



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?



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?

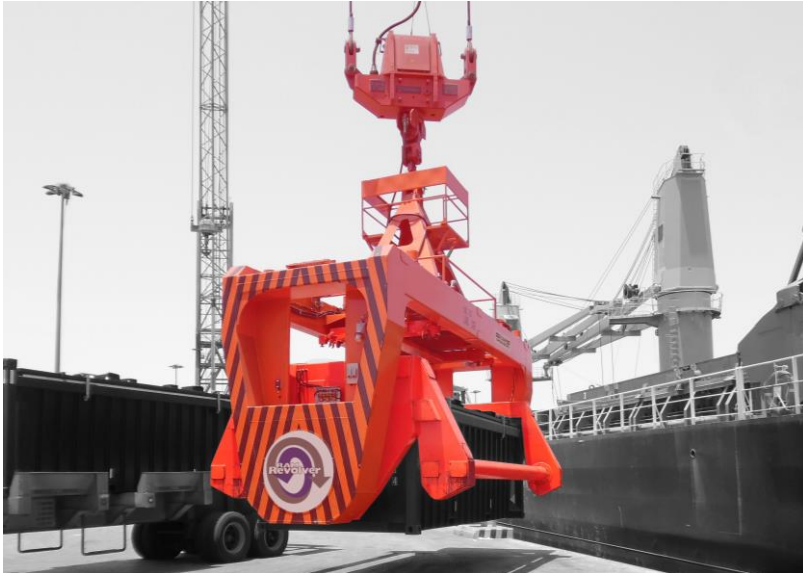
Selling over 80 units of 'Revolver' for various types of crane application from MHC, STS, Ship, Reach Stacker & Bridge Crane



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	2015
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	4121	2	2019
Chile	South America	4131	1	2019
Indonesia	Asia	4111	2	2021
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

...and 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:



**Silo-Filler's
disease**



**Black Lung
disease**



**Farmer's Lung
disease**



**Manganese Dust
Neurotoxin**

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?

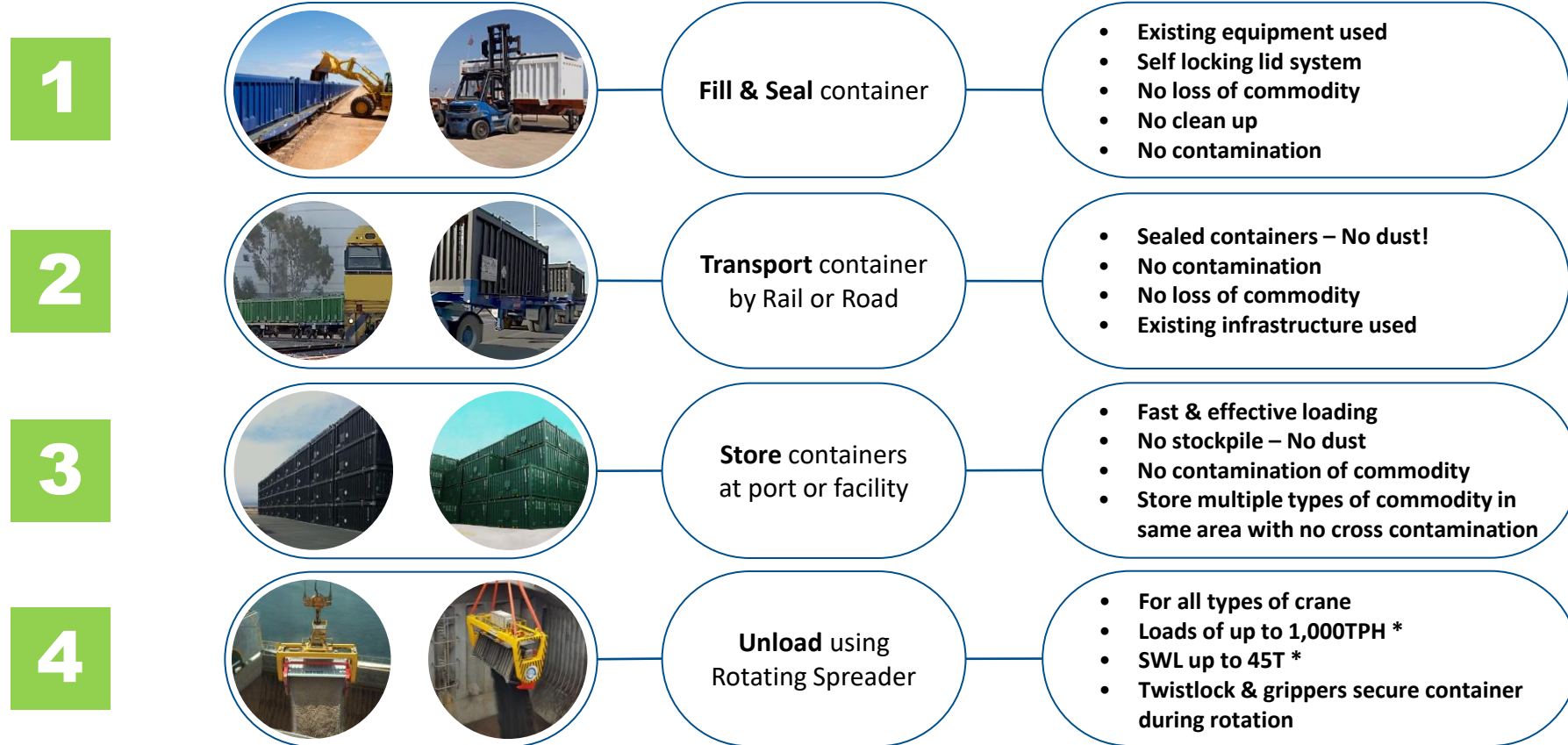
Using a 4 stage process, bulk is handled with minimal transfer points...

..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

HOW FLEXIBLE IS IT?

A large orange RAM containerised bulk handling spreader is shown in operation at a port. The spreader is mounted on a trailer and has a large circular logo on its side that says "recovery". It is positioned next to a dark-colored ship. In the background, there are other port structures, including a tall crane and a lighthouse. The scene is brightly lit, suggesting a sunny day.

Containerised Bulk Handling

EXPORT

Pit to Ship



Fill at mine

Transport



Stack containers at port



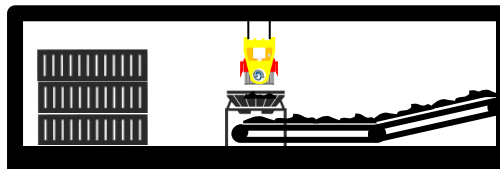
Lift & unload directly into ships hold

Pit to Ship Loader



Fill at mine

Transport



Store containers in port's shed



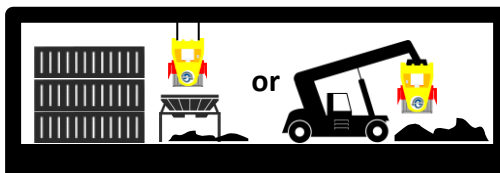
Lift & unload onto conveyor ship loader

Pit to Shed



Fill at mine

Transport



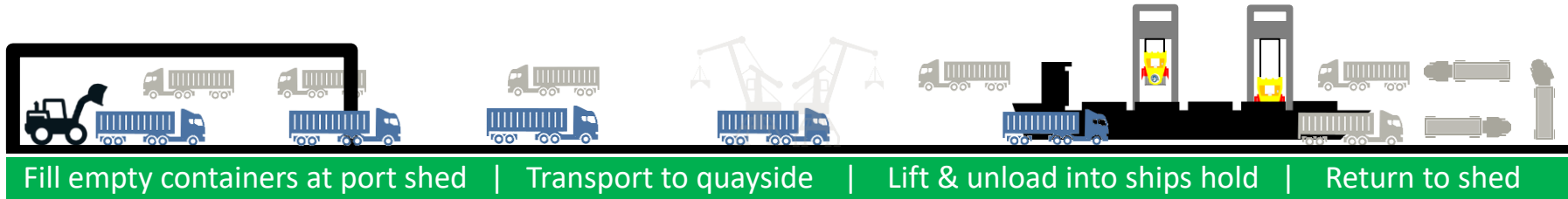
Lift & unload into shed at port of facility



Containerised Bulk Handling

EXPORT

Shed to Ship (Internal Truck Loop Operations)



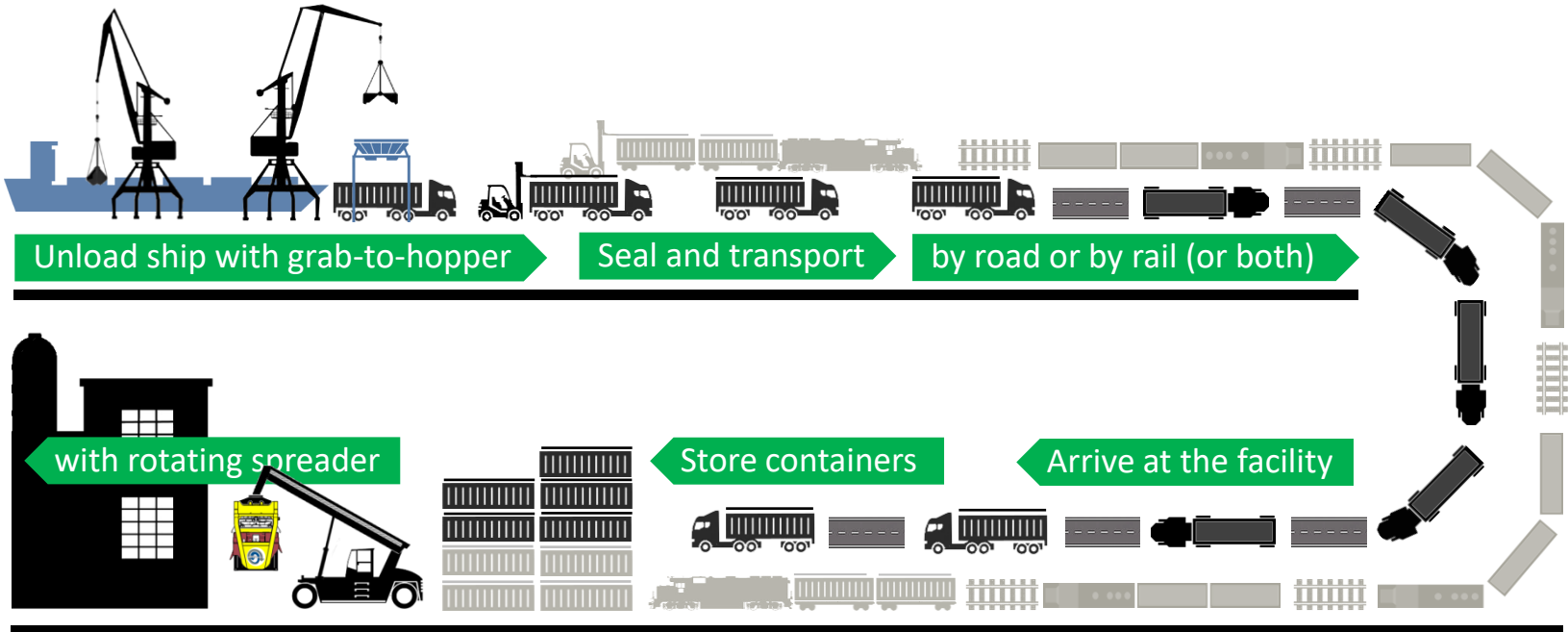
Shed to Ship (External Truck Loop Operations)



Containerised Bulk Handling

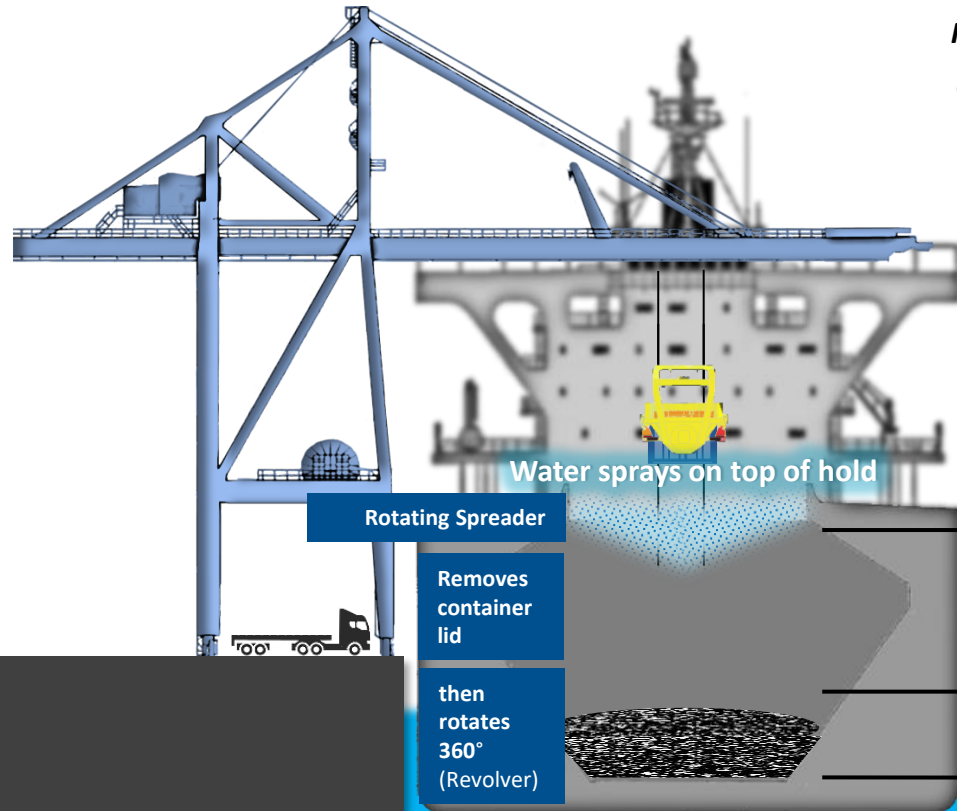
IMPORT

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 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 reducing dust generation

17m Total area depth

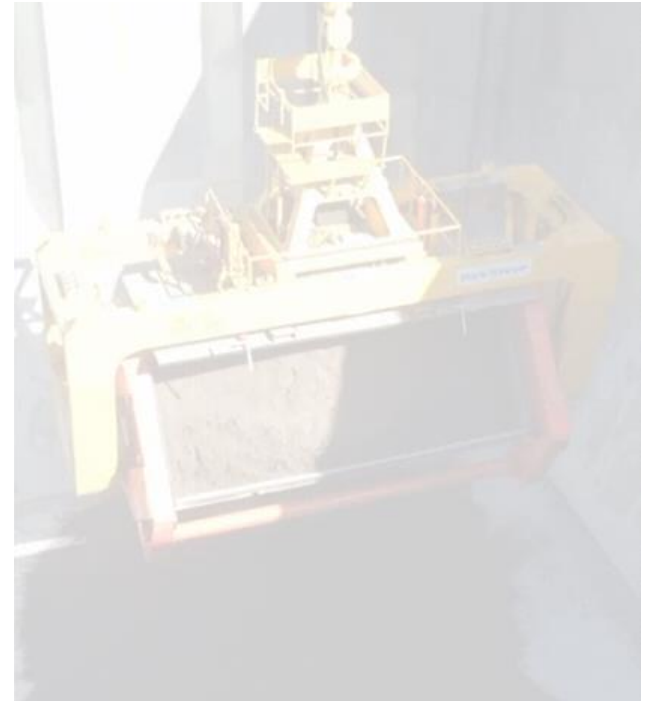
12m Air height in hold

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

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 (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.



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.



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

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.



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.

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

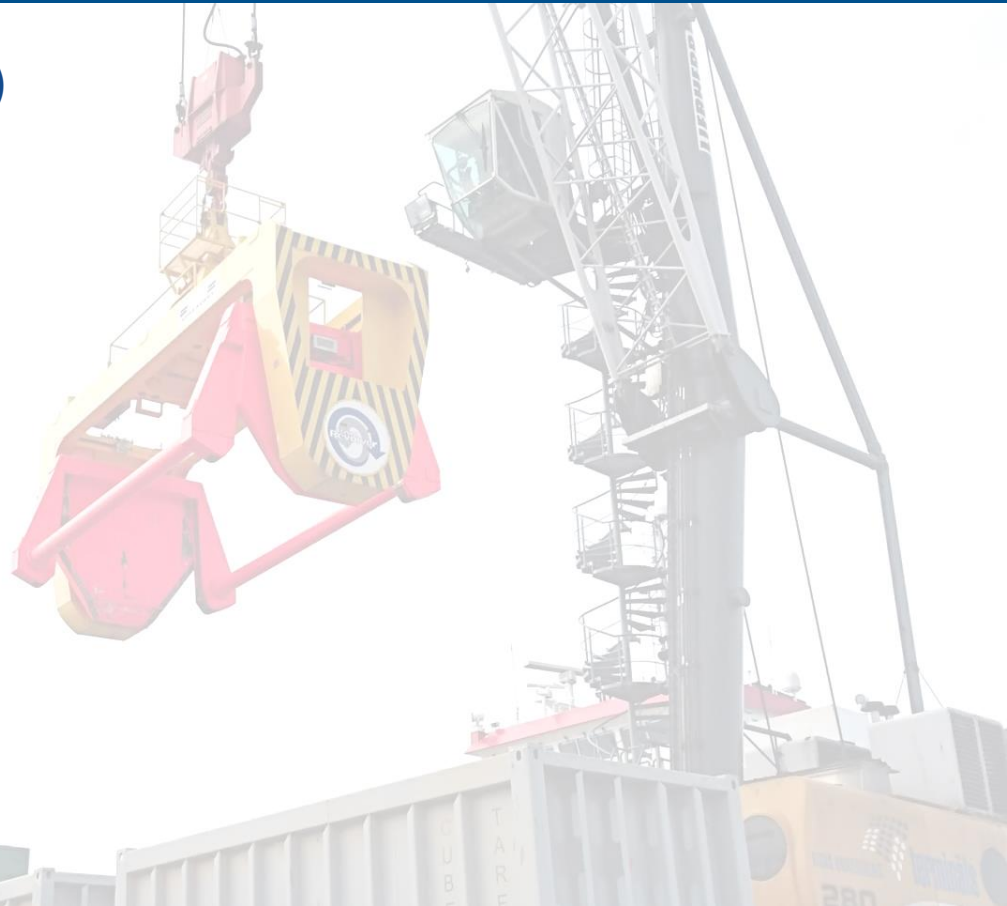
A large yellow and red RAM spreader is being lifted by a crane at a port. The spreader is suspended in the air, and the crane's structure is visible on the right side of the image. The background shows a port area with shipping containers and a building.

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

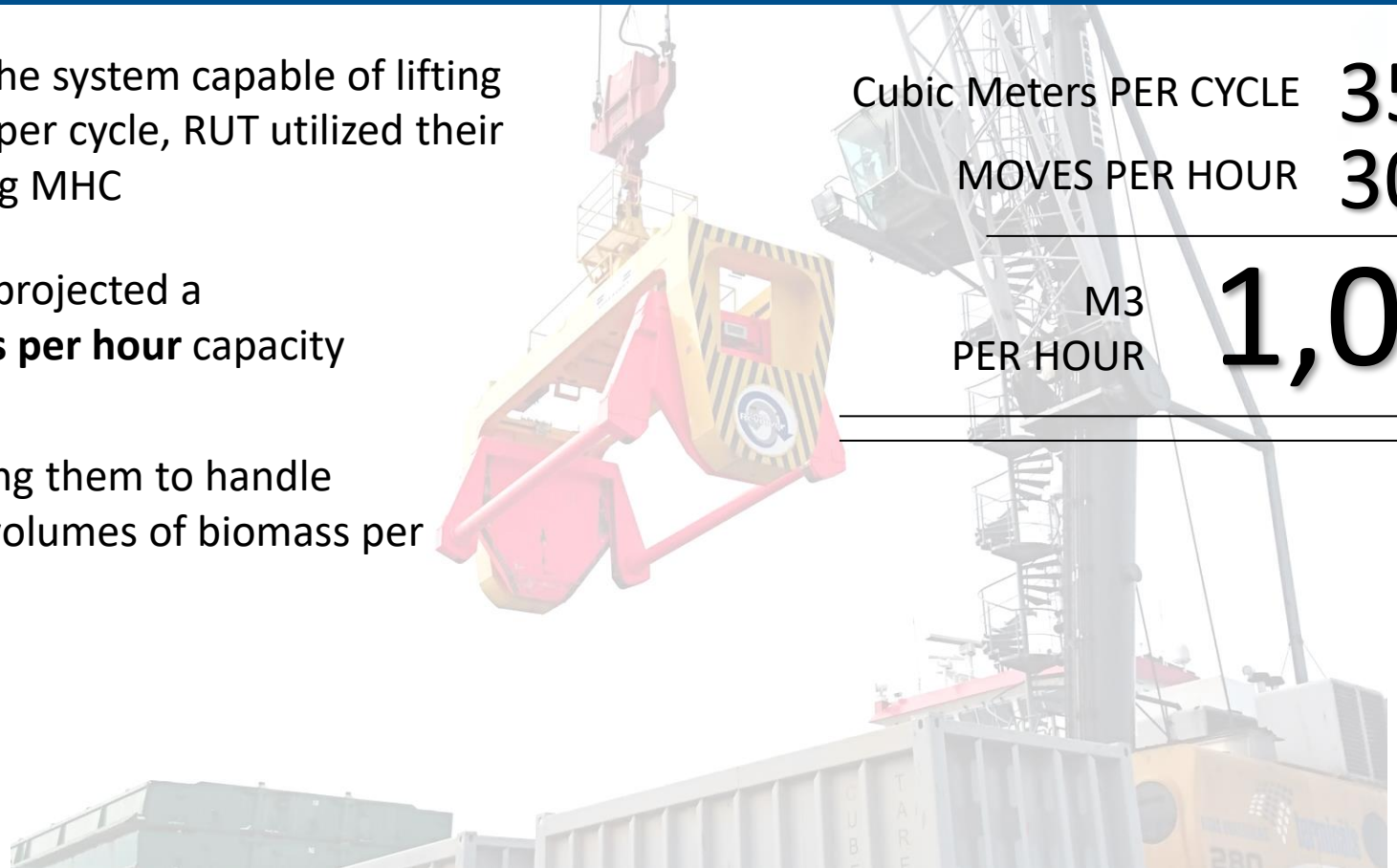
With the system capable of lifting 35m³ per cycle, RUT utilized their existing MHC

...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**

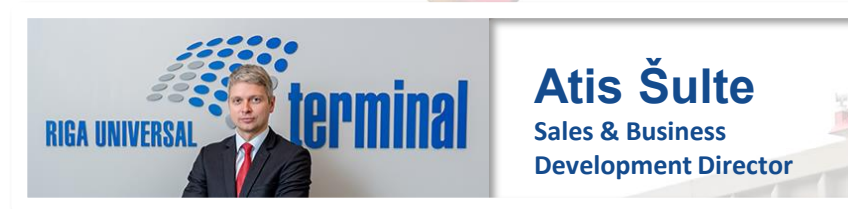


Case Study

“

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.



Atis Šulte

Sales & Business
Development Director

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

”

Case Study




LOCATION: Poti - Georgia

COMMODITY: Copper Concentrate

CRANE: MHC

Case Study


CBH introduced to support local dry bulk clients...

A large blue RAM spreader truck is shown at a port. A yellow and red spreader bucket is suspended above the truck. The truck has the text "3200U" and "2805" on its side. The background shows a port with several yellow cranes.

...with local companies importing, blending and exporting locally mined copper concentrate gives the port flexibility to handle all commodities with existing equipment using CBH.

Case Study

With the port located close to a residential area, school and recreational park...

An aerial view of a port terminal. A large blue and white cargo ship is docked at a pier. A large yellow and blue spreader is positioned on the pier, with its arm extended towards the ship's hatch. The background shows a body of water and a distant shoreline.

...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

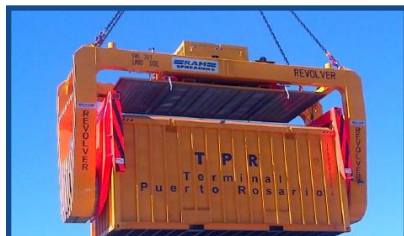


Chile - Copper

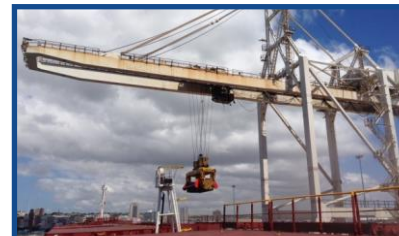


Arizona/Mexico - Copper

Case Study – Further Examples



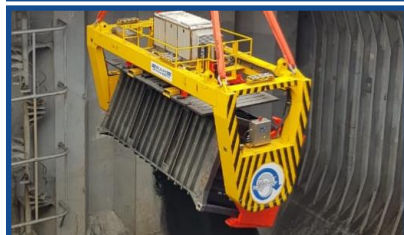
Argentina – Soya/Rice



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

Containerizes the bulk
Low set up cost
Environmentally friendly
Award winning solution
No contamination



COST



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

