

# PumpLines

Innovation... Technology... Leadership

## 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.

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.

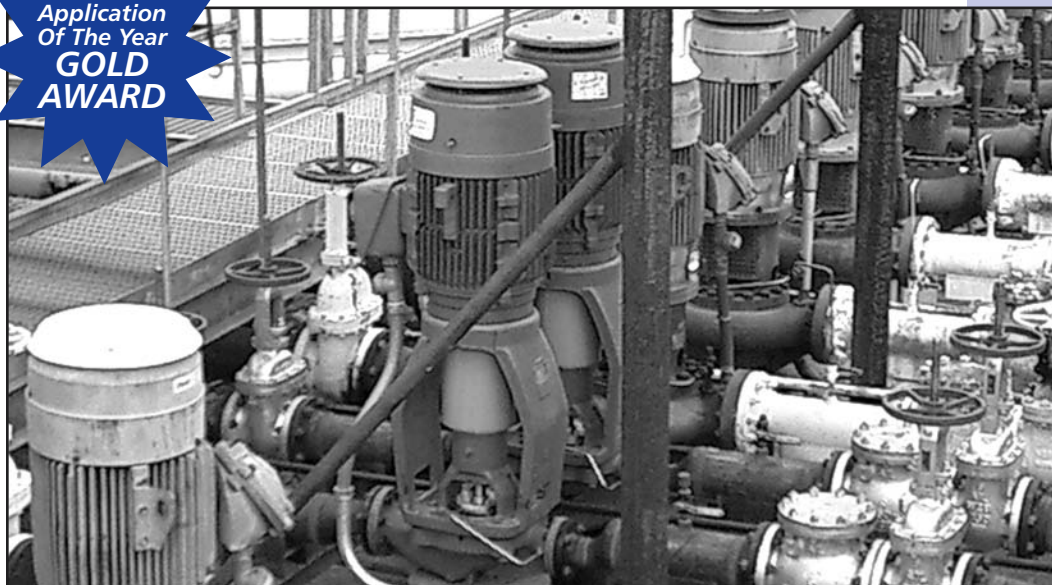
In addition to enhancing the injection and blending process, constant pressure control allowed the pump to vary the speed to maintain a set pressure in the main header as the flow fluctuated by the addition or deletion of tank trucks loading.

Motiva had earlier experience with PumpSmart on gasoline loading. They were sold on PumpSmarts' 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.

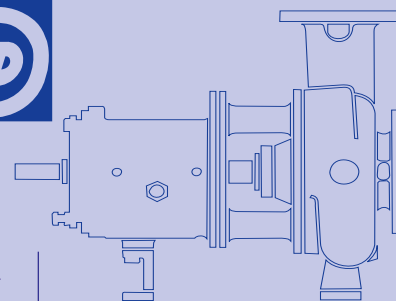
However, in this application, as the primary pumps reached maximum capacity and the set pressure could no longer be achieved, the PumpSmart would

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Application  
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AWARD**



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.



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Goulds Pumps



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## Motiva...

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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.

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. ■



PumpSmart PS200 controls process pumps at Motiva fuel distribution terminals.

## New Products

### **New PumpSmart® Model 200 Version 3.0 Provides The Latest in Variable Frequency Drive Technology**

PumpSmart Control Solutions has introduced PumpSmart 200 Version 3.0, a major addition to the award winning PumpSmart product line. Like previous PumpSmart offerings, the new Model PS 200 Version 3.0 is a microprocessor based variable speed drive, programmed specifically for centrifugal pumps up to 700 HP.

The new Model 200 Version 3.0 provides the following drive construction improvements: a reduced number of components, a smaller physical size and weight of each drive, "plug & play" fieldbus and analog input/output extension modules. It also features expanded simplification and functionality making it ideal for a wide range of applications where previously process controllers were too costly and complex. For example, the number of parameters needed for set up and start have been reduced to only seven (7) for a single pump pressure control application.

In addition, the new model allows a user to start up to three (3) fixed speed pumps compared to only one in earlier PumpSmart 200 models.

The continuous monitoring and reaction to both pump conditions and systems allow accurate control of virtually any process parameter demands. The PS Model 200 Version 3.0 will alert the user that a sensor has failed and then automatically change to speed control. The resulting speed is the average speed for the last minute of operation prior to instrument failure. The Model 200 Version 3.0 offers both fixed and variable dual setpoints. On variable setpoints the user is able to receive a second 4-20mA signal and continuously vary the setpoint whenever suction conditions are at a level that would cause cavitation.

The Model 200 Version 3.0 contains a pump wear monitor, which enables it to automatically identify pump performance decreases due to the wearing of hydraulic components. This wear monitor works on any centrifugal pump and does not require performance data to be fed into the drive. The Model 200 Version 3.0 provides multi-pump control, controlling up to four pumps in coordinated fashion to meet system demand and maximize pump performance and reliability. In addition, the units can alternate lead and lag, as desired.



PumpSmart® 200 version 3.0

As with previous PumpSmart models, energy savings in the 30-70% range are obtained because at lower demands, the PS 200 Version 3.0 reduces the motor speeds eliminating the extra energy that's used to overcome the pressure drop of control valves. This new model can be applied to any centrifugal pump in a wide range of applications including: cooling water, transfer and loading, paper stock pumps, reboiler and bottom pumps, wastewater, filtration, slurry pumps and boiler feed. ■

### **INPRO VBXX-D Now Standard on Goulds ANSI Family**

Goulds Pumps is now offering INPRO VBXX-D Isolators as standard equipment on many of our ANSI Process pumps. The new VBXX-D is not just any labyrinth oil seal, but offers the latest technology in bearing isolation, increasing bearing protection which ultimately leads to greater reliability and increased plant uptime.

The INPRO VBXX-D Isolator has upgraded design features, advantages and benefits that provide levels of protection previously unavailable in any kind of bearing protection device. Enhancements and improvements include the best possible interface for contamination exclusion as well as next generation design for oil retention with a tried and proven vapor blocking O-ring. This internal O-ring not only provides protection during operation, but will seal the housing when the pump is in a static condition to protect against other common contamination like wash-down water or dust.