

Argentinean revolution in grain loading



Argentinean Terminal Puerto Rosario (TPR) has revolutionized the world of grain loading and storage after becoming the first terminal in the world to utilize containerized bulk handling (CBH) to export grain.

TPR, located along the banks of the Parana River and 300km away from Buenos Aires, is a strategic multi-purpose terminal serving the region's growing commerce. The terminal is a key gateway hub, handling all types of import and export cargo.

TPR loads, transports and stores its grain product in specially designed food grade containers. Once delivered to the marine terminal, the commodities in the containers are stored at the port awaiting vessel shipment; replacing the need for expensive silos. Once the vessel arrives, the containers of grain are handled like normal containers until they are tipped into the hatch of a ship using a revolver.

THE OLD WAY

One of the most important exports of Argentina is grain. Prior to the use of CBH, TPR's system included the use of dump trucks and shiploaders in operations similar to many other terminals.

The problem with these conventional systems is that they resulted in material losses, clean-up costs, and in some cases, contamination of the grain by unwanted rodents. All this was in addition to expensive silos and sheds used to store materials.

The innovative management at TPR quickly determined that they needed to find a method to improve productivity and accommodate the growing business of exporting grain. In addition, they wanted to simplify the operation with minimal investment by using much of TPR's current equipment and infrastructure. Large capital expenditure and set-up time for new warehousing and equipment was not a viable option. While researching a number of best possible solutions, TPR discovered the CBH system.

CBH is a complete system that includes the containerization of bulk products such as grain, at the inland depots or farms, before moving it directly to the port's yard. The loading process is completed by using a specialized rotating spreader, the revolver, manufactured by RAM Spreaders, and the purpose-built containers have been manufactured specifically for handling food grade products.

THE REVOLUTION

At TPR, the CBH system involves loading agri-bulk at a storage location or from a barge into specialized TEU containers with a payload capacity of around 30 tonnes. The sealed containers are then transported to the terminal yard and stored ready for loading. Once a vessel is alongside, the containers are handled as they would be in conventional container operations and are delivered to the quay side by truck.



Loading is performed by on-board ship cranes or by mobile harbour cranes fitted with a revolver. A lid is lifted off automatically and material is poured into the hatch during a 360° rotation.

ENVIRONMENTALLY FRIENDLY

As the grain is sealed in the container at the farm and only opened at the bottom of a vessel's hatch, there is no material loss or contamination. The revolver process differs from normal bulk loading in that it is very gentle and adds very little energy to the material. The revolver lowers the container almost to the bottom of the hatch and tips it gently. The result is a reduction



in dust, and with less dust in the air, workers can then breathe a lot easier.

To comply with environmental protection policies, high costs are encountered and the loading process becomes slow. With the CBH process, loading rates can be as high as 25 cycles per hour with 27 tonnes of grain in a box. With two cranes, over 1,000 tonnes can be loaded per hour. The RAM development team is now working on a system to load at twice this rate.

"With two cranes they load at 1,000tph [tonnes per hour]."

THE CONTAINER AS SILO

The most innovative aspect of this new operation is the use of the container as a silo as well as a method of transport. Traditionally grain exporters needed expensive silos, costing over US\$20 million, which prevented a number of ports from exporting grain.

With containers acting as both storage and transport, product is sealed directly after filling. The only way to access the grain or commodity is via a special food grade sampling port fitted within a container. To overcome the high capital set up costs the managers at TPR leased the containers, reducing the capital that would be otherwise tied up in a silo that would remain empty for long periods throughout the year.

GROWING BUSINESS FLEXIBLY

By using the CBH system the terminal has been able to grow its business to handle more grain and meet the needs of the growing South American agri-bulk sector, without the need for



expensive capital investment in silos and bulk loaders. The result is a more profitable port.

Juan Carlos Cruzat, Head of Container Terminal at TPR stated "We are very pleased with the containerized grain system as it allows a much cleaner operation. The flexibility of the system with no silos or conveyors on berth is a big plus for the port."

To acquire and set up a traditional bulk grain operation can take years. In contrast, a CBH operation can take no more than six months, allowing for a much faster and efficient way to get bulk commodities into the market. Putting in conveyors and bulk storage makes the system dedicated, however, this is not the case at TPR, as they can load conventional containers on Monday, grain on Tuesday with the revolver, and back to containers on Wednesday with no clean-up required.

An additional benefit of the CBH system is mobility. The CBH system, which includes the RAM revolver and containers, can be



moved to another terminal if required. The investment is transferrable.



GLOBAL POTENTIAL

With demand for food products growing globally, the system provides opportunities in other locations to use existing port infrastructure. The project has been used as a case study by several port and logistics consultants.

Ray Lee principle of Portside Solutions in Dubai has reviewed the system and commented. "I see particular application in developing countries without traditional bulk loading infrastructure. This solution will allow grain traders to get their product to market simply with existing port facilities," Lee went on to comment. "The scope for implementation in South America, Eastern Europe and other parts of the world is huge; Portside Solutions is currently working on a feasibility study for a major terminal operator considering adopting the system at their terminals on three continents."

A close study has been made of the system by South Australia-based Gray Bulk Concepts. Principle Daryl Gray notes "a containerized bulk system for grain presents major opportunities for grain traders to bypass congested monopoly owned bulk loading infrastructure." Gray also commented "containerizing the grain in small 25-tonne parcels reduces the risk of contamination and product rejection delaying vessel loading. A single transport and storage vessel from the farm into the hatch of the ship reduces handling which reduces cost and potential of contamination ... it has a lot of potential"

A NEW ROUTE TO MARKET

The use of container terminals gives grain exporters and traders another route to market. Often during peak harvest time, the bulk loaders get congested and their customers cannot export the product when and how they want. By using the flexible CBH system it is now possible to get the grain to market. What started as a small change in Argentina is set to grow into a revolution in grain loading globally, with a new flexible low capital solution to export agri-bulk.

The CBH system is already in full operation in Chile, Australia and Africa in the mining industry for products such as copper, coal and iron concentrates where throughputs well over 1,000tph per crane are achieved. The RAM revolver can be



designed to operate with any type of port equipment such as reach stackers, ship to shore cranes, mobile cranes and ship's gear cranes.

ABOUT THE ORGANIZATION

RAM Spreaders has been manufacturing spreaders since 1972. Now as part of the PEINER SMAG Group, the company is a major lifting accessories supplier and boasts a strong reputation within both bulk and container handling industries.

RAM Spreaders' corporate headquarters, with design and development facilities, are in Singapore, with a manufacturing plant in China and servicing facilities in Lancashire, England and Salzgitter, Germany.

Recent developments include the new SingFlex TwinForty Headblock for single hoist ship-to-shore cranes. All-electric separating twinlift telescopic spreader and a telescopic spreader designed for mobile harbour cranes. These new innovative products join the existing RAM range of telescopic, fixed and separating twinlift spreaders, offering the finest choice for ship-to-shore cranes, RTGs/RMGs, mobile harbour cranes and mobile equipment.

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