

**RAM**  
SPREADERS



*Frank van Laarhoven*

## CONTAINERISED BULK HANDLING



**The next generation in clean bulk ports**  
Case Studies of bulk handling systems to stop dust pollution



## Who we are?



A leading manufacture and supplier of container handling equipment for ports and terminals....

**who this year celebrate 50 years of success**



## Who we are?

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



## WorldCargo news

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### 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



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?

Selling over 80 units of 'Revolver' for various types of crane application from MHC, STS, Ship, Reach Stacker & Bridge Crane



RAM SPREADERS				
COUNTRY	REGION	MODEL	QTY	YEAR
Australia	Australasia	4110	1	2011
Australia	Australasia	4110	2	2011
South Africa	Africa	4100	2	2012
Australia	Australasia	4120	2	2012
Congo	Africa	4100	2	2013
Australia	Australasia	4131	2	2013
Mozambique	South Africa	4110	2	2013
Borwa	South Africa	4111	2	2013
Borwa	South Africa	4111	1	2013
Mauritania	Africa	4131	2	2014
Argentina	South America	4121	1	2014
Chile	South America	4121	2	2014
Argentina	South America	4131	1	2014
Chile	South America	4121	2	2015
Chile	South America	4121	1	2015
Mexico	South America	4141	1	2015
Peru	South America	4151	4	2015
Saudi Arabia	UAE	4131	1	2015
Latvia	Europe	4121	1	2016
Oman	UAE	4121	2	2016
Oman	UAE	4131	1	2016
China	Asia	4151	1	2017
Mexico	South America	4121	2	2017
Bolivia	South America	4141	1	2017
Mexico	South America	4141	1	2017
China	Asia	4151	1	2018
USA	Central America	4121	1	2018
Georgia	Eurasia	4121	2	2018
Africa	South Africa	4111	4	2018
Chile	South America	4151	2	2018
China	Asia	4151	2	2019
Bulgaria	Europe	4121	1	2019
Russia	Europe	4121	1	2019
Bahrain	Middle East	4131	2	2019
Mexico	South America	4121	2	2019
Chile	South America	4221	2	2019
Chile	South America	4131	1	2019
Indonesia	Asia	4111	2	2022
China	Asia	4141	1	2021
Canada	North America	4111	1	2021
Peru	South America	4121	1	2021
Dubai	UAE	4121	1	2021
USA	Central America	4141	1	2022
Poland	Europe	4121	1	2022
Bahrain	Middle East	4131	1	2022
Canada	North America	4111	2	2022
Chile	South America	4121	1	2022
Chile	South America	4121	2	2022
Chile	South America	4141	1	2022
Mexico	South America	4141	1	2022
Chile	South America	4151	3	2022

## Who we are?

...and are **one of the only suppliers** of containerised bulk handling solution in the Americas



## Current Bulk Handling Logistics



Can it be sustained  
over time!



## Current Bulk Handling Logistics



Can it be sustained  
over time!



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



Resulting in pollution and loss  
of valuable commodity!

## Current Bulk Handling Logistics

### Commodity loss & pollution...

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

Transfer  
Points



Open  
Wagons



Stockpiling  
Commodities



Ship  
Loading





## Current Bulk Handling Logistics

So what are the other systems available to reduce pollution, loss of commodity and meet global guidelines?



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

## Current Bulk Handling Logistics

### ...and how can container ports remain competitive?



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** available 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**

**FILL | TRANSPORT | STORE | LOAD**



## So what is the CBH System?

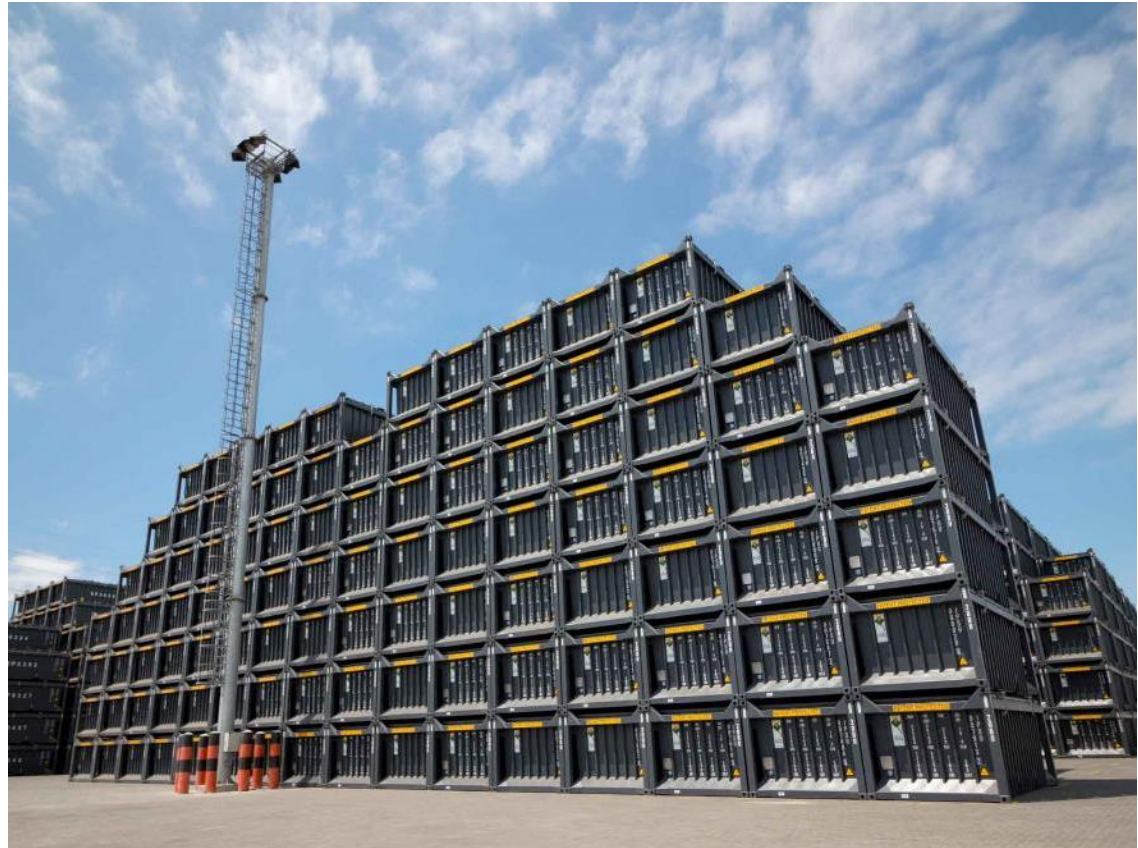
CBH uses sealed open-top containers for the:

Storage

Transport

Unloading

of bulk commodities



## 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?

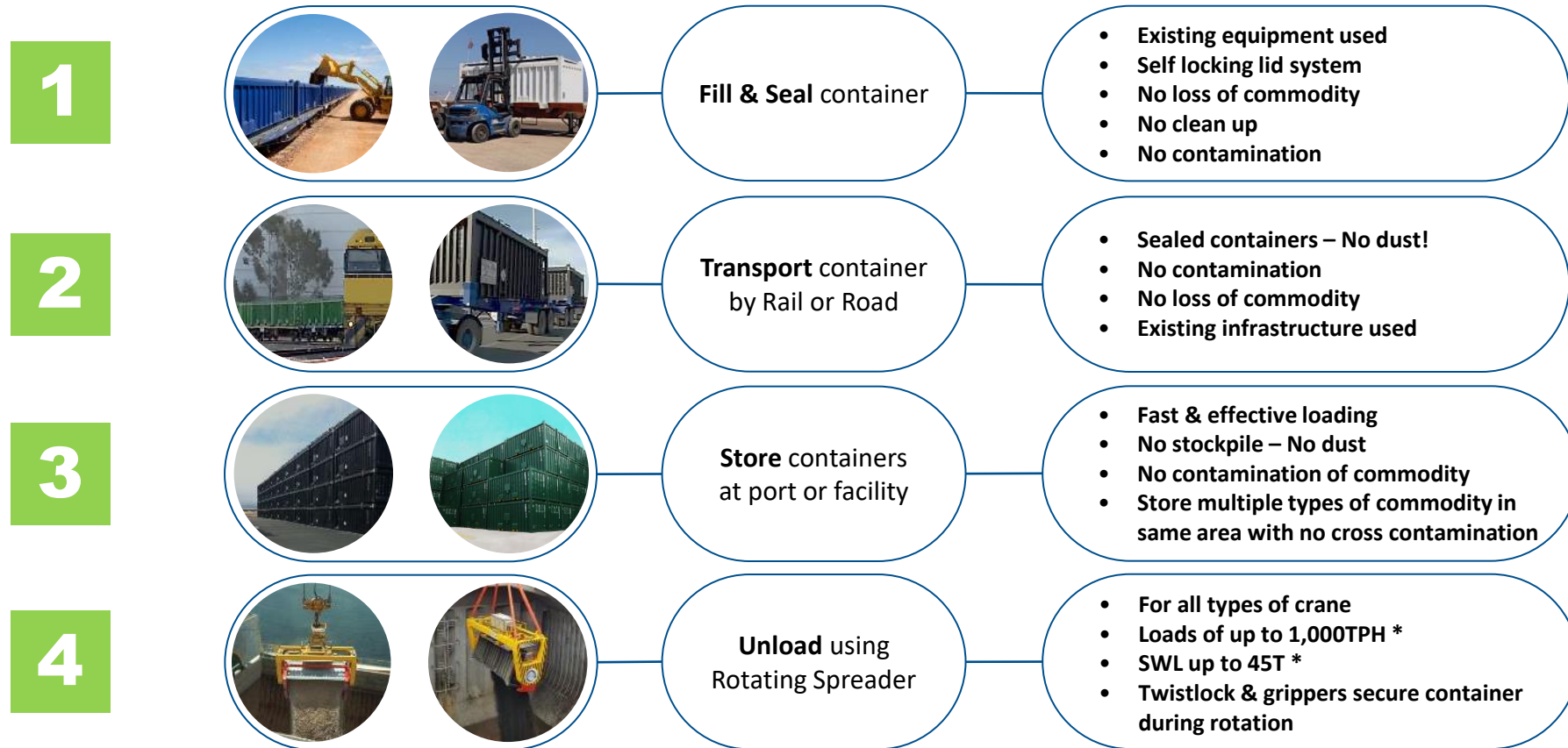
Using a 4 stage process, bulk is handled with minimal transfer points...

..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



\*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

FOR ALL TYPES OF CRANE



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**

## Containerised Bulk Handling

A large orange RAM spreader is shown in operation at a port. The spreader is lifting a container, and its boom is extended upwards. The background shows a large ship and other port infrastructure. The text "HOW FLEXIBLE IS IT?" is overlaid in the center of the image.

**HOW FLEXIBLE IS IT?**

# Containerised Bulk Handling

## EXPORT

### Pit to Ship



Fill at mine

| Transport



Stack containers at port



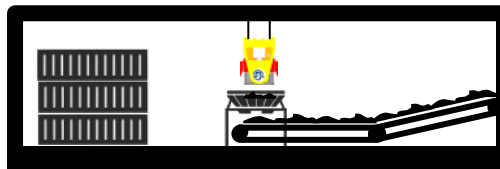
| Lift & unload directly into ships hold

### Pit to Ship Loader



Fill at mine

| Transport



| Store containers in port's shed



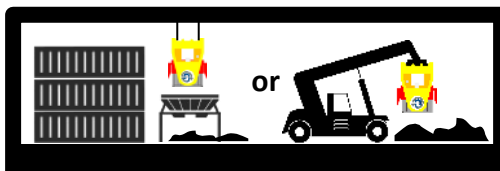
| Lift & unload onto conveyor ship loader

### Pit to Shed



Fill at mine

| Transport



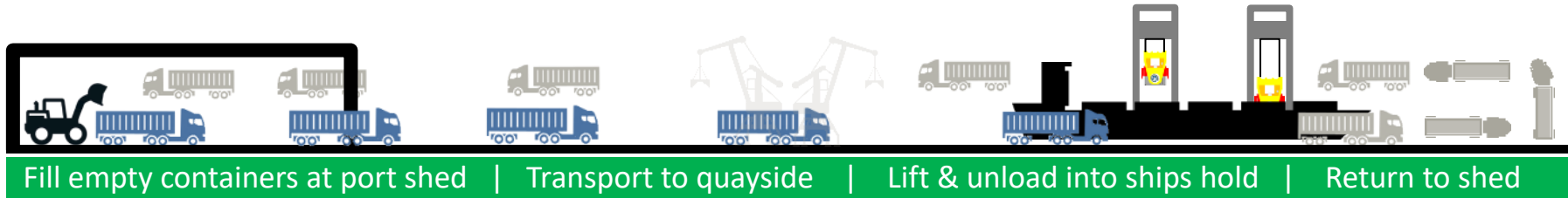
| Lift & unload into shed at port of facility



# Containerised Bulk Handling

## EXPORT

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



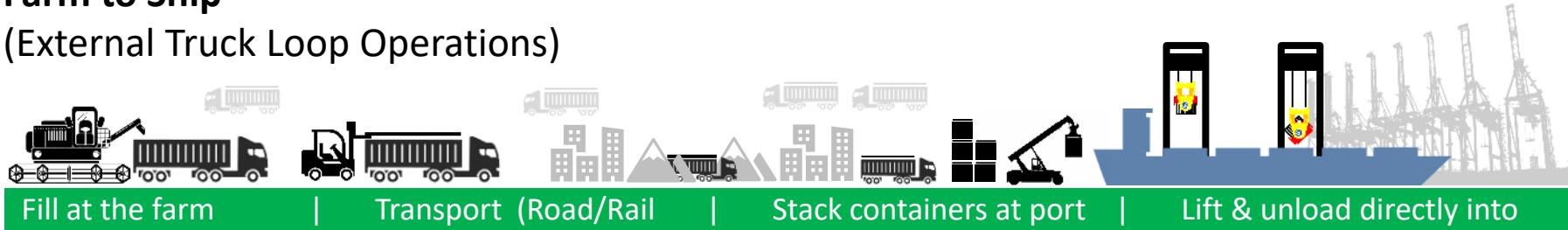
### Shed to Ship (External Truck Loop Operations)



# Containerised Bulk Handling

## EXPORT – GRAINS

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



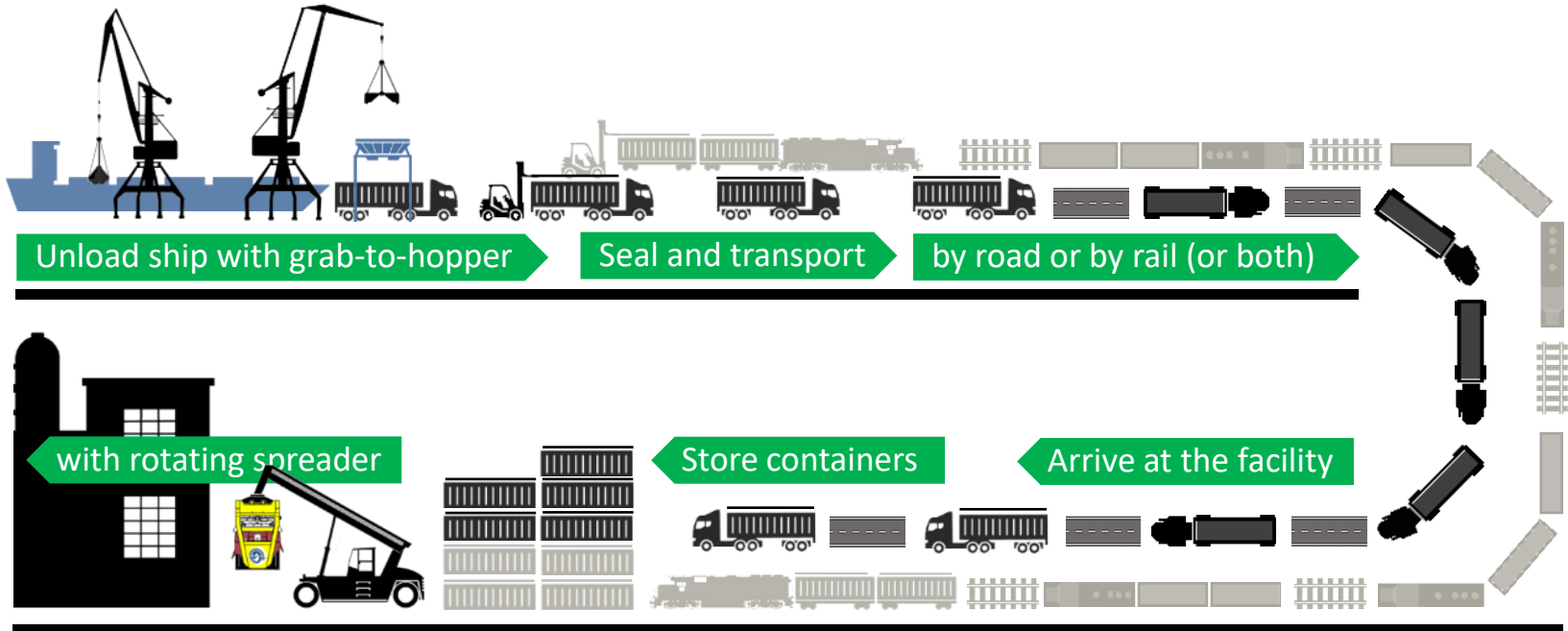
### Farm to Shed (Internal Truck Loop Operations)



# Containerised Bulk Handling

## IMPORT

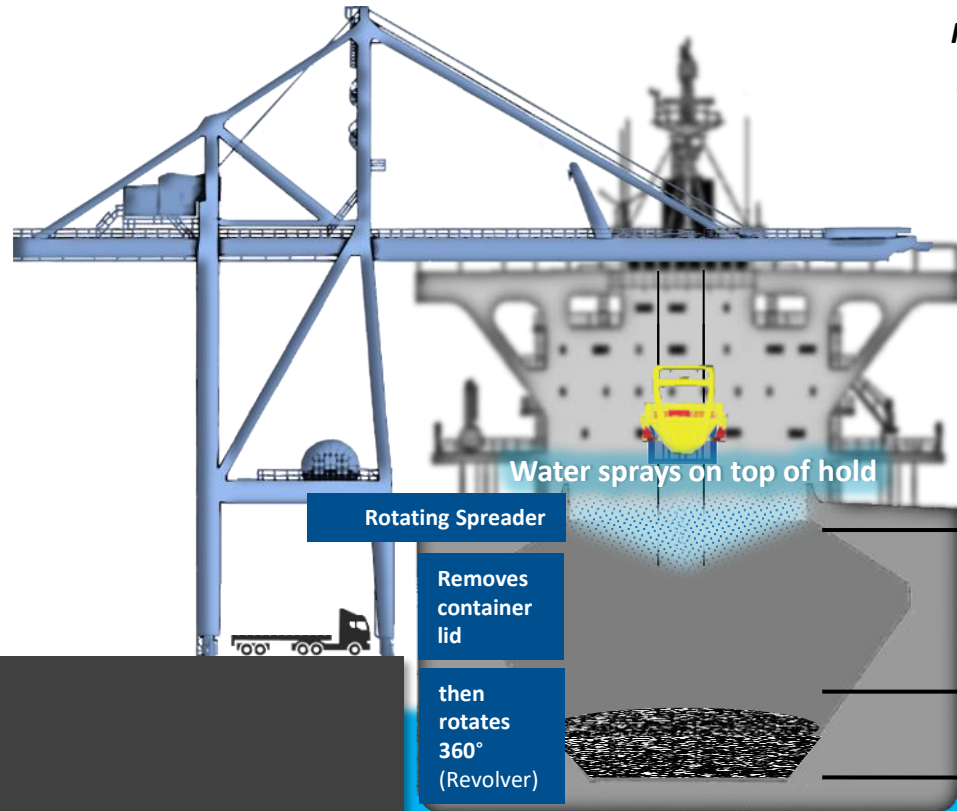
### Ship to Shed/Processing Facility



# LOADING PROCESS



# Containerised Bulk Handling



**ROTARY LOADING WITH VIRTUALLY NO DUST GENERATED**  
**ONE OF THE CLEANEST ORE LOADING SYSTEM AVAILABLE**

- Ships hold loaded to a 3<sup>rd</sup> 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 reducing dust generation

17m Total area depth

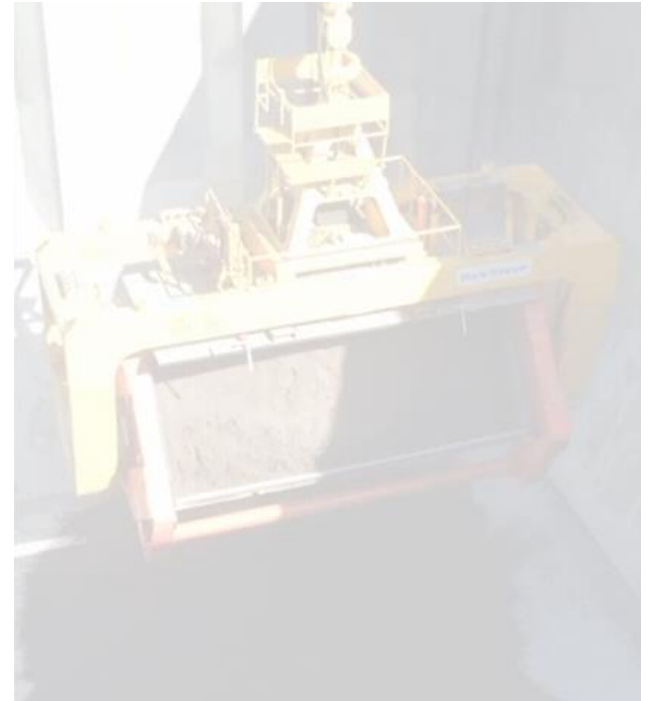
12m Air height in hold

5m Cargo depth

## Containerised Bulk Handling

### Benefits for Terminals

- ✓ **Gain new customers using existing equipment**
- ✓ **Flexible berths (no fixed bulk berth)**
- ✓ **No dust | No local complaints**
- ✓ **Low cost**
- ✓ **Proven | High productivity**



# CASE STUDIES

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## Case Study



**COMPANY:** Transnet Port Elizabeth

**COMMODITY:** Manganese

**CRANE:** Ship to Shore



## Case Study



## Case Study



CONTAINER & CBH BULK HANDLING TERMINAL



# 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 (CBCT) in South Africa, Transnet Port Terminals (TPT) placed a repeat order with RAM spreaders to enable its four RAM Revolver® bulk handling spreaders.



TPT handles large volumes of bulk exports annually at the Port Elizabeth Container Terminal and recently expanded maritime and bulk handling. The terminal invested in 4 units of RAM Revolver® to help TPT serve their base of customers better.



**Flexible Approach & Clever Use of Capital**


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

Speaking of the handling cost, secretary of the Revolver®, RAM Spreaders Canada, Greg Ackermann, "Since the first order of Revolvers in 2014, more than 6 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)

**A Route to Market for Miners**

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



**Clean & Green!**

CBCT is located next to the main town of Port Elizabeth and like all cities that is a sensitive town.

The Containerised Bulk Handling system, using a batch mixing system is the present loading system in the world with zero fugitive dust emissions. It achieves this through a 2 stage method:

- The Revolver® adds only 10% energy to the bulk material at 1.2m/s. At the very bottom of the hatch.
- A batch based dust suppression system mounted on the hatch, which strips any residual moisture of the four rotating up.

**Local Community-Supporting Local School**

RAM Spreaders & Transnet Port Terminals are both socially aware companies, so 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.

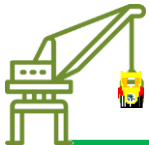
The local Green Apple Education school at the Port Elizabeth Container Terminal is also benefiting from the new project with RAM & TPT helping to subsidise teachers and provide funding to help the school add three new classrooms. This will allow more children in the area to receive a decent foundation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





## Case Study

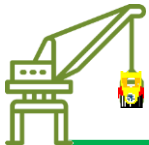
**COMPANY: RUT**  
**COMMODITY: Biomass**  
**CRANE: MHC**



## Case Study

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

Since its introduction RUT have **doubled** their biomass export to cope with the increased demand and bring in new levels of revenue.



## Case Study

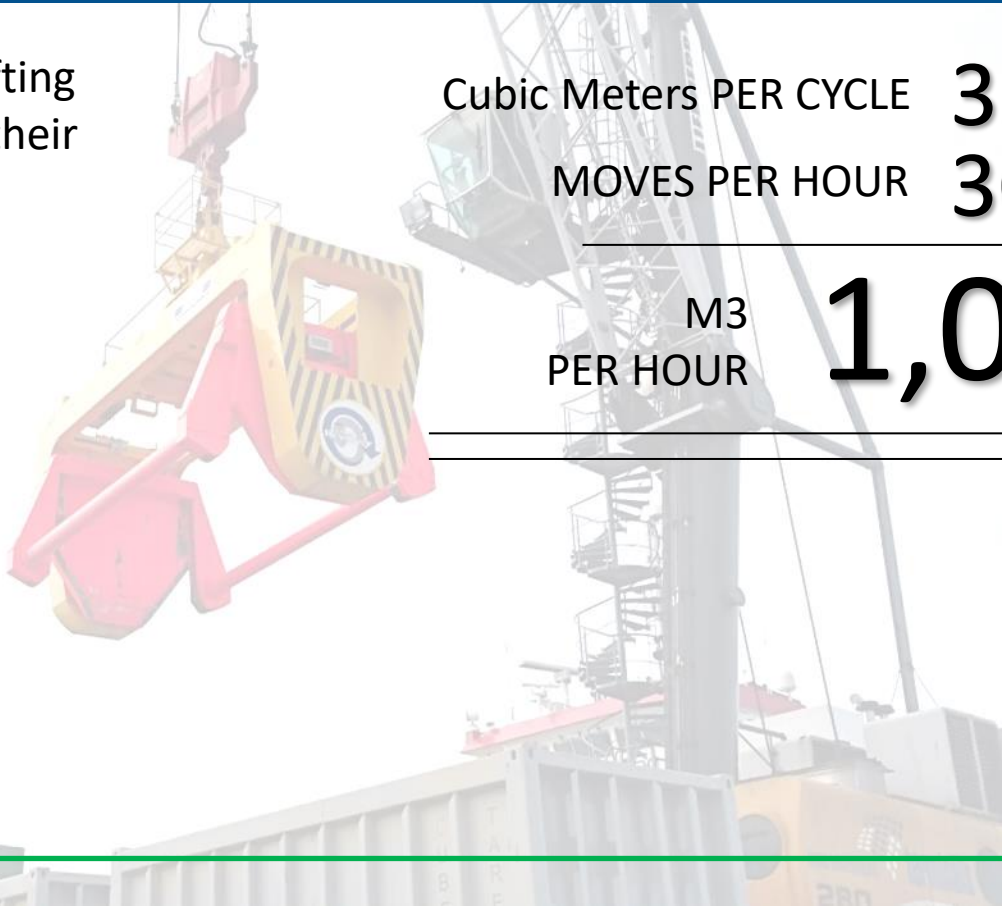
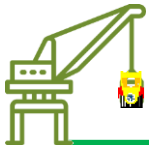
With the system capable of lifting 35m<sup>3</sup> per cycle, RUT utilized their existing MHC

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

allowing them to handle large volumes of biomass per hour

Cubic Meters PER CYCLE **35.00**  
 MOVES PER HOUR **30.00**

M3 PER HOUR **1,050**



## Case Study



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

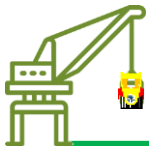
*Now we can perform dry bulk handling operations involving a significantly smaller number of machines and human resources.*

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



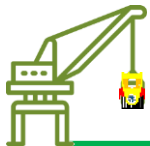
**Atis Šulte**

Sales & Business  
Development Director



## Case Study

**LOCATION:** Poti - Georgia  
**COMMODITY:** Copper Concentrate  
**CRANE:** MHC



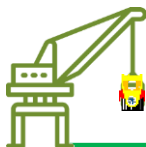
## Case Study

### 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 Laurson, 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 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 workers' 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 experienced 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**

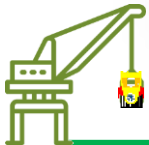
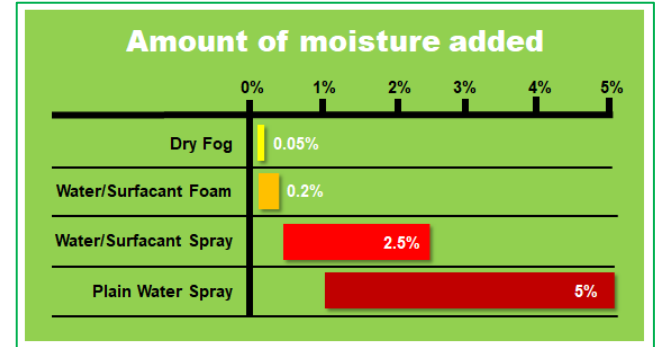
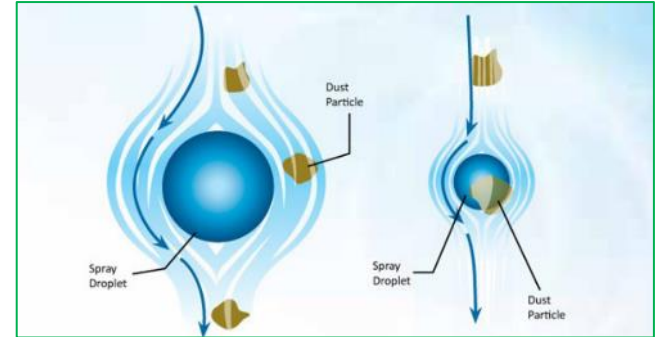
Handling dry bulk from the port using CBH, is *environmental best practice*.

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 unloaded, 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

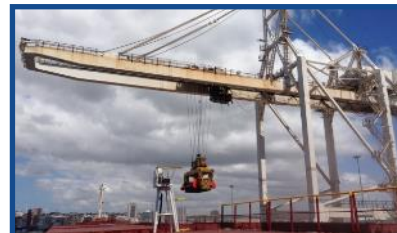


Arizona/Mexico - Copper

## Case Study – Further Examples



Argentina – Soya/Rice



South Africa- Manganese



Australia - Copper



Chile - Zinc



Argentina - Grain



Australia – Iron Ore



USA – Wood Chip/Pellet

SHIP AND  
STS CRANE



## The many benefits of Containerised Bulk Handling

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**C**ontainerizes the bulk

---

**L**ow set up cost

---

**E**nvironmentally friendly

---

**A**ward winning solution

---

**N**o contamination

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## The many benefits of Containerised Bulk Handling

- ✓ **FLEXIBLE BERTH – No fixed bulk berths**
- ✓ **FAST TO START**
- ✓ **NO DUST**
- ✓ **LOW COST**

## 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

