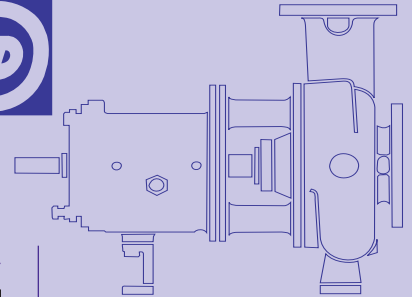


PumpLines

Innovation... Technology... Leadership

New ITT Group Stresses Power of One



William E. Taylor has been appointed President of the Industrial and BioPharm Group of ITT Industries. This new group, formed from the Industrial Products Group and the Engineered Process

Solutions Group, will manufacture and market ITT's complete line of pumps, valves, controls, and service solutions globally. Its premier brands include Goulds Pumps®, A-C Pump®, Richter™, PumpSmart®, PRO Services®, Pure-Flo®, Fabri-Valve®, Dia-Flo® and ProCast™. Serviced markets include chemical, paper, power, HPI, mining, general industrial, water and wastewater. In addition, the group will continue its leadership role in the growing pharmaceutical and biotechnology markets, supplying hygienic valves, tanks & vessels, skids, process modules and custom fabrications.

Bill Taylor joined ITT in 2003 and has been a key contributor to the positive results demonstrated by the Industrial Products Group. He had previously served as President of Delta Companies Consolidated Inc. and Sundyne Corporation. Mr. Taylor received his Bachelor's Degree in Technical Management from Regis University and is a member of the American Society of Quality Control, The American Society for Testing & Materials and is a member of the Hydraulic Institute.

Bill commented on his new ITT group. "This realignment of our industrial businesses will allow us to take advantage of the Power of One to grow our businesses more quickly, expand our international footprint and deliver enhanced value to our customers."

The ITT Industrial and BioPharm Group has 18 manufacturing plants and 15 service facilities worldwide with over 3,000 employees. The combined revenues of the group in 2004 exceeded \$550 million (US). ■

The Hot Trend in Maximizing Assets is Predictive Condition Monitoring

A Major Trend Setter is Casco Inc.

The pressure is on There's no doubt about it, today industry faces challenges that were unheard of only a short time ago. Global competition, higher energy costs, and the spiraling expense of having plant equipment down for repair, all contribute to a corporate culture that pushes each and every employee to find ways to do things better, cheaper, and faster. The key to competing today is to get the most out of your people, your manufacturing process and your plant

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Goulds Pumps

ITT Industries
 Engineered for life

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equipment. In short, optimize your plants assets. To be successful today a company must be able to plan better for the future, and be proactive in their maintenance and repair operations.

Until recently, industry relied mainly on the knowledge and expertise of veteran operations personnel. Just as you get used to the sounds and feel of the automobile you drive 365 days a year, operators know their equipment. As they do their walk-arounds, they can distinguish minute changes in motor pitch or an unusual rattle in a pump casing. By touching a bearing housing and sensing the heat, they can tell you a bearing is wearing and may fail. Maintenance would be alerted, they would turn-off the affected pump (and the process), and the pump would be inspected and repaired. Unfortunately sometimes the warning signals are missed resulting in a catastrophic failure. Instead of planned maintenance a much more extensive repair or even replacement might be required. The possible cause for all of these problems could have been a simple bad bearing. Personnel walk-arounds are "hit and miss." They waste valuable man-hours, cause system downtime, lost production and result in increased maintenance costs. With attrition eating away at valuable manpower assets, there had to be a better way.

Maintenance Meets the 21st Century

Most equipment failures give some warning that they are about to occur. What industry needs is a way to head off a catastrophic failure before it has a chance to happen. The answer lies in a technology called predictive condition monitoring. With a predictive condition monitoring (PCM) system, the bearing problem could have been picked-up by vibration and temperature sensors weeks earlier to avoid a system shutdown. The repairs could have been scheduled at a convenient time to minimize downtime and lost production. With predictive condition monitoring a plant's assets are maximized by:

- Avoiding failure and extending equipment service life and reliability through continuous predictive monitoring



Condition monitoring all PROsmart instrumented pumps at a single glance.



Installation of the Communication Module in the CASCO Tank Farm.

- Immediately alarming the proper personnel regardless of the time or distance. This reduces the chance of failure occurring before maintenance can get to the problem. Minimize any downtime through the integrated planning and scheduling of the repairs indicated by predictive monitoring
- Issue alert reports that are easy to translate and provide an early warning of any impending failure
- Maximizing component life by avoiding the conditions that reduce equipment life (for example, by ensuring ongoing precision alignment, minimal lubricant contamination etc.)
- Using condition monitoring techniques to maximize equipment performance and throughput

Cutting Edge PCM in Industry Today

It's probably safe to say that most companies with a significant investment in plant equipment are utilizing some form of monitoring technology to predict some equipment failures. But, it is unlikely that they are achieving optimum results. If predictive condition monitoring is becoming essential to improving a company's bottom line, why isn't it being used universally on all rotating equipment? Until now the cost and difficulty of the technology have been barriers.

Casco Inc. has a substantial investment in pumps and rotating equipment. Since their founding almost 150 years ago, they are consistently looking to improve the effectiveness of plant operations by effectively controlling their maintenance costs. From very modest beginnings, Casco has grown to become the largest corn processor in Canada, with a global customer base. Their primary product is high fructose corn syrup, which is used as a sweetener in a variety of consumer food products such as dairy, carbonated beverages, breads, cakes, and low-calorie products. Other Casco syrups are used in brewing beer and providing functionality to candy and ice cream. They also provide dextrose products used by the pharmaceutical industry as well as starches for varied industrial applications such as adhesives, papermaking, plastics, water filtration and oil

and gas drilling. Their three manufacturing plants run 24/7/365. As such, they can't afford downtime.

Casco looked at predictive condition monitoring in the past but were turned off by both the cost and technology limitations.

The Future is now

New technology continues to be developed that is significantly enhancing the economic return and predictive capabilities of PCM systems. There have been tremendous technological PCM advancements in just a few short years. What was impossible a few years ago is available today. Including:

- Increased intelligence. Vibration and temperature monitoring.
- Wireless operation. Data / Alarm transmission.
- Self powered to save on wiring costs.
- Simpler Reporting. Decreased reliance on expertise to interpret the results.
- Doing More with Less. Consolidation and down sizing has created more multi-site responsibilities.

Today, predictive condition monitoring is available at a cost that can provide near term return on investment. Operations personnel are able to use predictive monitoring techniques to highlight potential equipment problems and a maintenance staff can use predictive monitoring techniques to check the quality of their own repairs (for example shaft alignments, impeller balancing etc.). Soon, there will be reduced focus on using predictive monitoring techniques to predict equipment failure, and an increased focus on using these techniques to extend equipment service life.

The concept of remote predictive monitoring is simple enough, and the capacity to carry it out exists. Today's state-of-the-art predictive monitoring systems can detect an alarm condition and automatically contact — via pager, phone, and e-mail— the appropriate people.

This enables plant personnel to monitor critical equipment in the most unwelcome environments, so you never have unwelcome surprises. Whether you are the maintenance manager with multiple site responsibility or a contractor, your predictive monitoring systems keep you tuned into your plant equipment. As for the interrupted vacation, don't worry. The predictive monitoring system will head-off many "vacation emergencies."

When Casco revisited the possibility of utilizing predictive condition monitoring as part of their plant asset improvement program, they found a major advancement has been achieved by ITT Industries in the predictive monitoring arena.



PROsmart Data Monitor installed on a 3196 MTX pump.

New Breakthrough Technology

PROsmart™ from ITT Industries encompasses state-of-the-art, patented technology in its predictive monitoring system. It provides a cost-effective solution to maintaining uptime on all rotating equipment. PROsmart continuously monitors, analyzes (to pre-stated parameters) and annunciates an alarm when critical criteria are not met. By identifying and diagnosing equipment problems before they have a chance to manifest into unexpected downtime or catastrophic failure, operational costs are dramatically reduced.

PROsmart is powered by locally available power (or a self-powered option is available), that works 24/7 with alarm and alert capabilities. Individual computer formulas (algorithms) have been created based on testing. These are used as the basis for evaluation and are stored on the PROsmart central computer. PROsmart continually monitors for changes in bearing vibration, temperature, speed, cavitation, etc. The monitored information is fed via wireless transmitter through a protected Wide Area Network to PROsmart's central computing server where the data is analyzed and compared to the diagnostic rules based program for that particular piece of equipment. Failures can be predicted based on the analyzed information.

Alerts are sent when problems are detected. Problems might include abnormal flow – high, low, or shut-off; With flow shut-off; the resulting dry running can cause extensive damage to the pump. Bearing distress is detected by the rates of change in vibration and temperature levels. Early bearing fault technology is patented. Another patented technology is early cavitation detection.

Alarms are sent when preset parameters are exceeded. These conditions can include either High Vibration, High Temperature, High/Low Oil Level, Seal Leakage, or Seal Flush Stoppage.

Reports are easy to understand and are issued on all equipment. They can be compared on a period to period (hourly, daily, weekly, etc.) basis.



Pumps not monitored by PROsmart still require periodic visual inspections.

Unique PROsmart features

- Continuous 24/7 monitoring – Catch potential problems before they become catastrophic
- Wireless communications – minimizes system costs
- Generates its own power supply – no wiring costs, a real solution to remotely located equipment.
- Has built-in vibration, temperature, oil level, cavitation, seal leak detection capability, all in one device
- Provides immediate alarms at the equipment location and alerts management via cell phone message, computer and/or DCS
- Condition Monitoring and Analysis program automatically generates alarm and trend reports
- Reports are accessible at all times from any location via a password protected homepage
- Reduces costs for software, hardware, training and maintenance

Casco is presently using PROsmart on six pumps in three different areas of the plant. Results to-date have been excellent. The fact that we can go on-line at any time to check readings is a real plus. And, it's delivered peace of mind to both our maintenance and operations people.

It's Time to Catch-up With the Future, Today

The current way of checking equipment is both obsolete and costly. What's more, it is time consuming, unreliable and reactive rather than proactive. Acceptance and installation of predictive monitoring technology now rather than later will improve your plant efficiency while saving substantial dollars in operational costs. Good management, just as good maintenance practices, is proactive, not reactive. There are many operational benefits of adding predictive monitoring to a facility's uptime strategy. With the competitive environment that exists in today's global economy, preventive monitoring will become a business requirement. ■

Tech Talk

Merging Two Technologies – Medium Consistency Pumping and PumpSmart Control

By Michael Day, Product Manager

Two examples of this merger in the Pulp & Paper Industry are located in the northeast US and the southeast US.

One installation involves one Model 3500 Medium Consistency Pump feeding an Oxygen Delignification reactor which typically has a Total Dynamic Head requirement of 400 to 550 feet. A second Model 3500 unit at this location pumps to a HD Storage tower. The TDH requirement was approximately 275 feet for this service. The TDH variation on these units made it difficult to use a common pump size for both services with a constant speed drive.

Reasons which lead to the selection of the PS200 PumpSmart drive for both medium consistency pump applications include:

1. One pump size for two applications. One application had a significantly lower TDH requirement than the other. For a constant speed drive application this would have required two different pump sizes with one being of lower efficiency and impacting the motor size by one size (200 HP vs. 250 HP).
2. One application required a speed range of 1500 RPM to 1800 RPM. The other required a speed range from 1800 to 2200 RPM.
3. Use of maximum diameter impeller for both services.
4. Allowed for one identical back pull out assembly to be available for both units.
5. Utilization of one pump size and one set of component parts allowed a reduction in the total cost of ownership.
6. Protection features to protect the motor and drive from overload conditions during operation on water or during start up and shut down sequences. Operation on water yields a drastically reduced head requirement and the pump could speed up to the maximum RPM setting and operate far out on the end of the curve. This produced a situation with severe motor amp load, sometimes two or three times full load amp levels. Setting a maximum amp limit protected the motor and drive from failure. Similar conditions could occur during shut down and start up sequences when only water of very low pulp consistency is being handled by the pump.
7. The Model 3500 pumps in these examples are on level control and the rapid response to a change in level from the set point

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