Five key benefits of improving operations with modern wireless vibration monitoring

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As many manufacturing organisations today move toward wireless monitoring technology, they have more choices than ever before. Users have found tremendous savings through monitoring technology and yet have had to guard against drowning in data or merely looking at the big picture rather than details. Either condition has meant potentially overlooking issues that can cause shutdowns.

RECENT EVOLUTIONS IN VIBRATION MONITORING technology will bring users beyond their previous successes and assist with data digestion through organised and understandable views of conditions. With new technology in hand, users can now more easily find and address the root causes of machinery issues.

It is important to bear in mind clear guidelines while matching personnel abilities and available time to the newly evolved wireless monitoring technologies. Manufacturers around the globe who are choosing wireless monitoring technology have found success by focusing on key elements such as improved safety, cost of implementation, decision-making support, intuitive operation, and overall return on investment.

Improved Safety

Monitoring for vibration in field equipment is critical because it can signal bearing wear, poor lubrication, and more – precursors to hazardous conditions. But because safety is the number-one priority in manufacturing facilities, it is out of the question to send personnel for route-based monitoring into areas where a potential safety situation may arise. However, monitoring must continue.

Recently at a UK processing plant, vibration on an asset indicated impending failure. Rather than expose personnel to risk by performing manual vibration readings, the facility chose to implement a wireless vibration monitoring solution. Not only did the technology enable technicians to make fewer visits to a potentially hazardous site, the monitor increased visibility to the condition before it posed additional risks. Data was delivered remotely away from the risk to personnel and the facility team obtained enough data to trend and find solutions.

Evolving with the technology, this company could continue to improve their solution by shifting to a technology that enables them to move the vibration monitor to different assets for temporary monitoring. In addition, they could install a wireless device – such as Emerson's AMS Asset Monitor – that could monitor up to 12 assets simultaneously. When fewer devices are required to monitor more assets, the team needs fewer trips to the field and gains better visibility.

Cost of Implementation

Cabling and equipment costs can prohibit continuous, hard-wired online vibration monitoring. In these cases, organisations have typically substituted manual measurements taken via handheld units. But quite often, manual readings do not enable the organisation to attain adequate analysis and trending because the manual readings require time and expertise. In addition, to achieve the most accurate picture of conditions, a facility might need a greater variety of sensor input options such as accelerometer placements.

One power producer moved to a wireless solution that was versatile enough in its configuration and installation to deliver savings during implementation. The organisation needed to monitor a motor housed in a gas turbine auxiliary compartment where a cabled monitor would not be cost effective. Because the compartment acted as a Faraday cage, they needed easy, robust wireless connectivity. In addition, they wanted to measure other rotating equipment as required without overextending maintenance personnel.

The solution they found included wireless transmission and no need for expensive cabling. It also included a wireless vibration transmitter that instantly connected to their network with no additional wireless infrastructure, such as a repeater. The transmitter and connected sensors could be moved as needed and the accelerometer configuration was flexible enough to be easily adapted to the situation.

By embracing the next generation of wireless vibration monitoring – for example Emerson's AMS Wireless Vibration Monitor – the ease and speed in which the power producer could implement monitoring of additional equipment could be increased greatly. With a standalone device, which includes both transmitter and sensor, installation and configuration becomes extremely easy. These devices, which can be preconfigured or configured onsite using a wireless gateway or handheld device, enable the company to place at any location in the facility immediately without needing to install and connect separate sensors to the transmitter. This gives almost instant access to readings and complete visibility of the health of that equipment.In addition, a longer battery life and field-replaceable batteries means

the user can plan for less maintenance and fewer trips to the asset being monitored. All these capabilities mean faster deployment, less engineering, and quicker return on investment.

Decision-Making Support

Effective decision making relies on many factors. For example, if operators receive unfocused alerts or alerts presented in a confusing format, they can become distracted. To remain focused on the correct problems and find ways to solve them, personnel should have effective tools such as online vibration monitoring.

Online vibration monitoring can help predict when a failure will occur and alert maintenance to prevent unexpected shutdown. When personnel receive alerts via wireless, they can more simply make the right decisions because they have the information at their fingertips.

In addition, wireless technology is an enabler to help focus personnel's attention on the most important tasks to enable efficiency. Solutions have offered alerts delivered as intuitive health values that many plant personnel can quickly interpret.

As users evolve with the wireless vibration monitoring technology, they will be able to receive alerts and interpret great amounts of data from a variety of platforms. In fact, the latest monitoring advances make it possible for users, through Emerson's PeakVue™ Plus analytics, to immediately determine the root cause of the defect on a given machine. This power can provide them a more sophisticated look at asset health, including overall values, analysis parameter trends, spectrums, and waveforms.

Intuitive Operation

Without intuitive operation, vibration monitors might provide data without follow-up from the facility team – ease of use is key for follow-up action. Recently, another UK end user needed their operators to have information available easily and quickly, so they chose to implement a solution where vibration data was transmitted directly from equipment to the control system.

More than simply data, their solution involved an intuitive health score through Emerson's PeakVue technology. The data could be trended to determine when the equipment was going to fail. This solution enabled improvement of maintenance scheduling while avoided taking equipment offline when failure was not imminent. And because the information was continuous and always available, personnel did not need to wait for collection or its subsequent analysis.

EVOLUTIONS IN VIBRATION MONITORING HAVE PROVIDED AN ALTERNATIVE TO ROUTE-BASED AND CONTINUOUS MONITORING USING HARD-WIRED DEVICES.

As wireless vibration monitoring evolves, the users of PeakVue technology can choose monitoring devices that are supported through embedded prescriptive analytics powered by technology such as PeakVue Plus. The embedded intelligence enables teams quickly and easily to differentiate between mechanical problems – such as rolling element bearing defects – and root-cause issues such as insufficient lubrication.

Return on Investment

Assets that are monitored using wireless vibration can significantly impact the plant. Facilities find that they incur reduced impact when make repairs are made during scheduled rather than unscheduled downtime. Return on investment is often found by avoiding total asset failure, which can often cause irreparable damage and requires costly replacements of entire assets.

A recent case proved the point at a power company that relied on a primary motor for continued operation. A shut down for a total overhaul would have reduced output capacity by 200MW and cost as much as £50,000 in lost revenue. Using a wireless vibration transmitter, the facility optimised their time and fixed the motor when market conditions minimised financial impact, and ran throughout the interim with wireless vibration monitoring continuing through the overhaul. The data that was sent to the control system in that interval freed up maintenance to do other jobs and keep their maintenance schedule.

The next step for the company could be to choose a wireless monitor that can be immediately placed on the equipment to be monitored without the need for any wiring. This less complicated and less costly solution helps to speeds the return on investment for the user.

Conclusion

In general, evolutions in vibration monitoring have provided a true alternative to route-based and continuous monitoring using hard-wired devices. Users now can choose a solution that provides the raw data for deep-diving in tandem with the prescriptive analytics and tools to diagnose the underlying problems. Wireless has built a foundation for strong benefits discussed here and has expanded so much in recent years that users can take those benefits to new heights by updating and expanding their wireless technology. ■