FEEL THE PULSE

Cut through the complexity of machinery analysis by adopting a simple solution that can see data on your mobile device.

Many plants are required to have protection systems on their critical assets. But having prediction capabilities makes sense too because "it costs approximately 50 per cent more to repair a failed asset than if the problem had been addressed prior to failure," claims the U.S. National Response Center in a recent study. If you want prediction data to monitor start-up and coast down of critical turbomachinery, you may not be able to easily get that from your existing protection system. And adding a prediction system would require a sizable investment. Even then you may not have easy access to view the data.

Emerson's new CSI 6500 ATG protection system embeds prediction data into a standalone protection solution that allows users to introduce prediction monitoring of critical assets without adding a secondary prediction system. This is accomplished through the use of multi-functional cards that can be set up in the field for a wide range of protection measurements and include embedded prediction capability.

"This CSI 6500 ATG has better capabilities right out-of-the-box, especially for measurements relating to gearboxes and rolling-element bearings, using Emerson's exclusive PeakVue technology" says Hermann-Josef Rehnen, Reliability Solutions Product Line Manager for Emerson.

PeakVue technology cuts through the complexity of machinery analysis to provide a simple, reliable indication of equipment health. It works through a single trend that filters out traditional vibration signals to focus exclusively on impacting. This focus provides a much better indicator of overall asset health on pumps, motors, or other types of rolling-element bearing machine.

"Also the built-in predictive functionalities offer up to eight custom filters for use with hydro applications," Rehnen adds. "And the API 670-compliant 19" rack-based system fits into a standard cabinet in the control room or can be used in demanding field environments where Class 1 Division 2/ATEX Zone 2 approvals are required."

The following case histories show how using prediction technology made a difference in the reliability and maintenance expenditures.

Plant Requirements

At a gas production facility, premature bearing failures were occurring on electric motors due to lubrication issues. The facility has 1,600 electric motors, which had different lubrication intervals and amounts. Arbitrary lubrication amounts didn't address specific bearing needs and resulted in some bearings being over-lubricated and others not to get enough lubricant. Implementation of PeakVue technology in conjunction with lubrication allowed each bearing to receive exactly the amount of lubrication it needed and enormously reduced the motor bearing failures.

"PeakVue spectrum analysis of bearing impacting enabled us to differentiate between lack of lubrication and defective bearings," said one of the company's condition monitoring engineers. This saved them maintenance costs, extended bearing life, and prevented unexpected breakdowns because plant personnel were able to see high frequency impacting faults, from metal to metal contact within gears and/or rolling-element bearings long before there was any significant increase in overall vibration allowing them to attempt corrective lubrication or plan a bearing replacement.

CSI 6500 ATG View delivers asset health information to the user anywhere on the plant network. Scan a quick response code (QRC) located on the cabinet and data from the associated rack is viewable on the device screen.

Turbine-Driven Pump Uptime

Emerson's PeakVue technology detected a faulty bearing at a two-train ammonia urea fertilizer manufacturing facility, preventing a catastrophic turbine-driven pump breakdown.

Two turbine-driven pumps, which are critically important to provide steam to maintain fertilizer production, had a history of bearing problems. Even though casing vibration checks were done twice monthly, and proximity and RTD monitoring were done online, the plant's maintenance personnel were never able to detect emerging problems. The failures happened every year or two, resulting in damage to the shaft journal/bearing area.

During the last failure, a turbine rotor was damaged to the point where it had to be removed from service, resulting in loss of the boiler and substantial production losses. This existing plant vibration data collection system was unable to assess high frequency stress wave data and as a result did not recognize the warning signs of imminent bearing failure.

By implementing a protection system with embedded PeakVue technology the fertilizer plant caught impending failure before it caused unplanned production losses resulting in improved plant uptime and overall reliability.

Fast Reaction Time

With the CSI 6500 ATG the reliability professional can react to problems earlier leading to planned, instead of reactive, maintenance. The technology can be networked over Ethernet and/or a wireless router to deliver asset health information to authorized users through a PC or phone application anywhere in the plant's WiFi network. This will enable the reliability professional to monitor the overall health of his system. In addition, the CSI 6500 ATG offers easy integration with third-party systems, because it is the first protection system to include a secure embedded OPC UA server.

This article was submitted by Emerson. For more information, please visit: www.emersonprocess.com/csi.