



Pat Wenner, vice president of the Rockville Propane Terminal, has taken advantage of significant shifts in the propane supply and distribution market in Minnesota using reciprocating gas compressors.

Increasing LPG Loading and Unloading Speeds

Mix imaginative thinking, the willingness to take risks, and the right pump and compressor equipment and you get the growing trend of ultra-high-speed loading and unloading of LPG

By Thomas L. Stone

There's no doubt that, as the years have passed and technology has advanced, our lives have sped up in so many areas. Cell phones and email have compressed communication intervals. The length of the current news cycle is now measured in minutes rather than days. Time-intensive tasks can now be completed in seconds with the help of the Internet and the tap of a few icons on a smartphone or the click of a few buttons on a computer keyboard.

In the world of petroleum-product delivery and supply, one area in need of increased speed was the loading of LPG transports and bobtails. Long lines at LPG storage terminals have been a common sight for years as

transport trucks queued up and waited...and waited...to acquire their loads. This wait time is even more frustrating during those times of year when LPG demand is at its highest, such as the winter-heating or crop-drying seasons in the Upper Midwest.

Now, some innovative thinking and the willingness to take a calculated risk have combined to create a new trend in LPG delivery and supply: ultra-high-speed loading of transports and bobtails. These impressive new transfer rates have been attained with the aid of sliding-vane pump and reciprocating gas compressor technology.

The Need for Speed

When Altogas, an Alto, Mich.-based supplier of LPG, decided that it would move forward with its plans to build the new Red Arrow Transfer Terminal in Benton Harbor, Mich. several years ago, general manager David Hast tasked his business development manager, Scott Tonkin, with designing the facility. When Tonkin came back to Hast with his plans, he was proposing a

1000-gallon-per-minute (gpm) LPG throughput rate for the terminal.

We told Scott “...nobody’s done that and there’s got to be reasons,” recalled Hast. “He also talked to several people we know and have worked with and they said, ‘No, you’re not going to do that, it’s not possible,’ but he’s a hard sell.”

One of those “other people” was Kevin Pruitt, director of integrated systems for Gas Equipment Co. (Dallas), the distributor that supplies Altogas with its LPG-handling pumps and equipment.

“I received a phone call from Scott and he threw out a flow rate that scared the heck out of me.... My first reaction was, ‘Scott, I don’t want to promise you I can do that and under-deliver.’ He said, ‘Will you work with me to try to get there?’ and I said, ‘Absolutely....’”

The number 1000 was not one that Tonkin pulled out of thin air or decided upon because it was a nice, round figure. He performed the necessary due diligence, discovered the highest flow rate that was currently possible, and put his faith in his ability to create a loading system that could push the upper limits of loading speed to four figures.

A Bit Excessive?

“We shopped for a number that a lot of people thought was a bit excessive for the gallons per minute,” admitted Tonkin. “But after talking to a lot of transport drivers, the fastest anybody could remember seeing was 850 gpm, which is a fairly large number when it comes to loading an LPG transport, but why not do something different? That’s why we built it—to see what would happen.”

With the flow-rate goal defined, Tonkin set about finding the equipment that would make it possible. Driving the flow of LPG through the system piping from storage tank to transport would be the pumps, and after consulting with Pruitt, Tonkin decided sliding-vane pump technology would be the best choice for the operation.

“We looked at all kinds of pump curves out there and settled on Blackmer sliding-vane pumps for this application,” said Pruitt.

The Red Arrow operation requires four 4-in. sliding-vane pumps. The pumps chosen feature a cavitation-suppression liner that reduces noise, vibration, and wear, as well as replaceable casing liners and discs that allow for rebuilding of the pumping chamber.

But the proof would be in the pudding.

“I’ve always liked to do things that sometimes other people haven’t tried yet,” said Bernie Vanderboegh, president of Altogas. “I didn’t think we could do 1000 gpm either, so I remember when they first cranked it up the surprise from everyone, the adjectives when those meters were reading 1000 gpm; that was quite a pleasant experience.”

If pursuing a 1000-gpm LPG flow rate was impressive, imagine the disbelief that must have greeted brothers Jim, Pat and Carl Wenner when they announced—in 2009, during the height of a stubborn economic recession—that they would proceed with plans to build a new LPG storage terminal near Cold Spring, Minn., just up the road

from the town where the Wenner family has operated numerous businesses since the 1880s.

“I thought it was a pipe dream,” recalled Jeff Munzel, vice president of LPG & NH₃ Supply Inc., a Buffalo, Minn.-based supplier of equipment and service for Minnesota’s LPG marketers.

The Wenner’s determination was driven by the fact that rail service would be ceasing to Cold Spring, where the company had an existing LPG storage facility. The Wenner’s bought a plot of land to the northeast of Cold Spring along Route 23 and equipped it with five railcar unloading platforms and 300,000-gallons-worth of LPG storage capacity. The facility was an immediate hit, but went to the next level in 2014 when Kinder Morgan Pipeline Energy Partners LP completed the reversal of the Cochin pipeline, which meant that LPG would no longer be shipped into the state from Alberta.

Sensing an opportunity to fill the new LPG-supply void, the Wenner’s contracted with Reggie Fraley of Alpha Development & Construction LLC (Cold Spring, Minn.) and partnered with CHS Inc. (Inver Grove Heights, Minn.), a farmer-owned cooperative and a retailer of propane throughout the U.S., on an expansion of the facility, which now has 10 rail loading towers and 620,000 gallons of propane storage.

“With the pipeline going down, it was a big leap for us to go from being a back-up standby terminal to one that is the main choice in the area, but we knew that rail would have to play a bigger role in the state’s propane supply chain and the opportunity was too good to pass up,” said Pat Wenner.

On the rail unloading end of the operation, the facility, which has been renamed the Rockville Propane Terminal, is outfitted with 10 reciprocating gas compressors that have the ability to perform both liquid transfer and vapor recovery. For the transport and bobtail loading operations, the LPG islands are outfitted with 4-in. sliding-vane pumps.

“We took what was existing at the Wenner terminal and basically doubled it—storage capacity, unloading capacity, number of towers, and put in a second loading island,” said Scott McClelland, engineer at LPG & NH₃ Supply.

Most importantly, the pumps and compressors have been able to keep up with the loading and unloading rates that are required, and have not flinched even on those busy days when more than one million gallons of LPG have made their way through the terminal.

“With the 10 Blackmer compressors, we can unload 15 railcars every six or seven hours, and with the four Blackmer loading pumps, we can do two transports every 15 to 20 minutes,” said Wenner. “We have done as many as 30 to 40 cars per day into the terminal, up to one million gallons into the terminal, and we can do even more. The terminal can move 100 million gallons a year, if we get to the point where we need to move that much volume.”

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