

Process industry cuts pump maintenance to zero

A case study from Emotron





The Emotron M20 shaft power monitors replace costly and service-demanding sensors. No extra cabling is required, nor do any holes need to be made in pipes. The result is reduced installation and maintenance costs, as well as increased reliability.

Process industries can make great savings by preventing equipment failure and production interruptions. This was the experience of ISP Chemicals Inc. After installing Emotron M20 shaft power monitors, the annual maintenance and downtime costs for three of its pumps were reduced considerably – from \$90,000 to zero. The return on investment was immediate.

Leading specialty chemicals producer

International Specialty Products Chemicals Inc. (ISP) serves the pharmaceutical, beverage and personal care industries as the single largest privately-owned specialty chemicals manufacturer in the United States. The ISP Calvert City facility in Kentucky, built in 1956, is the largest of the company's seven American manufacturing plants, with over 500 employees producing 325 different chemicals.

Monitoring technologies failed

In order to reduce productivity losses caused by process equipment failure, the plant has tried a number of monitoring technologies for its pumping systems. Temperature sensors were installed at the bearings and in the casing of the magnetic drive pumps. Flow switches were installed in an attempt to stop dry running or no flow conditions.

“Both devices proved unreliable in preventing premature failure due to the lack of response under low load conditions,” according to reliability engineer Ken Myers.

Another technology sometimes used is current monitoring, but this often fails to detect underload conditions on

AC induction motors. Motor current barely changes until the motor load reaches or exceeds 65 to 70 per cent of its rated power, and even after this point it is non-linear. This makes it difficult to establish protection for the pump.

Emotron M20 eliminated maintenance

In 2000, ISP's local pump supplier, BRI Inc., introduced ISP to the Emotron M20 shaft power monitor.

“Initially our main goal was to protect our magnetic drive pumps from dry run conditions that proved detrimental to the pump operation,” says Ken Myers. “Prior to installing the Emotron M20 monitors, we had three particular pumps involved in significant issues that averaged greater than \$90,000 per year in maintenance and downtime costs. After the monitors were installed, the average costs for the next years dropped to zero.”

High reliability and low-cost installation

The Emotron M20 monitor offers several unique features appreciated by the ISP maintenance team. A unique shaft power calculation technique immediately detects pump load changes due to dry running or other abnormal process conditions, across the whole motor load range. This offers highly reliable monitoring with direct correlation to the pump curve.

Since the Emotron M20 uses the drive motor as a sensor, there is no need for costly and service-demanding external sensors or extra cabling. The result is reduced installation and maintenance costs, as well as increased



Emotron M20 monitors protect progressive cavity pumps (on the left) and magnetic drive centrifugal pumps used in the ISP Calvert City chemical plant.

reliability. An auto-set feature allows four protection set points to be established in three seconds with the push of a single button.

Immediate return on investment

When assessing reliability solutions, ISP looks for investments with a short payback period.

“We saw an immediate return on investment with the Emotron M20 solution,” states Ken Myers. “From our experience, we expect to see the investment pay for itself in just one week in most cases.”

The plant actively continues to pursue new applications for the shaft power monitor on its process pumps. This is done with regard to monitoring reliability, range of capability, ease of installation, and user-friendly set-up.

“Some other equipment problems we encountered came to our attention, such as overload protection, underload

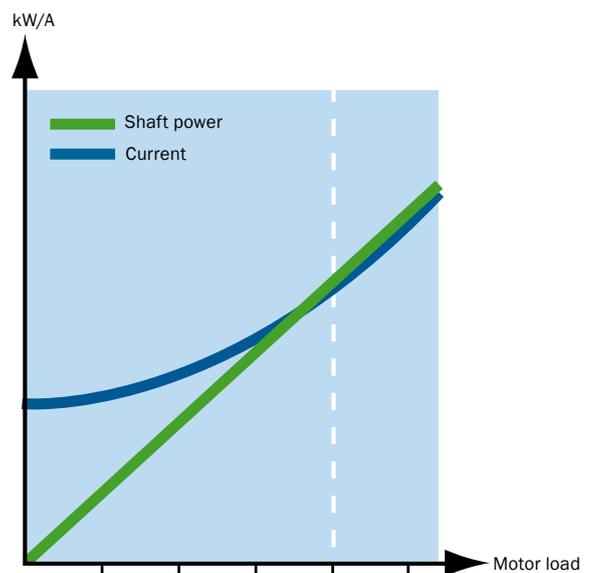


The ISP Calvert City maintenance personnel are pleased with the Emotron M20 solution. The team includes (from left to right) instrument/electrical planner Paul Moss and reliability engineers Ken Myers and Ryan Brown.

situations, troubleshooting, efficiency verification, and failure mode identification,” says Ken Myers. “This led us to install Emotron M20 units on other applications, such as positive displacement pumps, transfer elevators and conveyors, and product blenders.”

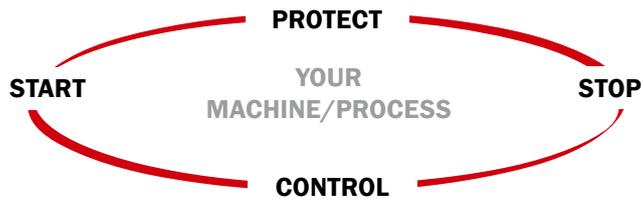


The unique auto-set feature of the Emotron M20 monitor establishes four protection set points in three seconds with just the push of a button.



The Emotron M20’s unique shaft power monitor calculation function gives more reliable supervision than current measurement, which is a non-linear technique and is sufficient only at high motor loads.

A dedicated product portfolio



Emotron's product portfolio meets all levels of need for machines and processes driven by electrical motors. You will always find the optimum solution for your specific situation. When choosing Emotron, you will also benefit from cost-efficient installation and commissioning through built-in functionality that is

otherwise provided by additional equipment. You will also find intuitive user and process interfaces with the possibility of communicating critical parameters to other parts of your process, using analogue, digital, serial or fieldbus communication.



PROTECT

Emotron Shaft Power Monitors

when you wish to protect your application from over- and underload situations

START • PROTECT • STOP



Emotron Softstarters

when you wish to protect your application from over- and underload situations, as well as to optimize the start and stop sequences of your application

START • PROTECT • CONTROL • STOP



Emotron Variable Speed Drives Emotron Compact Drives

when you wish to protect your application from over- and underload situations, optimize the start and stop sequences of your application, as well as be in full control of your process values – flow, pressure, speed, torque, etc.



Dedicated drive

Emotron focuses on solutions for starting, protecting, controlling and stopping machines and processes driven by electric motors. Our drive is to create measurable benefits for our customers and their customers to achieve their and our business goals, thus creating a win-win relationship for all parties involved with Emotron.

We have been developing our product portfolio during over 30 years towards carefully selected applications.

As a result we have built up specialist competence and can therefore offer our customers the optimum solution for their specific application needs.

Emotron is a Swedish company with manufacturing and development resources in Helsingborg, Sweden and in Bladel, the Netherlands. We have sales and service organisations in Sweden, Benelux and Germany, offices in China and Latin America, as well as a global network of distributors and service partners.



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