Machinery Reliability Services

Asset Intelligence

You've heard the old saying "knowledge is power." Well, applied knowledge is more powerful. Utilizing Predictive Technologies can provide insight and interpretation into what your equipment is telling you while giving you the chance to manage your assets– not have them manage you.

Machinery Reliability Services

Novaspect local technical expertise coupled with Emerson Reliability Solutions use a full breadth of diagnostic tools, support a diverse industry base, and a wide range of machine types. Novaspect offers several reliability-focused, predictive technology-based services to help your company achieve maximum Operational Certainty.
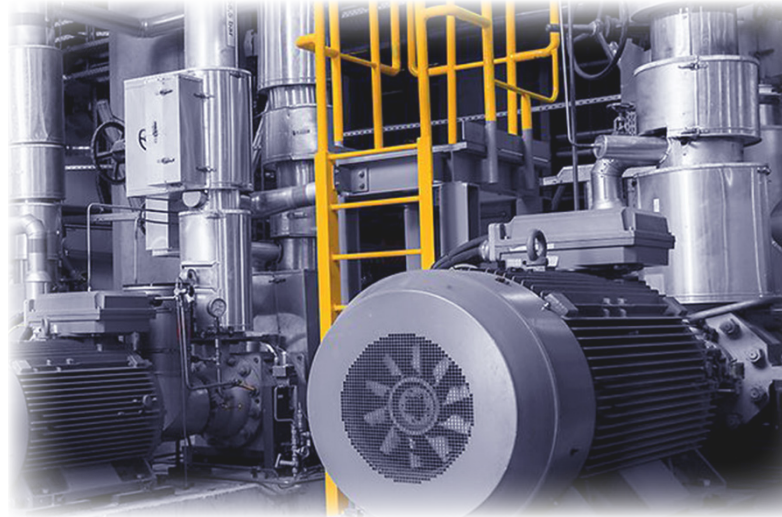
- **Route-Based Services** (Vibration, Electric Motor Diagnostics, IR Thermography, Ultrasound, Oil Analysis)
- **Rotating Machinery Balance & Alignment**
- **Online / Remote Condition Monitoring Systems** (Wired and Wireless)
- **Condition Monitoring Analysis Service**
- **Predictive Maintenance (PdM)** Programs
- **Training & Mentoring Services** (On or Off-Site)

Why use Predictive Technologies?

- **Safety**

With the high speed at which complex industrial processes run, sudden failure may create hazardous conditions. By detecting problems before they become serious, these technologies help avoid potentially dangerous situations or even catastrophic events before they occur.

- **Cost Avoidance**

Inspections using Predictive Technologies detect problems early. Scheduled maintenance provides more time to find the right parts at the right price to get back online quickly. In addition, getting back online quicker means lower labor costs and fewer "critical call outs" from a reactive break/fix mentality. The financial savings can be significant.

- **Uptime**

Unscheduled downtime may cost thousands of dollars per hour. A proactive maintenance department can head off critical failure by scheduling repair during planned outage events, or production changeover times.

- **Quality**

Product quality is dependent on processes that run reliably and consistently. When you identify equipment problems before a failure occurs, impact can be minimized to assure your systems operate optimally while delivering products that meet quality control requirements.

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Field Service

■ Precision Laser Alignment

Misalignment of rotating machinery shafts causes increased machine vibration, bearing and coupling failures, unwanted equipment downtime, and even increased power consumption. Precision laser alignment will correct the misalignment across the coupling or belt sheaves and prevent these problems from developing. Novaspect's highly skilled specialists and technicians can perform Precision Laser Alignment on a wide variety of machine types and sizes, helping you keep your plant reliable, and your machines running smoothly.

■ Rotating Machinery Balancing

Field balancing is a technique used to balance a rotating part in place without removing the part from the machine. An imbalance occurs when the shaft center of mass does not rotate at the center of rotation. A heavy spot on a rotor is accentuated with centrifugal force causing it to rotate off center. The resulting vibration amplitude can be detrimental to equipment and bearing life. Some causes leading to rotor imbalance can be: eccentricity, stress relief distortion, thermal distortion, corrosion, uneven wear, deposit buildup, asymmetrical design, assembly errors, or rotor damage. By performing field balancing without having to remove equipment, time and cost savings can be significant.

Vibration

■ Route Data Collection, Analysis & Reporting

There are several causes of equipment vibration. Identifying the source of vibration through proper vibration analysis allows you to be proactive before damage happens. Regularly scheduled vibration analysis identifies conditions early on and can provide additional time to schedule and plan maintenance activities.

Although vibration occurs normally in any industrial equipment, some types of vibration sources may require more attention as they could result in further issues with the equipment and lead to possible failure, such as:
- Misalignment of couplings, bearings, and gears
- Mass imbalance
- Looseness
- Deterioration of rolling-element bearings
- Wear or rubbing
- Aerodynamic or hydraulic problems in fans, blowers, and pumps
- Resonance

Advanced Vibration Analysis Methods

■ Multi-Channel / Continuous Vibration Monitoring

Portable vibration analyzers are the cornerstone of a successful predictive maintenance program. However, some anomalies, like root cause investigations and machine train evaluations, can surpass the capabilities of even the most sophisticated portable data collector. Novaspect's Machinery Reliability Services

Laser alignment using AMS 2140

Vibration data collection using AMS 2140

*Emerson AMS 2140
Machinery Health Amnalyzer*

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team utilizes the Emerson **AMS 2600** 24-channel Machinery Health Expert to perform optional transient analysis, turbo machinery startup, coast down, production state monitoring, and other complex rotating Equipment Analytics. It can monitor and record all channels continuously and simultaneously for hours, days, or weeks unattended.

■ **Operating Deflection Shape (ODS)**
ODS is a highly detailed motion study to determine root cause(s) of complex vibration issues of a machine, its physical foundation, platform, piping, ductwork, and other variables. Hundreds of frequency, amplitude, and phase measurements are recorded to create a model with true in-service data.

The model is animated at all applicable frequencies around a full three-dimensional view for motion analysis, and videos of important findings are recorded to accompany a full written report of findings and recommended solutions.

Emerson AMS 2600 portable 24-channel Machinery Health Expert

■ **Motion Amplification**
Motion Amplification is a powerful diagnostic tool that allows visual observation and analysis of issues with moving equipment. Faults can be observed specific to a single component such as mounting hardware, cracked welds, lack of rigidity, or resonance conditions in machine support structures and piping. Motion Amplification is driven by proprietary software that turns millions of pixels in today's modern cameras into millions of individual data points. This technology enables the technician to quickly identify and analyze what is invisible to the naked eye and move to root cause problem solving.

ODS model of multi-stage reciprocating gas compressor
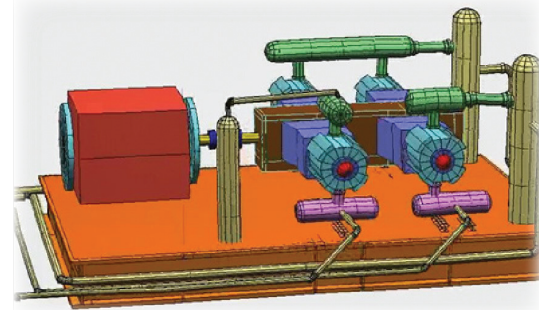
Infrared Thermography
Electrical system failures are frequently preceded by a considerable period of increased heat in the faulty components of the system. If the increase in component heat is detected in time, repairs can be performed before a failure occurs. Infrared thermography is the primary tool that can identify areas of abnormality. These include overloads, loose connections, inductive heating, open circuits, harmonics, unbalanced loads, and defective equipment.

Vibration analysis using motion amplificaton
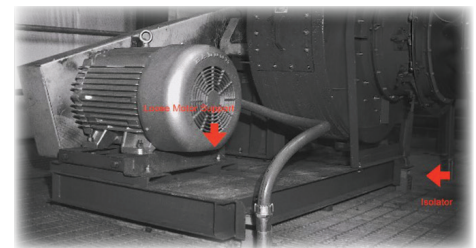
Tribology (Oil Analysis)
Lubricants are the life blood of any machine and oil analysis is an integral part of an effective Preventive Maintenance (PM) and Predictive Maintenance (PdM) program. Novaspect technicians can analyze lubricants, monitor for the presence of contamination, look for indications of machine wear, and ensure the lubricant is fit for continued use.
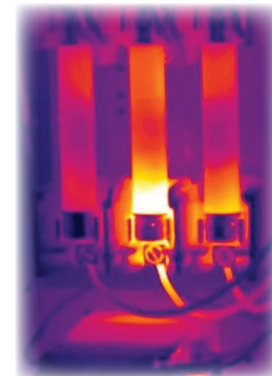

IR imaging of electrical components

Machinery Reliability Services

NOVASPECT
Emerson Impact Partner

EMERSON.

Electric Motor Testing

■ **Motor Circuit Evaluation & Motor Current Signature Analysis**
Motors can be costly and are considered highly critical assets. Some faults in motors are not identified by other predictive testing methods, or may not be detected in time to prevent damage or process interruptions. Other testing methods are needed to assess fault conditions in motors.

Novaspect's Reliability Services team can perform motor testing using the PdMA MCEMAX® Motor Tester. This comprehensive tester monitors all potential fault zones and allows for immediate notification of alarm conditions.

PdMA MCEmax® Motor Tester

Ultrasound Testing

■ **Leak Detection**
Ultrasound leak detection covers a wide range of leaks: pressure, vacuum, or any gas. One of the more popular applications for ultrasound is compressed air leak surveys. Our technicians will identify and mark leak locations and complete a quantitative analysis report that will detail cost reduction from repairing energy-wasting leaks.

■ **Steam Trap Surveys**
When steam traps leak or fail, it can be extremely costly in terms of product quality, safety, and energy loss. Ultrasonic analysis makes it easy to detect these problems and readily determine operating conditions while steam traps are in service.

UE Systems Ultraprobe® 10,000

Reliability/Predictive Program Development

■ **Setup, Training, & Mentoring for All Predictive Technologies**
Do you want to implement a predictive technology program for your facility, but do not know where to start? Is your current predictive program struggling to show effectiveness? Does your current predictive team need some one-on-one mentoring on analysis methods with an advanced level specialist on analysis methods, database building, or optimization? We can help. Novaspect's Reliability Specialists can assist you in building, growing, or improving your own in-house programs. No matter what skill level your team is at, we can customize a program to meet your specific needs.

Please contact us today to discuss how we can help make your operation safer, more reliable, and more profitable.