Digital Transformation of Manual Vibration Sampling

Sushi Sensor Solutions – XS770A Vibration Sensor

Challenges

Before the introduction of industrial instrumentation, manual sampling and recording of data were commonplace. As the industry moved to advanced process control, real-time data became critical for accurate decision-making. That resulted in the replacement of most manual sampling by instrumentation. However, vibration monitoring remains one of the few measurements that still relies heavily on manual sampling, especially for equipment considered “non-mission critical.”

Among the disadvantages of manual sampling for vibration monitoring are the following:

1. **Sampling frequency**
2. **Efficiency and safety**
3. **Skilled labor availability**
4. **Analysis and action**

Today, an operator walks through the plant infrequently, collecting data manually

1. Sampling Frequency

Manual sampling is infrequent. It is physically impractical to take regular samples of vibration data by a manual patrol. Manual sampling means plants may only measure vibration once per day or even less often. Vibration problems do not usually progress dramatically in a short time, but they do so rapidly as a device approaches failure. With manual sampling, the human eye can miss this progression, leading to an unplanned shutdown of the process or entire plant. That can be very costly.

2. Efficiency and Safety

The operator who is spending time in the field taking the manual samples can be reassigned to higher value, more critical tasks that will ultimately improve plant performance. Additionally, due to temperature, noise, or atmosphere, many plants have hazardous environments and restricted areas. Removing operators from such conditions makes their work much safer. Finally, manually recorded data can become damaged, lost, or incorrectly recorded. Automating the data collection process digitizes the information, keeping it safe, secure, and ready for analysis.

3. Skilled Labor Availability

Processing plants are operating with less labor now than ever before. Using an already bare-bones workforce for manual sampling means that vibration monitoring is often delayed or skipped, in favor of more pressing tasks. Rotating equipment, such as fans, pumps, and motors should have vibration levels monitored regularly. Not doing so will eventually lead to unplanned downtime when the equipment fails. Running equipment to failure can and should be avoided with an asset monitoring and notification solution.

4. Analysis and Action

Assuming sufficient manual operator rounds and vibration measurements are captured, how is this manual data recorded and analyzed? How is it determined that action should be taken and who makes this decision? Manual vibration sampling leaves many open questions. A digital vibration sampling system with built-in artificial intelligence (AI) provides the answers for when and where to take action to improve equipment health.

Today, 80% of time is spent collecting data, and 20% taking action on that data. Imagine the possibilities if this ratio were flipped!

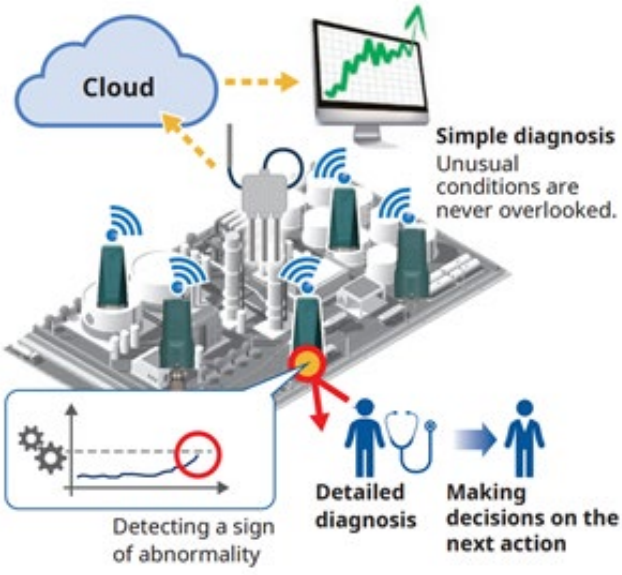
Solution

Wireless vibration monitoring provides a fast, simple, and cost-effective upgrade from manual and irregular sampling.

Yokogawa's Sushi Sensor solution continuously monitors equipment vibration levels (other measurement types are also available). Data is accumulated automatically and sent to a Cloud-based or on-premise system to store and analyze the data.

Meaningful dashboards arm plant personnel with vital information to make informed decisions regarding equipment maintenance. Artificial intelligence and machine learning (AI/ML) can combat limitations in the number and skill sets of the workforce. The AI/ML algorithms can predict future issues in plant equipment, automatically notify the appropriate personnel, and help rank the criticality of issues. This enables maintenance teams to plan scheduled downtime to conduct repairs instead of reacting to unplanned emergency shutdowns, which are far more costly.

Sushi Sensor solutions enable peace of mind, greater productivity, and healthier equipment.



XS770A – Vibration Sushi Sensor*

*Note: Pressure and Temperature sensors are also available.

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