Transloading efficiency

As the popularity of transloading grows, operators should consider sliding vane pump and gas compressor technology for low maintenance costs and high energy efficiency, argues Tom Stone

The main objective of transloading is to place the goods as close as possible to the point of final processing, packaging and consumption as economically as possible. Therefore, transloading can occur at any place a truck can pull up to another truck or a train. In a typical transaction, a bulk shipment moves by rail to a transload facility where it is offloaded with specialised pumping equipment that has the necessary operational characteristics to handle the specific commodity. The bulk product can then be scheduled for delivery in smaller quantities to the consignee for further processing or delivery directly to an end-user. An advantage of transloading is quick response to replenishment of inventories with transport costs kept to a minimum, while it also allows companies to accelerate turnover and reduce inventory costs.

Since transloading requires the handling of the goods at various points during the supply chain, there is an inherent risk of damage or the loss of expensive product that can potentially harm the environment or personnel. Shipping vessels must also be completely cleared of product during transloading. With all of these factors in mind, it is imperative that the proper equipment be used.

The practice of transloading has grown rapidly in recent years, so much so that it now has its own trade association. The Transloading Distribution Association (TDA), West Linn, Oregon, USA, represents the interests of the transloading industry, while positioning the process as the preferred method for efficient distribution of product in the 21st century. Currently, the TDA has more than 200 members throughout the United States, Canada and Mexico.

Economics now play an increasingly important role in a shipper's decision to move product via a transloading operation. These economic pressures have come to bear in the form of driver and equipment shortages, record high fuel costs found in long haul trucking and increased demand for shipping capacity.

A producer relying on long-distance trucking to serve a set of customers faces many difficulties. The most significant is the likeliness of empty return trips, in addition to the need for a large fleet in order to ensure service frequency. Transloading can allow these shippers to rely on a smaller fleet of trucks that need to travel shorter distances, which may also allow them to make several deliveries a day. A transloading facility can also offer a large number of value-added incentives for the shipper, including storage, blending, packaging, consolidated invoicing, combined product shipments, bar-coding and labelling.

For shippers considering the switch from a single transport mode to transloading, there are some useful benchmarks that can help guide their decision. A main consideration is whether the distance the product needs to travel is great enough to make the cost of transloading worthwhile.

As a template of sorts, 300 miles is generally the differentiation breakpoint for transloading, or essentially the distance a long-haul trucker can safely and efficiently travel in one day. Another thing that should be taken into consideration is the transportation and handling costs associated with trucking and transloading. In a true bulk transport transloading operation, a shipper can often ship out four truckloads of product on a railcar while typically paying the equivalent of only two-and-a-half truckloads in price.

Operators at this chemical distribution/storage terminal facility transload hydrogen peroxide from a railcar to a transport via a Blackmer sliding vane pump

According to the TDA, there are currently around 650 transloading terminals in the United States, with more in the works. The TDA forecasts double-digit growth in throughput by its members through 2015. The average number of available railcar positions per facility is 50. If these estimates are correct, then there is room for more than 32,000 tank cars to be unloaded at any one time. Granted, full capacity will probably never happen, but these numbers do offer an idea of the potential size of the market. Using these estimates and assuming only a 60 percent utilisation factor, each facility would require three to five pieces of off-loading equipment to keep up with demand. At the lowest level, that would be almost 2,000 units on the ground.

With that said, while transloading may make the most sense for a shipper from both an economical and logistical standpoint, the world's most efficient transloading operation will not function successfully if the pumping and compressor equipment needed to necessitate the transloading process does not work effectively.

Fortunately for shippers that are implementing transloading, there is an easy solution to their product-transfer needs; the complete line of sliding vane pumps and reciprocating-gas compressors from Blackmer. Blackmer is the global leader in transloading solutions since its sliding vane pumps and compressors are highly energy efficient and eliminate many of the maintenance concerns that are inherent in other pump and compressor styles.

The versatility of Blackmer's sliding vane technology is what makes these pumps ideal for transloading applications. They are self-priming, designed to run dry for short periods, and their high suction makes them ideal for line-stripping. They are available in cast iron, ductile iron and stainless steel models with special elastomers that make them compatible with the handling of an array of products. For self-loading trucks, the pumps come with port sizes to 4 ins and have maximum working pressures up to 175 psi (12.1 bar). They can reach speeds of 1,200 rpm with both PTO and hydraulic

This transloading application features Blackmer compressors transferring LPG from railcars to transports

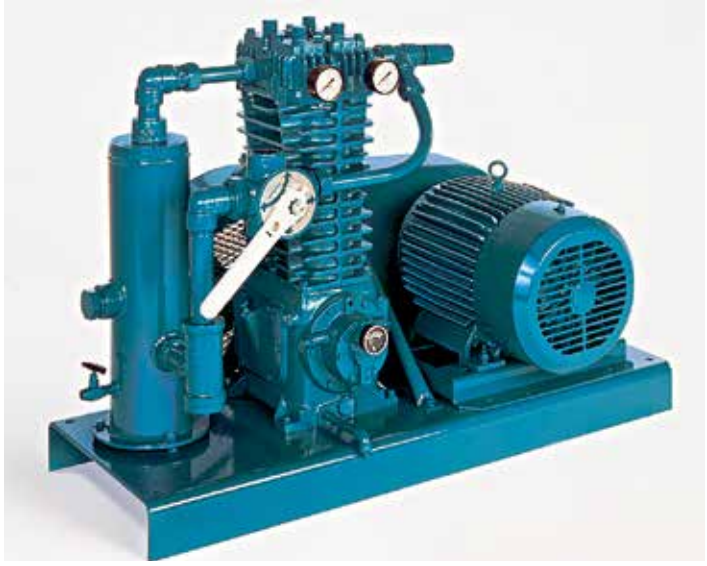
drive capabilities. For transloading that involves stationary and portable on-site pumps, by manifolding the railcars, the flow rates are basically only limited to the receiving capacity of the system. Certain lines of Blackmer sliding vane pumps are also available in a seal-less design for applications that require zero shaft leakage.

The vanes in a sliding vane pump slide freely into or out of slots in the pump rotor. When the pump driver turns the rotor, centrifugal force, rods and/or pressurised fluid causes the vanes to move outward in their slots and bear against the inner bore of the pump casing, forming pumping chambers. As the rotor revolves, fluid flows into the area between the vanes when they pass the suction port. This fluid is transported around the pump casing until the discharge port is reached. At this point the fluid is squeezed out into the discharge piping.

This simple pumping principle, which has been an industry standard for more than a century, allows Blackmer's sliding vane pumps to handle numerous types of products safely and efficiently. Among these are clean, non-corrosive industrial liquids and petroleum products; liquids ranging in viscosity from thin solvents to heavy oils; hazardous fluids; biofuels; non-lubricating solvents to highly viscous liquids or abrasive slurries; corrosive or caustic fluids; and inks, paints and adhesives.

Like the sliding vane pump, Blackmer's reciprocating-gas compressors have been designed with liquefied gas transloading operations in mind. A compressor draws vapour from the storage vessel and boosts the pressure into the top of the rail car. The increased pressure in the rail car and slightly decreased pressure in the storage vessel results in a pressure differential between the two tanks that will easily push the liquid from the rail car to storage. The result is fast and quiet liquid transfer with no NPSH or cavitation problems. These compressors are equipped with high efficiency valves, ductile-iron cylinders, self-adjusting piston rod seals and other robust features.

Blackmer LB Series reciprocating oil-free gas compressors



Blackmer's LB Series compressors not only evacuate a railcar or truck tank, they can recover vapours, as well, which is like adding 3 percent capacity to every load. They are available with transfer capacities ranging from 40-640 US gpm (150-2,420 L/min). LB compressors are designed to handle transfer and recovery of propane, butane, LPG and anhydrous ammonia. The HD Series compressors can handle the transfer and recovery of carbon dioxide, refrigerants, sulphur dioxide, chlorine, vinyl chlorine, natural gas, nitrogen and other gases.

The portability of Blackmer's sliding vane pumps and compressors has also allowed many shippers and operators of storage facilities to create moveable skids that allow the pumps and compressors to be shifted around a facility to perform transloading operations. These "transloaders" can be placed between two railcars on a siding if product needs to be pumped out of one and into the other, or positioned between and truck and railcar to facilitate transloading.

An example of how effective transloading using Blackmer pumps can be is Seeler Industries, which operates the 3 Rivers Terminal in Joliet, IL. This 100-acre facility features 17 storage tanks and 15 blend tanks. It has become one of the midwest's leading storers, handlers and packagers of hydrogen peroxide, along with other industrial liquids like caustics, amines, glycerin propylene, glycol and chemical de-icers.

The 3 Rivers Terminal is served by seven truck-loading racks and 42 railcar-unloading positions. These racks and railcar positions enable Seeler to offer transloading services to its customers. To optimise transloading options, Seeler installed a series of Blackmer STX3 and SNP3J sliding vane pumps, which are ideal for use in terminal transfer applications because their stainless-steel construction makes them compatible with the chemicals, solvents, caustics, sulphates and acids that the terminal handles on a regular basis.

To increase its options, Seeler also had a Blackmer SX3 sliding vane pump mounted on a portable cart that is moved wherever it is needed in the facility. (See Figure 1.) This pump features a gear reducer that allows it to run at two speeds, 90-100 gpm when offloading a railcar and 60 gpm for drum and tote filling. The pump's engine drive also allows it to be used even when there is a power failure.

Thomas L. Stone is PSG director of marketing for Blackmer, based in Grand Rapids, MI, USA