

Supporting the sustainability of the fertilizer industry



Mobile ship offloading and warehouse distribution system for Grindrod Terminal's existing fertilizer storage facility at Maydon Wharf 13 in Durban, South Africa.

“The handling, storage and distribution of fertilizer are critical phases between its production and consumption, representing not only major cost commitments but also the potential for fertilizer loss and contamination during handling, transport and storage. This not only impacts the productivity and costs of the operation, but is also a cause of environmental pollution, and significant corrosion and damage to the plant,” says Paul van de Vyver, DemcoTECH General Manager.

“As a result, dry bulk storage and handling equipment should be used whenever possible,” says van de Vyver, “as these systems can be designed to minimize these problems and contain losses and dust pollution.”

“As opposed to liquid bulk, containers and other general cargo, dry bulk cargo is mostly transported in loose form, determining to a large extent the storage and transport technology employed at the quayside, in the terminal and at other locations before onward transportation.

“However, as with any bulk handling and storage operation, particularly one handling material as abrasive and varying in material type as fertilizer, while selection of the

appropriate equipment is critical, as important are proper maintenance and plant assessment of operational facilities.”

Providing a full range of services to support bulk materials handling technology and equipment over the full product lifecycle, DemcoTECH was recently contracted to assess and then rectify the fertilizer storage and distribution facility for Steinweg at the Bridgeport facility in Durban, KwaZulu-Natal, South Africa. The facility had been operating below requirements, as well as having been damaged in the floods in the surrounding area.

The facility is part of the global C. Steinweg Bridge group, which provides services in storage, handling, forwarding, chartering and other commodity related logistics services.

The contract commenced with a full plant assessment and audit and was then extended to repair, refurbish and upgrade the plant. It included supervising and implementing all the supply contracts to ensure the recommendations made in the report were implemented.

The fertilizer facility comprises a truck offloading system, a warehouse and all the

in-plant conveyors stockpiling and storing the fertilizer in a covered stockpile. The system is automated using an elevated tripper for the truck offloading through to the stockpiling operation. The upgraded design included new ceramic-lined pulleys and chutes, a redesign of the discharge gates from the truck offloading system hoppers, retrofitting and refurbishing mechanical components, such as the scrapers, spillage reductions and refurbishment of the crushers.

“While part of the damage had been due to flooding, another issue identified was the extremely corrosive nature of the fertilizer and the resultant degradation of the equipment and structures,” says van de Vyver.

“As a result, we worked with a specialist company to implement a complete corrosion protection refurbishment project and we also then developed and implemented a plant maintenance programme.”

All recommendations and repairs were implemented over a period of 18 months while the plant was operational.

Depending on the client's requirements, DemcoTECH offers the flexibility of a full

range of services from small retrofits, modifications, equipment installation, studies and plant audits to large turnkey contracts.

For example, in another important contract, also in Durban, South Africa, DemcoTECH supplied a mobile ship offloading and warehouse distribution system for Grindrod Terminal's existing fertilizer storage facility at Maydon Wharf 13. Grindrod Terminals is South Africa's major shipping and logistics company,

"The system, designed and supplied by DemcoTECH through an engineering, procurement and construction management contract (EPCM), replaced a trucking system with an automated and mobile conveying system, which had a major impact on the productivity and costs of the existing operation," notes van de Vyver.

The system comprises four 800tph (tonnes per hour), 1,050mm mobile (grasshopper) tyre-mounted conveyors positioned on the jetty at locations to suit the ship docking arrangements; a retracting boom conveyor; and a series of 90m-long reversible shuttle conveyors. The fertilizer is offloaded from the ships using grabs, fed onto the mobile grasshopper conveyors, which are positioned alongside the ship on the quayside and then fed onto a central 32m-long pivoting and retractable boom conveyor, which straddles the quayside. The material is then conveyed to the warehouses.

The 180m-long, existing warehouse roof structure was modified to support five 98m-long, reversible, multi-point discharge shuttle conveyors, which deposit the fertilizer in the allocated bays within the warehouses.

"An important feature to ensure optimum efficiency was the fully sequenced automatic starting and stopping of the systems, which ensures a seamless operation, with no blockages or hang-ups, and the ability to handle different types and grades of fertilizer," says van de Vyver.

Based in Johannesburg, South Africa but with a strong global footprint, DemcoTECH has been responsible for designing and installing bulk materials storage and handling facilities for a growing international client base. Its comprehensive suite of systems and technologies ranges from troughed and pipe conveyors through to moving head systems, trippers, stackers, sampling plants, tipplers, storage facilities and bulk material silos.

"Conveying cargo in loose form can potentially contaminate the environment and, vice versa, the material can itself be contaminated by the surroundings. With a clean environment now increasingly a major focus area of regulation and social pressure groups, we design and install equipment that complies with stringent

environmental and safety requirements. In addition, we offer a range of enclosed conveying technologies such as our troughed AeroConveyors™, pipe conveyors and pneumatic conveying systems," adds van de Vyver.

ABOUT DEMCOTECH

DemcoTECH is a specialist bulk materials handling and niche process plant company, offering services from concept design through to project completion to the power generation, cement, mining, metallurgical, manufacturing and port handling industries. Services include conceptual design, feasibility studies, design, engineering, procurement, expediting, construction and commissioning. Plant supplied by DemcoTECH includes troughed conveyors, air-supported conveyors, pipe conveyors, rail-mounted slewing boom stackers, pivot boom conveyors, and mobile conveyors.



DemcoTECH's plant assessment of Steinweg's Bridgeport facility in South Africa resulted in a number of improvements to the fertilizer plant.

