RAM SPREADERS

PARTICULATE EMISSION CONTROL

The dangers & losses of dust particulates during loading, transport and unloading of bulk commodities.

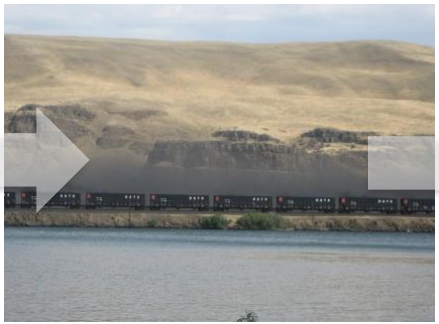
Frank van Laarhoven

Traditional Bulk Handling – Material Loss

MATERIAL LOSS IN THE SUPPLY CHAIN

Traditional bulk handling systems run a high risk of material loss during the handling process, from multiple transfer points, open wagons during transportation, open stockpiles and traditional ship loading.

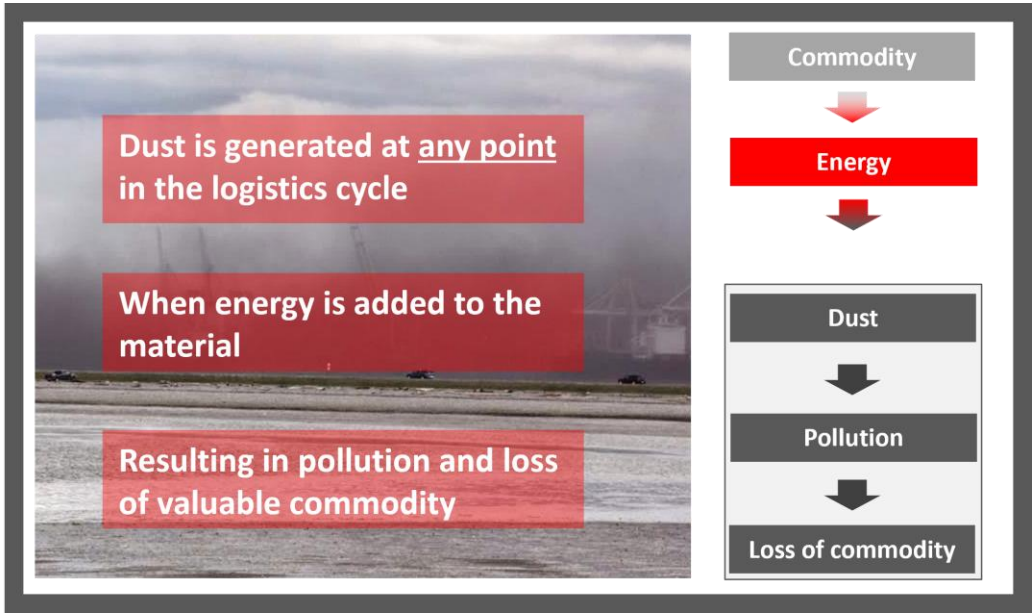
This is not only damaging to the environment, but also money blowing in the wind.

TRANSFER POINTS	OPEN WAGONS	STOCKPILES	SHIP LOADING
			

Traditional Bulk Handling - Pollutants

HARMFUL AIR POLLUTANTS

During the handling process, dust is generated when energy is added to the material, resulting in harmful air pollution!



Traditional Bulk Handling – Health Risks

THE DANGERS OF REGULAR EXPOSURE

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

Traditional Bulk Handling – Health Risks

LET THE DUST SETTLE!

Fine particulate matter, sometimes remains suspended, allowing the material to travel over long distances.

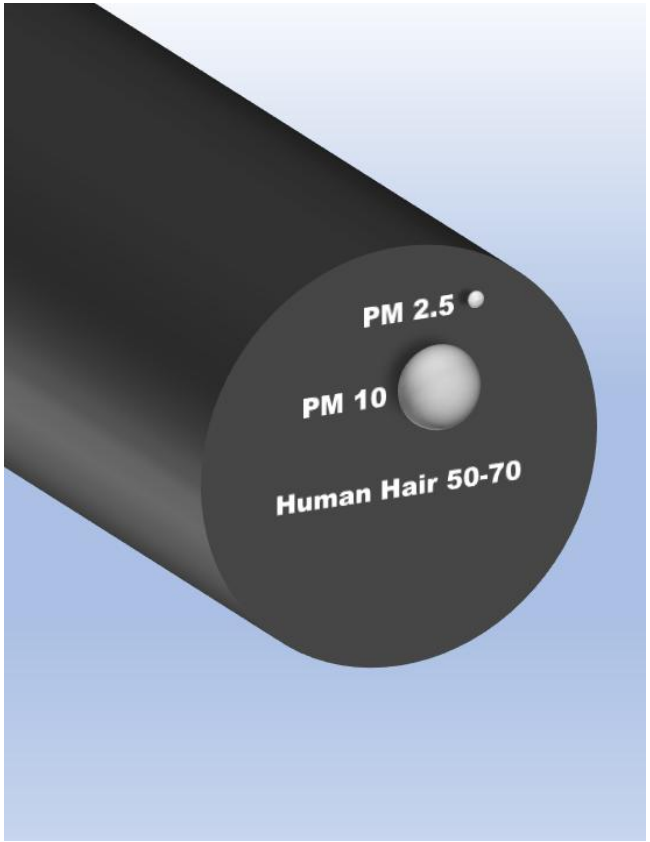
Particles fall into 2 categories:

PM2.5µm (microns)
Very fine particulates that remains in atmosphere for many weeks.

Penetrates: From lungs into bloodstream.

PM10µm (microns)
Larger particulates that return to surface through rainfall and gravity.

Penetrates: Deep into lungs.



Is there any solution?

CONTAINERISED BULK HANDLING

The new norm in bulk handling

Traditional Bulk Handling – Health Risks

TRADITIONAL -VS- CONVENTIONAL

Fine particulate matter, sometimes referred to as floating dust, remains suspended, allowing the material to travel over long distances.

Traditional Bulk Transport

- HARMFUL PARTICULATES RELEASED
- SIGNIFICANT COMMODITY LOSSES
- "MONEY BLOWING IN THE WIND"

CBH Bulk Transport

- NO RELEASE OF HARMFUL PARTICULATES!
- NO COMMODITY LOSSES!
- ENVIRONMENTAL BEST PRACTICE!

CBH – Components

THE CONTAINER

The CBH containers have removable lids with special latches that seal the container when the lid lands into the container.

CBH – Components

THE ROTATING SPREADER

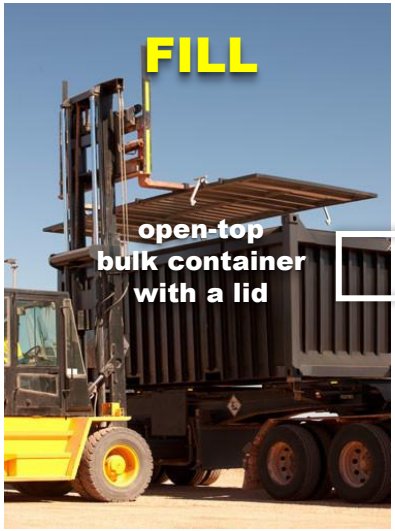
- Locks onto container using standard twistlocks.
- Lifts lid from container.
- Rotates container along its longitudinal axis.
- Replaces the lid.

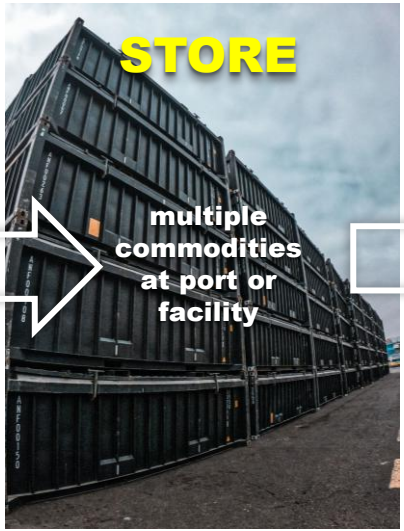
CBH – Handling Process

FROM START TO FINISH - CBH

CBH follows a simple "**Fill & Seal** – **Transport** – **Store** – **Unload**" process for handling bulk.

Commodities can be transported by road, rail, or both (bi-modal), making it possible for remote mines or handling facilities to export by using existing road and rail networks.





CBH – Protecting Commodity & Environment

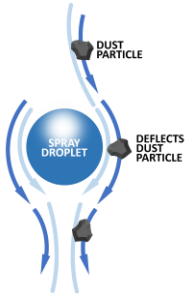
INTO THE MIST!

A misting system such as the one provided by RAM helps prevent dust plumes during the unloading process.

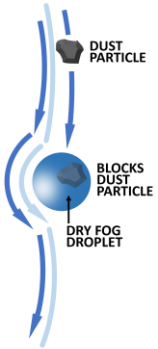
This system typically consists of a series of **spray bars** mounted to the vessel hatch, equipped with **fine mist** nozzles that produce microscopic droplets (dry fog).

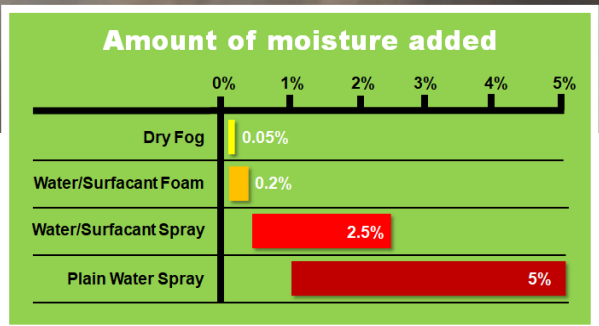
These droplets collide with airborne dust particles, causing them to agglomerate and settle back into the ship's hold.

Plain Water Spray



Dry Fog Spray





CBH – Case Study 1

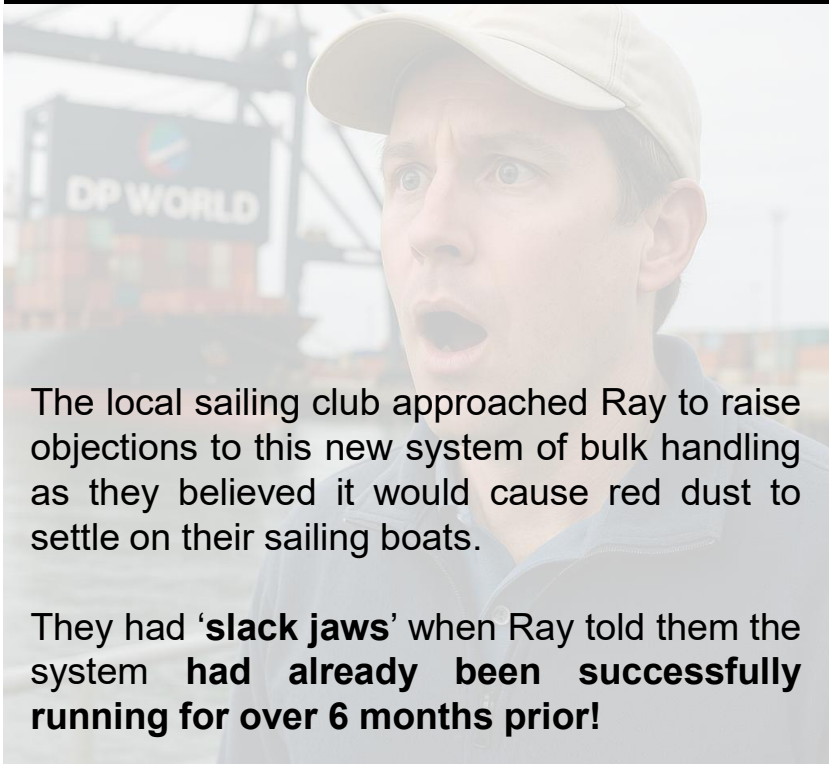
DPW Adelaide

WHERE IT ALL BEGAN FOR RAM!

In 2008, Ray Lee from DP World Adelaide approached RAM to develop the first container tippler in Australia, enabling the container terminal to handle bulk cargo.

Ray Lee

The Day the Sailing Club Went Silent!



The local sailing club approached Ray to raise objections to this new system of bulk handling as they believed it would cause red dust to settle on their sailing boats.

They had '**slack jaws**' when Ray told them the system **had already been successfully running for over 6 months prior!**

CBH – Case Study 2

Mauritania

Government measures in 2015 to attract more mining companies to Mauritania's mining sector.

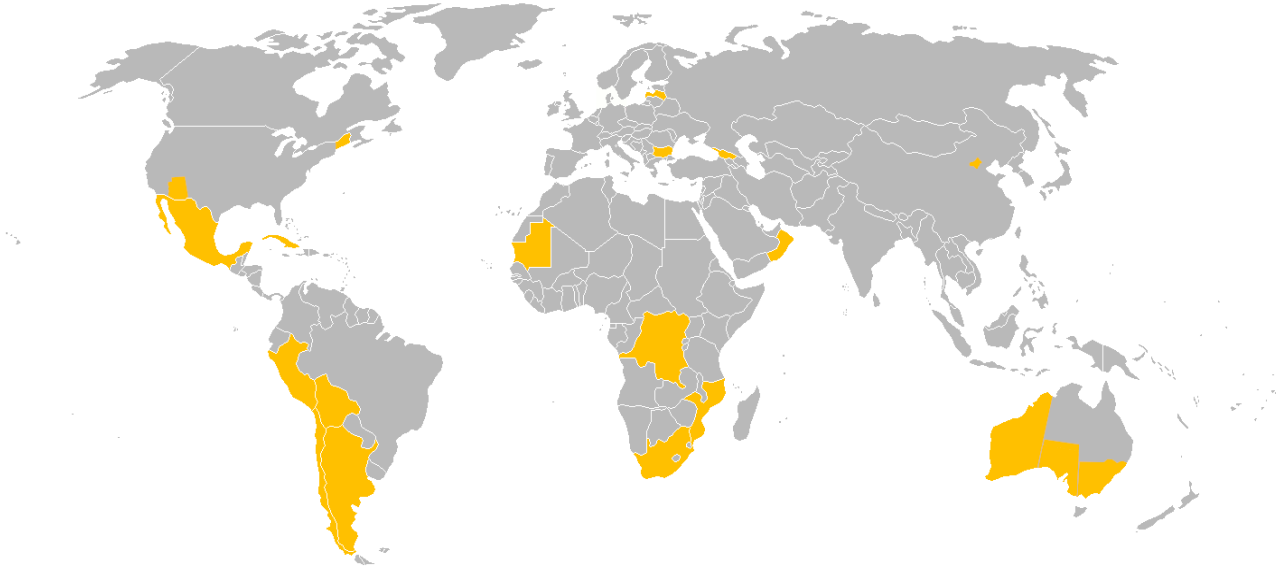
Mauritania introduced the CBH solution to export commodities, such as iron ore, and reduce material loss, dust, and contamination during transit and handling.

Ports like Nouakchott and Nouadhibou introduced this method of bulk export.

CBH – Users

Location and Units:
Africa = 9 Units
South Africa = 9 Units
Asia = 15 Units
Australasia = 10 Units
Central America = 2 Units
North America = 5
South America = 40 Units
Europe = 7 Units
Middle East = 3 Units
UAE = 5

Commodities Handled:
Iron Ore | Copper Concentrate | Urea | Coal | Bauxite | Lithium | Grains | Biomass



CBH ECO FRIENDLY Solution

Regulations

ENVIRONMENTAL COMPLIANCE

International Maritime Organization (IMO) Regulations

Governs the safe carriage of solid bulk cargoes. Focusing on the prevention of hazards due to shifting cargoes, chemical reactions, moisture content.

Environmental Protection Agency (EPA) Guidelines

Clean Air Act (CAA) and Clean Water Act (CWA) regulates emissions and discharges from bulk handling operations to prevent air and water pollution.

Local Authority and Port Regulations

Often have their own specific regulations for bulk handling operations, including requirements for loading/unloading, material storage, emergency response, and environmental protection.