

**Rotating Machinery Condition Monitoring System** 

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## Maximize production efficiency, while maintaining plant safety using vibration analysis and diagnostics on your rotating equipment. Rotating machinery is the heart of most plants. The vibration data contains valuable information. As a sensor manufacturer, SHINKAWA Electric focused on rotating equipment for many years, giving us valuable experience. The sensor information provides early detection of abnormal behavior, failures and possible causes of occurrence. Alarm levels can be established to help prevent catastrophic failure. All of this information is to maximize operations, while minimizing operating costs associated with running a plant. SHINKAWA's **Condition Monitoring Systems (CMS) help** customers make intelligent decisions to protect their investment in assets while controlling risks, costs, and improving efficiency without negatively impacting production or safety.

# Optimize plant operations, reliability, and productivity

### Reduce downtime with early detection

Failure indicators are based on changes in vibration levels and characteristics. Knowing what is going on, allows for proactive maintenance where downtime can be scheduled minimizing impact to production and profits.

### Optimize production schedule

Production efficiency drives the profitability of a plant. Maintenance of the equipment optimizes time and costs resulting in managing profit risk.



# Allow empirical maintenance knowledge to be passed on

Maintenance professionals have "know-how" or empirical knowledge which is difficult to pass on. Having real life data with analysis helps create the "know-how" so any level of experience can benefit from the data. It is a scientific approach and reduces learning curves.

### Reliable and efficient maintenance

Proper sensor technology with necessary sophistication and precision provide the raw data for accurate analysis and diagnostics. This data allows for intelligent, timely and cost effective maintenance decisions by plant personnel.

### Reduce total maintenance costs by moving from TBM to CBM

TBM is an excellent approach to servicing equipment; however, it is not the most cost efficient. Utilizing CBM is a proactive way to reduce costs, become more efficient, and have better knowledge of the equipment health.

TBM : Time Based Maintenance CBM : Condition Based Maintenance

#### Capture, Analyze, Diagnose

Sensor data is continuously collected for analysis and diagnosis on the equipment.

SHINKAWA's original software is based on our expertise in sensor technology and vibration experience.

Our customers know this and rely on our high quality products.

#### **Sensor Technology**

SHINKAWA's expertise in sensor technology allows us to provide a range of products to fit your needs and monitor various parameters; Vibration, Rotation, Phase Mark, etc.

#### Monitoring

Our monitoring equipment receives the sensor signals, converts to vibration amplitude data, monitors and transmits waveform signals to analysis equipment.

#### **Acquiring Analysis Data**

Vibration waveform data are processed at high speeds, with frequency and phase analysis.

#### **Saving Data / Plotting**

Processed data is saved and analysis/diagnostic results are displayed in user configured graphs.



SHINKAWA has the right sized solutions to fit your equipment size and needs.

# SHINKAWA's CMS options provide customers with flexibility to suit their needs.

24/7 monitoring allows for early abnormality detection. Once the issue is known, you can plan an optimal time to perform required maintenance from overhaul, part replacement to technical updates, resulting a possible reduction of the total expense caused by emergency shutdowns or unpredicted machine failures. SHINKAWA's CMS solutions are "Right size & Right cost" for your critical machines and balance of plant(BOP) equipment, meaning you can get the required CMS solutions with minimized investment. Our CMS solutions help monitor your rotating machinery critical to your plant or process covering the monitoring of operating parameters such as shaft radial vibration, shaft axial position, casing vibration, phase mark, rotating speed, and so on of the machines supported by sleeve bearings or roller bearings.

#### • Distributed Control System (DCS) Enterprise Asset Management (EAM) Manages information on facility/equipment, S-STation maintenance part inventory, failure/replacement Integrated Platform A platform to monitor/analyze machinery in different sites with data from multiple infiSYS and DCS. Flaborating • infiSYS Complete Vibration Analysis and Diagnostic System Analyzes vibration data for its phase mark and Device Server frequency and then plots analysis graphs required Converts data from non-SHINKAWA system for vibration analysis. The display software provides superior user experience with features like drag & infiSYS

#### **■ CMS Configuration**

#### DAQpod Analysis Data Acquisition Unit

For condition monitoring of large rotating machinery by analysing the vibration waveform signals from condition monitors and transferring the analysis result to infiSYS View Station. Accelerationsensors can be connected directly for data collection when used for bearing vibration analysis on small rotating machinery.

#### • Kenjin Portable Vibration Analysis System

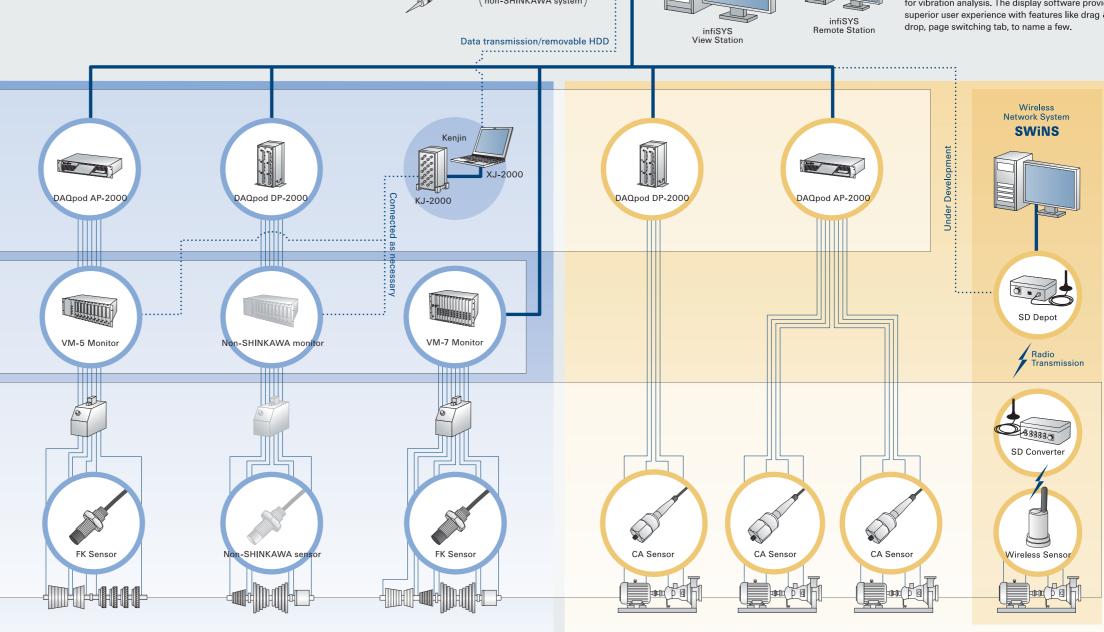
A portable vibration analysis system suitable for on-site equipment monitoring or test.

#### • VM Series Condition Monitors

Continuous monitoring of shaft vibration, phase mark, and rotation speed, etc. with properly set alarm thresholds provides urgency of attention. VM-7 monitor sends analysis date directly info the infiSYS View Station via Ethernet communication.

#### Sensors/transducers

Detect various condition parameters, including shaft vibration, shaft position, phase mark and rotation speed of rotating machinery. FK sensors are suitable for measuring/detecting shaft vibration, shaft position, rotation speed and phase mark of critical/essential equipment. CA sensors are piezo-electric acceleration sensors suitable for detecting vibration of bearings or gearboxes of general purpose equipment. SWINS is a system to wirelessly transmit vibration waveform data collected with wireless acceleration sensor, CA sensor or others. to host system.



#### Main / Essential equipment

(Turbines, power generators, large compressors, IDF, FDF, BFP, CWP)

**General purpose equipment / auxiliaries** 

(Pumps, gears, motors, fans, compressors)

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# SHINKAWA's total support covers development of engineers in succeeding Japanese technology and analysis service.

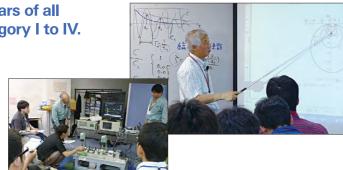
Giving safe, stable operation of customer's plant top priority, we offer not only CMS products but also affluent support to maximize the total experience.

#### Training courses for Machinery Condition Analyst (Vibration) in accordance with ISO 18436-2

SHINKAWA Sensor Technology is the only certified training organization in Japan who can provide seminars of all classifications of Vibration Analyst, from category I to IV.

Management face constant pressure to ensure "safety". Vibration Analysts certified in accordance with ISO 18436-2 has been gaining in popularity.

SHINKAWA Sensor Technology is Japan's only certified training organization to offer all levels of Vibration Analyst Category Training. Our years of experience in vibration monitoring, sensor technology assists customer to meet their growing demands.



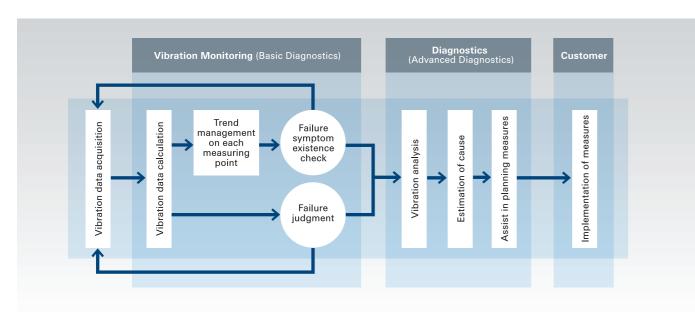
#### **Rotating Machinery Monitoring & Diagnostics Service**

#### Outsourcing service by rotating machinery monitoring/analysis specialists

Monitoring and diagnostics of rotating machinery are essential for prevention of troubles on plant assets, as well as for safe, long-life and efficient operation; however, they require all sorts of measuring instruments, engineering skills and expertise. SHINKAWA provides programs, including periodic measurements, early failure detection, condition

acknowledgement and vibration diagnostic/analysis reports, which leads directly to cost saving of equipment maintenance and management.

Let us help you set higher safety levels on your plant equipment with quality service from our specialists. Let SHINKAWA help you with your needs.

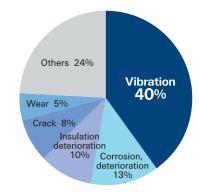


According to Japan Institute of Plant Maintenance, as much as 40% of plant equipment problems result from vibration on rotating equipment.

SHINKAWA's CMS detects failure symptom in early stage with monitoring, analyzing and diagnosing vibration from rotating machinery, estimates the cause to prevent failures/accidents and ultimately contributes to plant's efficient, continuous safe production.

#### **Causes of Troubles in Plants**

Source: Japan Institute of Plant Maintenance Research report on maintenance technology –equipment diagnosis technologyof production plants



**Related Standards** 

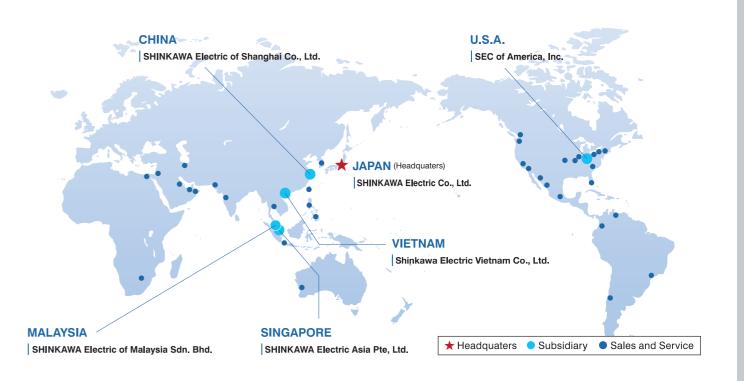
Vibration measurement and evaluation of various rotating machinery are standardized by the International Organization for Standardization (ISO), and the sensors and monitoring systems used for the machinery protection systems by the American Petroleum Institute (API).

ISO 20816 Series: Mechanical vibration – Measurement and evaluation of machine vibration –

API 670 5th Edition: Machinery Protection Systems

#### **The SHINKAWA Network**

SHINKAWA is employing global thinking to create a business with a worldwide network currently comprising over 50 bases around the world.



Please refer to our website to find the information such as addresses and phone numbers of our subsidiaries. URL: https://www.shinkawa.co.jp/eng/