

Bearing A Heavy Load

In the search for the best way to optimize its motor-fuel transloading applications, Petrogas finds the perfect partner in Blackmer® and its TX4 Sliding Vane Pumps

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Since Mexico imports a high percentage of its motor fuels, much of which arrives via railcar, transloading is a critical application in the supply chain as that imported fuel is transferred from railcars to transport trucks. Petrogas Corporation has optimized the transloading process through the inclusion of Blackmer® TX4 Sliding Vane Pumps on its mobile transloading skids.

Introduction

Since its founding nearly 30 years ago in Monterrey, Nuevo Leon, Mexico, Petrogas Corporation has grown into the leading full-service designer, outfitter, maintainer and product supplier for the country's retail service station industry. As such, the company now operates 14 regional offices in Mexico and one in Texas, and its client list includes many of the leading and most recognized service station brands in Mexico.

"We started as a small company, but Petrogas has built a long, rich history through our ability to create and build big and lasting projects that meet the needs of our clients," said Javier Vargas Elizondo, Director General of Petrogas. "Today, we are Mexico's strongest and most experienced company in the design, construction, outfitting and maintaining of service stations, and the supplier of all equipment and accessories necessary for the loading and unloading of fuel-transport vehicles."

A crucial link in the chain of Petrogas' success is ensuring a reliable supply of fuel for its retail partners. As a whole, the country of Mexico does not produce enough crude oil to meet domestic motor-fuel supply demands. Therefore, the country imports a high percentage of its liquid fuels from all over the world, with the majority arriving via railcars and tank vessel.

QUICK FACTS

- COMPANY: Petrogas Corporation
- LOCATION: Monterrey, Nuevo Leon, Mexico
- MARKET: Motor-Fuel Distribution
- CHALLENGE: Identify and utilize a robust, reliable transport pump that could optimize the transloading of motor fuels from railcars to truck transports for a national distribution network
- SOLUTION: Blackmer® TX Series Sliding Vane Pumps



Easing The Load

Once the fuel arrives at the various Mexican terminals, it is either loaded onto transports for transfer to other smaller terminals or delivered to stations throughout the country. Petrogas has supply agreements with many of these terminals and has access to thousands of gallons of fuel every day, which is then dispersed to storage depots and the retail locations of its clients via a fleet of transport trucks. A critical step in this supply setup is the transfer of the motor fuel from the railcar to transport trucks in a process known as “transloading.”

Basically defined, transloading is the practice of transferring products, which can run the gamut from petroleum products and industrial chemicals to animal fats and vegetable oils, between modes of transportation. In a typical transloading transaction, the bulk shipment moves by rail to a transload facility where it is offloaded into a lower volume, more versatile and nimble form of transportation, most often a transport truck.

The main challenge in building a successful transloading operation in Mexico is found in the capabilities, or lack thereof, of the country’s fuel-delivery infrastructure.

“There are many terminal locations that just do not have a large enough infrastructure,” explained Ricardo Jimenez, Technical Specialist for Petrogas. “Mainly, the lack of infrastructure to accommodate the large number of transport trucks that need to receive fuel from the railcars. This can delay transfer times, which creates inefficiencies in the fuel-transfer system.”

As a solution, in 2018 Petrogas designed and built a proprietary series of mobile skids – today, 16 (and growing) are in operation – that are outfitted with a transfer pump, motor, flow meter and all of the connections needed to unload the fuel from the railcar. Initially, Petrogas used centrifugal pumps on the skids, but soon discovered that there were some shortcomings in their operation that were affecting the overall performance of the skids.

“We were using centrifugal pumps, but they do not have the capability to remove all of the liquid from the tank,” recalled Jimenez. “Because of that, there was always a liquid heel in the railcar that was impossible to pump.”

Excessive “heels,” or the amount of liquid left in railcars at the conclusion of the unloading process, which, in some instances, can be 500 liters (132 gallons) or more, are problematic for two reasons: 1) that is saleable fuel that was promised to Petrogas and, by extension, its customers, that was not delivered, and 2) the remaining fuel in the railcar may not be of the same type or grade as the next load it would take on, creating the chance that gasoline might be mixed with diesel, or vice versa, which can have far-reaching negative effects.

Sliding Into Position

With the shortcomings of centrifugal pumps identified, Petrogas went in search of a better alternative, one that could strip railcar tanks and transfer hoses while delivering the flow rates necessary for high-volume liquid transfer. That search ended with the positive displacement (PD) TX Series Sliding Vane



Javier Vargas, Director General of Petrogas, left, and Ricardo Jimenez, Technical Specialist for the company, have built Mexico’s largest, most efficient and reliable motor-fuel transport network with the notable aid of Blackmer® TX4 Sliding Vane Pumps. “We have only had success so far with the Blackmer TX Pumps,” said Jimenez.



Transloading, or the process of transferring liquid products from one mode of transportation to another, is critical in Mexico's motor-fuel supply chain. The design of Blackmer® TX4 Series Sliding Vane Pumps enables them to produce high flow rates and strip liquid "heels" from railcars, resulting in a more efficient, time-sensitive and cost-effective motor-fuel transfer process.

Pump from Blackmer®, Grand Rapids, MI, USA, a product brand of PSG®, Oakbrook Terrace, IL, USA, a Dover company.

The versatility of sliding vane technology is what makes Blackmer TX Series Pumps ideal for transloading applications. They feature a number of vanes that are free to slide into and out of slots in the pump rotor. When the pump driver turns the rotor, the vanes 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 120 years, allows Blackmer Sliding Vane Pumps to run dry for short periods of time and perform self-priming and line-stripping duties.

The TX Series Pumps, which are constructed of cast iron, are part of the Blackmer Iron Line of pumps and feature a side-inlet/top-outlet design that delivers fast and quiet operation during stationary or mobile liquid-transfer operations. They have external roller bearings that support the rotor from both sides, which stabilizes the mechanical seals; symmetrical bearing support for even wear; and an adjustable relief valve that protects against excessive or fluctuating operating pressures. All of these design features enable the TX Series Pumps to produce flow rates up to 1,911 L/min (505 gpm) at working pressures up to 15.5 bar (125 psi). Additionally, the method of

operation of the TX Pumps enables them to effectively handle liquids with a high range of viscosities and their line-stripping capabilities allow for a quick and easy transition from one type of liquid to another, which saves time.

To illustrate how effective the TX Pumps have been in performing critical line-stripping duties, one of Petrogas' customers has to unload 240 railcars a week. With each railcar having a capacity of 110,000 liters (29,059 gallons), that is a total of 26.4 million liters (6.97 gallons) of fuel that is being transloaded every seven days. If 500 liters were left behind in each load, that would be 120,000 liters (31,700 gallons) that would not reach its final destination.

"When we changed to the Blackmer TX Pump, all of the liquid heel that was on the railcars was able to be pumped out, and the versatility, or the ability to operate as needed despite changes in pumping conditions, of the pumps is great, which we did not have with the centrifugal pumps," said Jimenez. "Another benefit is that the TX Pumps are 18% to 20% cheaper than other PD models that need a gear reducer; when you have 200 to 300 pumps, that's a lot of money that is saved."

Initially, Petrogas standardized with the 3-inch TXD3 model on its skids to transload both gasoline and diesel, and on its transport trucks. However, Jimenez began to notice a loss of efficiency in some transloading instances, namely that when the 3-inch pump was used with gasoline the flow rate would



Since the Blackmer® TX4 Sliding Vane Pumps have been installed on Petrogas' fleet of mobile transloading skids, they have been pumping an average of one million liters (264,000 gallons) per day with no need for maintenance or repair.

decline as much as 25% when compared to diesel. The solution to this challenge was a simple one: all of the skids, whether they are used for gasoline or diesel, are now equipped with 4-inch Blackmer TX Pump models.

"While we were able to pump up to 1,000 L/min (264 gpm) of diesel with the 3-inch pump, we noticed a decline in flow rate when it was used with gasoline, so that's why we upgraded our gasoline skids to the 4-inch pump; with the increase in diameter, we can get the same flow," said Jimenez. "The TX4 Pump enabled us to use the same skid configuration, but its ability to deliver higher flow rates, along with the ability to clear long suction pipes of 20 to 25 meters (66 to 82 feet), made it more cost-effective."

The TX4 Pumps have so seamlessly fit the sweet spot for one Petrogas customer that more than 70 million liters (18.5 million gallons) of diesel have been transferred since the pumps began being used and not one minute of operational time has been lost to maintenance or other forms of downtime.

Conclusion

Petrogas has become the preeminent fuel supplier to service stations in Mexico because of its commitment to providing the best service in all instances. Reaching this status also required that the company identify and work with channel partners who have the same mindset. When it came to outfitting its mobile transloading skids, Petrogas found a kindred spirit in Blackmer and its TX Series Sliding Vane Pumps, specifically the TX models, of which Petrogas plans to buy more.

"We decided to go with the Blackmer TX because we saw that the flow was high, which means they provide better performance," said Jimenez. "Another important reason is that the terminal doesn't have as many transports lined up to fill since the TX reduces the transloading time. Every pump is also pumping one million liters (264,000 gallons) per day and we have not have had any maintenance or repair claims. We have only had success so far with the Blackmer TX4 Pumps."

About the Author:

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