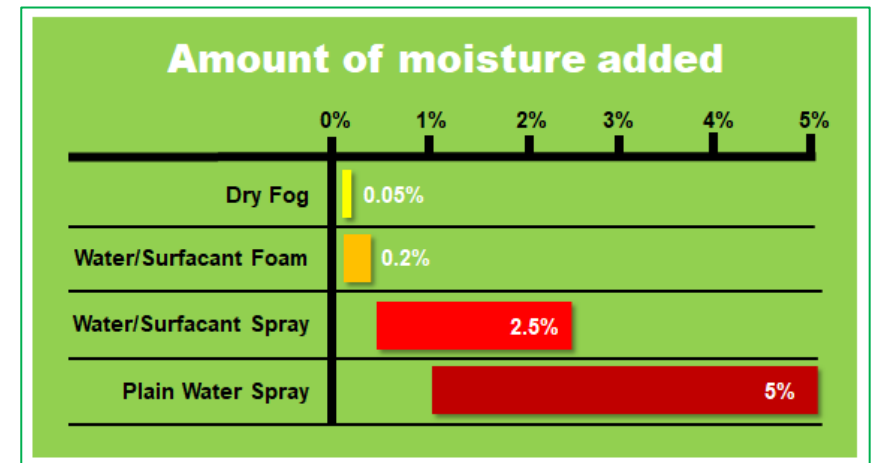
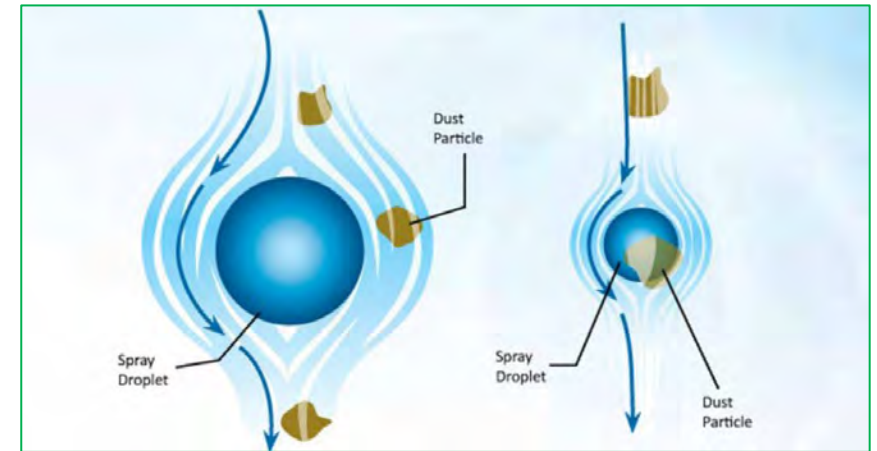
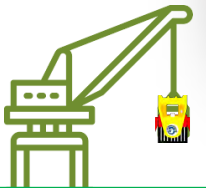
Handling dry bulk from the port using CBH, is *environmental best practice*.

Ports, such as Poti located close to a residential area, schools and recreational park, can handle dry bulk cleanly and safely with no harm to the environment or commodity.



## Case Study

CBH *adds very little energy* to the bulk material when unloded, and a dust suppression misting system contains the dust plume within the ships hatch





# TESTIMONIALS

## 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”.*

*“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 Testimonials

### ...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 Testimonials

### 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”*



**Adrian Howard**  
Commercial Director  
Patrick Ports & Stevedoring

Patrick | Asciano

## Case Study Testimonials

### 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**”*

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



**Jack Cole**  
North Park Mines

**North Park Mines**

## Case Study – Further Examples

### MOBILE HARBOUR CRANE



RUT Latvia - Grain



South Africa- Coal



Chile – Copper/ Potassium Salt



Maputo - Coal



Congo – Iron Ore



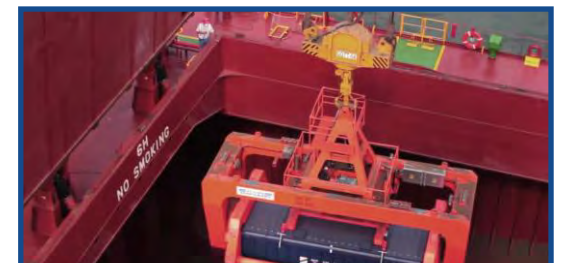
Chile – Copper/Zinc



Cuba - Zinc



USA – Wood Chip/Pellet



Mexico – Lead/Copper/Zinc

## Case Study – Further Examples

### BRIDGE CRANE & REACH STACKER



Peru - Copper



Mauritania - Magnetite



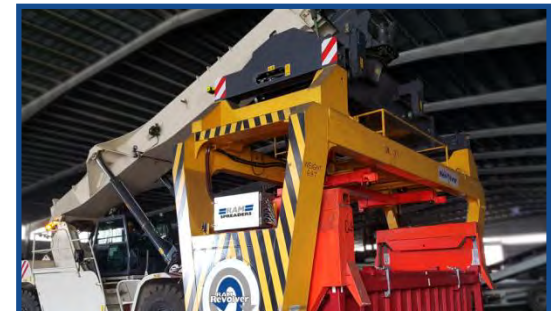
Bolivia - Urea



Turkey - Copper



Chile - Copper



Arizona/Mexico - Copper

## Case Study – Further Examples

**SHIP AND  
STS CRANE**



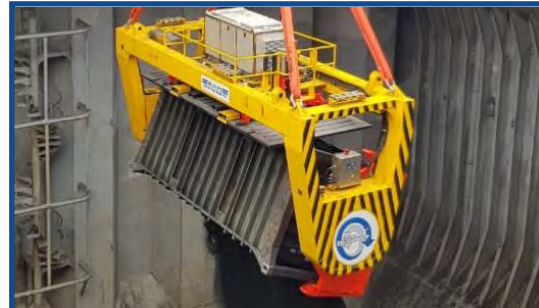
Argentina – Soya/Rice



South Africa- Manganese



Australia - Copper



Chile - Zinc



Argentina - Grain



Australia – Iron Ore



USA – Wood Chip/Pellet



## The many benefits of Containerised Bulk Handling

**C**ontainerises the bulk

**L**ow set up cost

**E**nvironmentally friendly

**A**ward winning solution

**N**o contamination

## The many benefits of Containerised Bulk Handling

- ✓ Expand market opportunities for terminals
- ✓ Provides cost effective alternative logistics to shippers
- ✓ Innovative turnkey solution to industry
- ✓ Provides shipper and countries a faster route to market
- ✓ Implement “best practices” into the industry to attract business
- ✓ Responsible care for environment – good business ethic

## Commodities Handled



## Containerised Bulk Handling Operators

