Containerised bulk logistics

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South Australia invests in new infrastructure and Flinders Logistics systems expand, as mineral logistics are recognised to be the key factors for mineral sand operations.

By Bruce McMichael

New technology and infrastructure is transforming the fortunes of mineral logistics in the state of South Australia.

Cristal Mining’s mineral sands operations are dotted around central and southern Australia and its decision to use Flinders Logistics Port Adelaide (PLAP) facilities for a long-term transport, storage and loading services for its titanium dioxide (TiO₂) feedstock is in part due to the company’s investment in quayside infrastructure and using innovative loading and dust suppression technology.

PLAP is part of the Flinders Port Holdings (FPH) group based in the port city and capital of South Australia, Adelaide. FPH is the holding company and operational hub for a network of ports offering port management and stevedoring services, logistics, container terminals, property interests as well as being a major manager of port services across the region, having won the privatisation contract for South Australia’s ports in 2001.

The group operates seven ports across the state including Port Adelaide, Port Lincoln, Port Pirie, Thevenard, Port Giles, Wallaroo and Klein Point. Its Flinders Adelaide Container Terminal division operates container terminal facilities at Port Adelaide.

A key part of FPH’s operation is to develop supply chains to move mineral exports from mine to market for South Australia’s largest exporter; the mineral resources sector.

A dedicated bulk minerals export precinct has been created at Berth 29 at Port Adelaide and the company has recently developed 25,000 square metres of hard stand to accommodate the storage and handling of mineral sands.
Beyond Port Adelaide, Flinders Ports is scoping out port infrastructure export options for bulk commodities that are capable of meeting both the short and long-term requirements of South Australia’s mining sector.

Also, the resumption of heavy mineral sands mining at Mindari, following an injection of cash by Murray Zircon, sees export through Port Adelaide to China, home to Murray Zircon’s parent company Orient Zirconic.

The industrial and metallic mineral sector in South Australia has steadily expanded over the past decade, and its seaborne logistics facilities are reaping the benefits of investment and infrastructural development.

The state currently lacks a deep-water port, incentivising Flinders Logistics to upgrade a bulk mineral containerising system for, “South Australian miners to get their product to market cost effectively, using the state’s existing port infrastructure,” a senior port executive told IM.

This trend of using containerisation for bulk minerals via existing port infrastructure will continue in the short term, particularly for high grades of iron-ore, until a deep-water port facility is developed elsewhere in the state.

Flinders Logistics uses a multi-award winning system known as rotating container technology for unloading containerised bulk, “which offers mining companies the highest standards of safety and environmental management. This (also) supports our mining customers’ goals on corporate social responsibility,” said the spokesperson.

Rotating container unloading technology is a system which allows containerised minerals to be unloaded into bulk ships using existing portainer cranes, as currently used at Flinders Port’s Fremantle Container Terminal.

Quayside cranes, known as portainers, are fitted with rotating devices and are able to lift and lower the purpose built containers deep into the cargo hold of a ship and then rotate the container until all the material inside the container has been emptied into the hold.

Purpose built containers are lifted into a ship’s hold and rotated to unload product using a container rotating device, as described by Australian maritime services company Tradewinds Customs and Freight.

The empty container is then returned to the upright position and returned to the wharf where it can be loaded onto a rail car and sent for reloading.

There are currently two devices on the Australian market, trade marked as ‘Rotainer’ and ‘Revolver’. The containers are purpose built bulk product containers fitted with lids that are capable of being rotated for unloading.

The containers are standard container size in length but half the normal height, being 6,060mm long and 1,800mm high with a capacity of 20.8 cubic metres. The containers are designed for a maximum gross weight of 38 tonnes and a net load of 35 tonnes.
Tailored solutions are based on individual product characteristics and developed in conjunction with leading container suppliers. Storage containers are developed according to the product characteristics with particular consideration given to product hang up, corrosiveness and environmental sensitivities [Australian Dangerous Goods’ code compliance],” said the spokesperson.

The rotating device is attached to a portainer with standard equipment. With the ore being loaded deep into the cargo hold, dust is kept to a minimum, and with a fine water spray sourced from the top of the hold, dust generation is further reduced.

The Flinders Logistics’ proprietary D F-Misting system releases a fine mist through its multiple layered, variable droplet application across the ship’s hold. This prevents dust from escaping out of the vessel’s hatch and into the environment.

Cristal Mining’s supply chain will use Flinders Logistics’ proprietary D F-Misting System. “The system, which has a patent pending, provides a consistently effective method for minimising dust emissions when bulk cargo is being loaded onto a ship. A fine mist matching the size of the mineral dust particles is generated by nozzles around the loading hatch and this creates a natural barrier across the ship’s hold - preventing dust from escaping,” said a company spokesperson.

“The system uses less water and surrounds the hatch in a quicker time than those previously experienced on the market,” the company explained.

As a necessity, Flinders Logistics has adapted and developed a system that can be used while loading ships, managing dust generation for environmentally sensitive products. “Our experience and management protocols allow us to quickly adapt to different types of dust being generated under differing weather conditions,” said a spokesperson.

Product moisture is tracked through a yard management system and the water suppression system is metered to ensure that product moisture limits are acceptable to the ships’ Master and international standards for shipping.

“The success of our technique and systems capability has been proven with air monitoring equipment used during ship loading,” said the spokesperson.

“Another plus is Flinders Logistics’ tippler guidance system. This is a fully automated process, which is used on the wharf to direct the tippler onto the full container”. Crucially, it has removed the injury risk to personnel from guide ropes attached to the tipping spreader, and improved productivity and reduced damage to containers.

“Safety for people on site and for the wider environment is the ethos at Flinders Logistics. We are pleased to provide Cristal Mining and our other mining customers with a logistics service that enables safety, environmental and economic goals to align,” Mr Pellizzari said.

Working with software consultants, Flinders Logistics developed a bulk container tracking system that allows accountability of all stock. This system has been used to allow blending at the port during ship loading by tracking individual grades of products through a container bulk storage system.
“In the medium to long term, containerising bulk will continue be a preferred option for high-value or environmentally sensitive bulk minerals because it is an efficient, clean and safe way of moving these commodities,” said FPH marketing manager Alison Snel.

Ms Snel further stated that the group is currently investing in new infrastructure across the group’s three subsidiaries Flinders Logistics, Flinders Adelaide Container Terminal, and Flinders Ports.

The fuel import facility will accommodate both Medium Range and Long Range class vessels, and 25,000 square-metres of additional hard stand for container storage has been developed at Berth 29.

Additionally a draft Environmental Impact Statement (EIS) for Port Bonython Bulk Commodities Export Facility has been completed for a proposed deep-water port facility for South Australian iron ore exports. Government approvals are expected by mid-2014.

Stage one was completed earlier this year and serviced its first vessel, the 45,950 dwt oil products tanker Jupiter Express, on 13 February 2014. The final phase of the project, stage two, is scheduled for completion this month (April, 2014).

The long-term logistics services deal struck between Flinders Port Holdings and Cristal Mining Australia will see Cristal using purpose built containers, the Flinders Logistics’ containerised system, for the transportation, storage and loading of the titanium dioxide feedstocks at Port Adelaide.

Speaking at the time of the deal, Andrew Pellizzari, general manager of Flinders Logistics said: “We are delighted that Cristal Mining has chosen Flinders Logistics to manage this key supply chain and we look forward to working with them on a long term partnership basis.”

Flinders Port is: “investing in new equipment and technology to build on the group’s success, which has resulted in increasing cargo volumes,” said a company official, adding that: “The new equipment and technology allows us to better meet the needs of our existing customers. Efficiency improvements from these upgrades will enable the group to attract new business that would otherwise be diverted via road and rail to competing ports on the east coast.”