

PumpSmart® Improves Fuel Blending Operations at Motiva

Product quality is one of the many objectives of Motiva Enterprises, LLC, which operates the eastern and southeastern US refining and marketing businesses of Shell Oil Company and Saudi Aramco. The company operates four refineries with a total capacity of 860,000 barrels a day, and it sells fuel at about 11,000 Shell and Texaco branded gas stations. Motiva and sister company Shell Oil Products US, which operates in the West and Midwest, together are the marketers of the #1 selling gasoline in the United States. Motiva strives to operate all of those distribution resources at peak performance and within government regulations.

CUSTOMER PROBLEM:

In response to governmental mandates to eliminate the use of methyl tertiary butyl ether, or MTBE, as an additive to gasoline, Motiva uses ethanol. This application required blending up to 10% ethanol by volume by means of injection into the gasoline stream during truck loading. In different parts of the country, other companies reported problems with the injecting stream resulting from inadequate pressure control.

This was a perfect application for PumpSmart. By keeping a constant pressure on the header and injection system, ethanol could be injected at a rate necessary to obtain the desired blend into each truck from the multiple-bay loading rack.

In addition to enhancing the injection and blending process, constant pressure control allowed the pump to vary the speed to maintain a set pressure in the main header as the flow fluctuated by the addition or deletion of tank trucks loading.

Motiva had earlier experience with PumpSmart on gasoline loading. They were sold on PumpSmart's ability to eliminate cavitation experienced when loading a single truck or operating below minimum flow. Prior to using PumpSmart, Motiva had also experienced the inefficiency of kicking on an additional pump simply because another truck required loading.

ITT SOLUTION:

However, in this application, as the primary pumps reached maximum capacity and the set pressure could no longer be achieved, the PumpSmart would turn on an additional (fixed speed) pump. In response, the PumpSmart unit would serve as the trim pump to balance the supply with the need. Four separate gasoline distribution terminals in the Northeast US were equipped with a PumpSmart PS200 to operate two Goulds 3996 in-line process pumps in multi-pump operation using constant slave mode and pressure control. The two pumps were piped in parallel with a pressure transmitter in the common discharge line.

THE BOTTOM LINE:

John Booth, Technical Manager, Distribution with Motiva commented on the PumpSmart difference. "In my opinion, PumpSmart will allow a more uniform ethanol flow into the base gasoline. This should help assure a more consistent ethanol content under all operating conditions. We should experience fewer product quality issues, reduce the reliance on other mechanical systems to manage flows as a function of pressure variations and provide a more reliable overall system. The added benefit should be continued cost saving. Since the ethanol must operate at a higher pressure than the base gasoline, we also expect to prevent any line shock problems."

Motiva experienced improved ethanol injection and blending characteristics by PumpSmart's ability to maintain constant pressure. Eliminating the possibility of cavitation during times of low demand was an additional benefit and pump life cycle enhancer. Lastly, by balancing the supply with the need, PumpSmart is able to produce significant energy savings compared to fixed speed pumps over the life of the equipment.



Goulds vertical in-line Model 3996 process pumps, controlled by PumpSmart, help provide the correct blend of ethanol and gasoline at Motiva distribution terminals in the Northeast USA.



PumpSmart PS200 controls process pumps at Motiva fuel distribution terminals