



# PumpLines

Innovation...Technology...Leadership

FALL 2002

## PumpSmart® Relieves Maintenance Headaches at Millennium Chemical

*At a chemical plant in Brunswick, Georgia, a process pump was encountering operating conditions that produced a mean time between failure of only 17 days. With the installation of the PumpSmart control system from ITT Industries, pump repairs, maintenance and energy usage have all been dramatically reduced.*

Millennium Chemicals is a major international chemicals company, with leading market positions in a broad range of commodity, industrial, performance and specialty chemicals. Among the products from Millennium are terpene-based fragrance and flavor chemicals produced at their plant in Brunswick, Georgia. These fragrances are used in consumer products such as detergents and soaps. Consumer products companies such as Procter and Gamble will use Millennium fragrance bases to make their product's ultimate fragrance.

### A MTBF of Only 17 Days

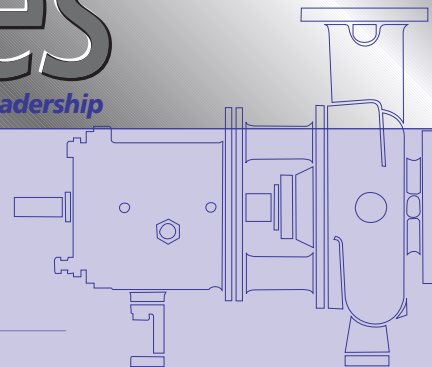
In one application at Millennium's Brunswick plant, a

Goulds 3196 XLTX centrifugal pump was being used in a distillation tower as a circulating pump. The Goulds pump was recirculating the liquid through a heat exchanger and back through a reboiler, keeping it hot.

Running at a fixed speed, the pump was pumping out of a tank to fulfill a process need of a batch chemical process. As the level of liquid in the steel pot was distilled off, the level would go from 100 % to virtually 0%. As a consequence, the pump was experiencing dramatically different head conditions. With the severe operating conditions in this service, the pump was experiencing mechanical seal failure every 17 days on average.

According to Troy Greaves, the Sales Manager of PumpSmart Control Solutions, "This pump would work fine except for the last hour of each process when there was insufficient NPSH. Because they were pumping the tank out, the pump would experience extreme NPSH cavitation, which would

*continued on page 2*



### IN THIS ISSUE:

#### Feature:

*PumpSmart® Relieves Maintenance Headaches at Millennium Chemical* .....Page 1

*A-C Pump Launches New Website www.acpump.com*.....Page 2

#### Tech Talk:

*ITT Tech Fair Promotes New Technologies*.....Page 3

*Virginia Student Wins ITT Sponsored Stockholm Junior Water Prize*..... Page 4

#### Product News:

*PumpSmart PS200 Named Finalist in Product of the Year Competition* .....Page 4

*Going Hog Wild! Lean Manufacturing Results In Price Reductions on Trash Hog® Pumps*.....Page 5

#### Material Matters:

*Duplex Stainless Steels For Sea Water Service* .....Page 5

#### Service Solutions:

*Innovation Reduces Refinery Costs*.....Page 7

*Sealless Vertical Sump Pump Provides Efficient Operation* .....Page 7

*ITT ProCast Offers Pump Parts On-Line*.....Page 8

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## Millennium...

continued from page 1

rapidly deteriorate the mechanical seal of the pump."

With only 17 days between failures, the failures were costing Millennium approximately \$54,000 per year just in seal replacement. Greaves noted that, "The pump was fine for the service, but the operating conditions were killing the seals."

Frank Upton, maintenance manager for Millennium said that, "We were running a double seal pressurized fluid pot, but cavitating the heck out of it. When the pump was cavitating, you could hear it from the parking lot."

### A Perfect Case for PumpSmart

Chris Van Dyke, the branch manager for Hudson Pump, the local Goulds Pumps distributor recalls, "Millennium is my responsibility. Frank Upton and I were doing a plant survey to identify his top ten pumps that were experiencing the highest failure rates. We were going to start by doing a complete system survey." During the survey, Upton noted that the bottoms pump was definitely his highest failure rate pump. Van Dyke recalls that, "It jumped out that this would be a perfect candidate for PumpSmart."

After viewing a PumpSmart seminar for Millennium's plant and process engineers, Upton decided to target a PumpSmart for this problem application. "I figured that the VFD would be perfect because the process conditions change as the steel pot level decreases and as that level decreases, the PumpSmart slows the pump down."

### How PumpSmart Works

PumpSmart is a control system that uses a standard centrifugal process pump in conjunction with ITT Industries' unique and patented PumpsSmart Control System and Software.

The software, which resides on the controller microprocessor chip, is the "brains" of the system, allowing the pump to monitor and react to any system condition. As a result, PumpSmart automatically reacts to process system changes and upsets and will not cavitate, run dry or run against a closed suction or discharge valve.

In a situation such as the Millennium Chemical pump installation, PumpSmart detects the changing conditions and prevents the pump from cavitating. The pump will react by stopping, slowing down, alarming or any combination of these actions, depending upon how the PumpSmart controller is programmed.

### No More Seal Failures

The PumpSmart drive was installed on the Goulds pump at Millennium. There were no other changes to the pump. The process of the mechanical and electrical installation took place in a single day, with the calibration taking another half day to accomplish.

Since being installed, the pump has gone from an MBTF of 17 days to almost no failures. After 185 days, a seal that had already been running under the unprotected conditions before PumpSmart was installed failed. There have been no other failures in the past fourteen months.

Now when the level in the suction tank drops, the PumpSmart controller slows down the pump gradually and does not let the pump cavitate. Before PumpSmart, the pump was running at a single speed. Now it finds the level at which it has enough static head to operate.

According to Greaves, "The nice thing is that Millennium has been able to increase their product yield because they can run the pump longer. With the non-controlled pump, they had to shut off sooner just to get the 17 days of operation." Upton notes that, "The productivity enhancements have been great. **There is now zero downtime. Productivity has increased from 5%-10% because we can now get more out of the steel pot.**"

### Dramatic Energy Savings

According to Upton, energy savings with PumpSmart have also been remarkable. "We are saving \$25 a day based on 4 cents per kilowatt hour." Millennium had been using a 40 horsepower motor running the pump at 1,200 rpm for this application. The application of PumpSmart as a control system for this pump proves the oversized condition of that pump motor. Upton continues, noting that, "We are currently using between 7 and 10 horsepower now and running the pump at between 550 and 700 rpm. **I could justify the PumpSmart alone on the \$25 a day of energy savings.**"

The Millennium facility has recently installed a second PumpSmart unit on a Goulds 3196 process pump. This process pump is being used in pump out duty and as circulation for filters. As the filters begin to clog, PumpSmart will speed up the pump to maintain the flow until a certain Delta-P is reached. When that point is reached, a PumpSmart will shut down the pump.

Van Dyke said that an assessment of the first PumpSmart installation was made and, "It turned

out that if you look at energy, maintenance and downtime, the PumpSmart installation has paid for itself in just over 60 days."

### Summary of Savings

**Enhanced Reliability Seal replacements @ \$2,500**

**Labor (2 @ \$50 x 8 hours) = \$800**

**\$3300 x 21 Failures/Year = \$69,300**

**Energy**

**\$25/day (based on \$.04/kwh) = \$9,125**

**Total Annual Savings = \$78,425** ■

## A-C Pump Launches New Website

[www.acpump.com](http://www.acpump.com)

A-C Pump, one of the Industrial Product Group brands, has launched an information-filled website for water and wastewater pump users. This new pump portal enables you to navigate through pump types to select the specific A-C model to meet your specifications. Complete parts information, including a specially priced, excess inventory listing can also be accessed. Downloadable sales brochures fully outline the features and capabilities of each product line. Installation, Operations and Maintenance manuals can also be read and downloaded to help keep your A-C (Allis-Chalmers) pumps running at peak performance. All of the latest technical news and product releases are also available at [www.acpump.com](http://www.acpump.com).

A-C Industrial pumps (which have been integrated into the broad line of Goulds Pumps) and A-C Fire Pump Systems can both be accessed via prominent, home page links. ■

The screenshot shows the A-C Pump website interface. At the top, there's a header with the ITT Industries logo and navigation links: HISTORY, LITERATURE, NEWS, CONTACTS, CAREERS, SITE MAP, SEARCH. Below this, the main heading is 'A-C Pump'. There are two columns of images: 'Municipal Pumps' and 'Industrial Pumps'. To the left, there's a sidebar with 'Municipal & Industrial Pumps', 'AC', and 'FIRE PUMPS'. The main text area contains a paragraph: 'A-C Pump (formerly the Allis Chalmers Pump Company) has been a respected player in the pumping industry for over 125 years. A-C Pump is well known as a manufacturer of quality pumps for water, wastewater, mining, fire, and fluid control markets.' Below this, it says 'A-C Pumps were purchased in 1985 by ITT Industries joining other premier pump brands such as I-Eng, Goulds Pumps, Uell & Gossett and others to form the world's largest pump company.' At the bottom, it says 'The Fluids Companies of ITT Industries' and '© 2002 ITT Industries, Inc. All Rights Reserved'.