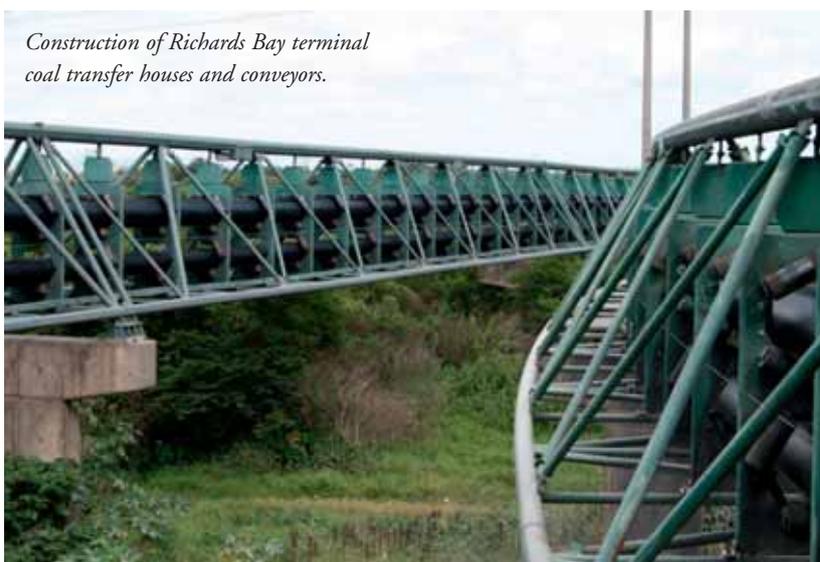


DemcoTECH Engineering: applying state-of-the-art design tools to coal handling systems

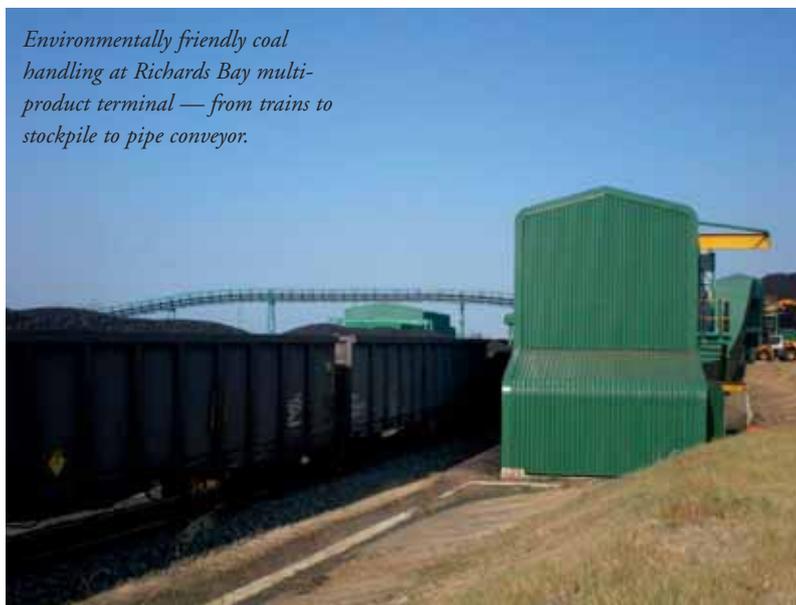
“Handling coal presents numerous challenges requiring both complex and equipment-intensive processes that involve a number of operations from offloading trains, to coal storage, to in-plant and overland conveyor systems,” says DemcoTECH Engineering General Manager, Paul van de Vyver.

“For an operation to be profitable, the entire coal handling system needs to be optimized and reliable, minimizing handling problems and plant downtime that are related to material flow throughout the entire system,” adds van de Vyver. “In addition to having access to the latest technologies, advanced testing, flow modelling and system simulation tools are also critical in designing efficient handling systems. The design of these systems must be based upon a thorough understanding of the properties of the coal,



Construction of Richards Bay terminal coal transfer houses and conveyors.

Environmentally friendly coal handling at Richards Bay multi-product terminal — from trains to stockpile to pipe conveyor.



the increasing legislative and social pressure to reduce the impact on the environment and the non-negotiable objective of safety at any operation to ensure zero harm to the workforce.”

DemcoTECH has an extensive track record in the supply of effective dust suppression and dust extraction systems, as well as in utilizing its in-house pipe conveyor design capabilities to contain, reduce and eliminate dust and environmental issues when conveying materials.

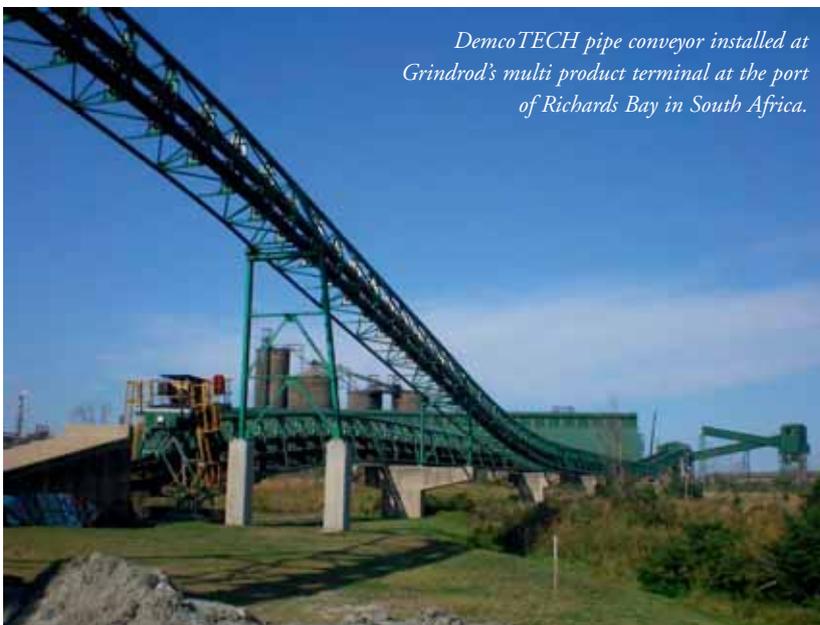
Despite the ongoing slow market conditions characterizing the coal sector worldwide, Johannesburg-based DemcoTECH Engineering continues to see the award of new projects from various coal industry players, such as power plant and port operators.

Recent project awards include the review and upgrade of the coal feed system to a 4,000MW power station which included the review and

particularly for the worst flow conditions that are expected to occur in practice with wet coal. Critical elements include determining the bin, stockpile, feeder or chute geometry, predicting accurate material flow patterns, ensuring that reclaim systems are reliable and predictable, and thorough design analysis and detailing of the entire plant.

“Much of our success has therefore been due to the fact that our materials handling design expertise, together with our finite element analysis skills for large stockyard and port machines, are supported by our in-house design capabilities and experience working with international standards such as ISO, FEM and CEMA,” says van de Vyver.

“In addition, dust is generated at any point where coal is handled and transported. Effective dust control systems are therefore also a critical element in coal handling, particularly in view of



DemcoTECH pipe conveyor installed at Grindrod's multi product terminal at the port of Richards Bay in South Africa.

evaluation of the train wagon tippler system. The work included both the concept and basic design of the system, including the development of a simulation model with the railroad engineers.

At the end of 2014, DemcoTECH was appointed to provide the detailed design for an import terminal at a Croatia Port.

“The import terminal will be a multi-product terminal offloading and handling both iron ore and coal, with the latter being the main commodity passing through the facility,” notes van de Vyver. “The project award is not only indicative of the growing demand for our services from the international market, but also from the ports and terminals sector, following the successful conclusion of the import/export iron ore terminal project we concluded for Vale in Malaysia last year.”

The latest project scope includes the entire materials handling system, handling the coal fed from the ship-unloaders through to the coal stockyards, including the train rapid rail load-out system. The system will initially offload 2,000tph (tonnes per hour) of both coal and iron ore from Capesize ships and is due to be operational towards the end of 2016.

“The system is, however, designed for future expansion up to 4,000tph,” adds van de Vyver.

The ships will be offloaded using grab type ship-unloaders and the stockpiling and reclamation will be performed using a rail-mounted bucketwheel stacker-reclaimer.

In addition, DemcoTECH is responsible for the design of the standby stockpile facility. This will utilize mobile plant feeding into mobile hoppers, which discharge onto the yard conveyor using dual vibratory feeders. The mobile hoppers can be positioned along the entire length of the new yard conveyor.

“The project presents challenges due to the fact that the system has to handle both coal and iron ore,” says van de Vyver. “This has implications for the design of both the chutes and the rail load-out system.”

The Port of Ploce is one of the main ports of Croatia and is considered a strategic port by the Croatian Government. It is located on the Adriatic coast at mid-distance from Split and Dubrovnik and is the gateway to the major north-south European corridor that connects the central part of the



Expansion to Grindrod's multi product terminal at the port of Richards Bay in South Africa.

continent with the Adriatic sea. The reconstruction of this Dalmatian port was announced in 2006 to enable the largest seagoing vessels to be able to enter the harbour.

Previous coal handling projects include the appointment of DemcoTECH by Grindrod as EPCM contractor responsible for design, engineering, procurement and construction management for the materials handling portion of the expansion to Grindrod's multi product terminal at the port of Richards Bay in South Africa. The scope of the contract was to provide the materials handling system conveying various materials, but mainly coal and rock phosphate from the three Richards Bay terminal sites: Navitrade, Kusasa and Valley.

The plant includes a tippler discharge onto three belt conveyors, one of which feeds an open stockpile or the DemcoTECH designed and supplied pipe conveyor. The pipe conveyor feeds to a transfer point at which the material is distributed to the existing export line or to a warehouse.

The 2,000tph materials handling system at the Valley terminal site was an extension to plant supplied by DemcoTECH some three years previously to convey material from terminal conveyors to feed a single warehouse. The expansion extended the lead conveyor to feed a choice of two other warehouses.

“As this was a brownfields site, the interfacing of new equipment into the existing equipment had to be carried out around planned shutdowns in order to minimize disruptions to operations,” concludes van de Vyver.

DemcoTECH Engineering 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.

After-sales services include spares, maintenance, refurbishments and operational readiness packages covering procedures, systems and workplace tools required to successfully operate and maintain a new or upgraded plant.



Tippler car at Richards Bay multi-product terminal.