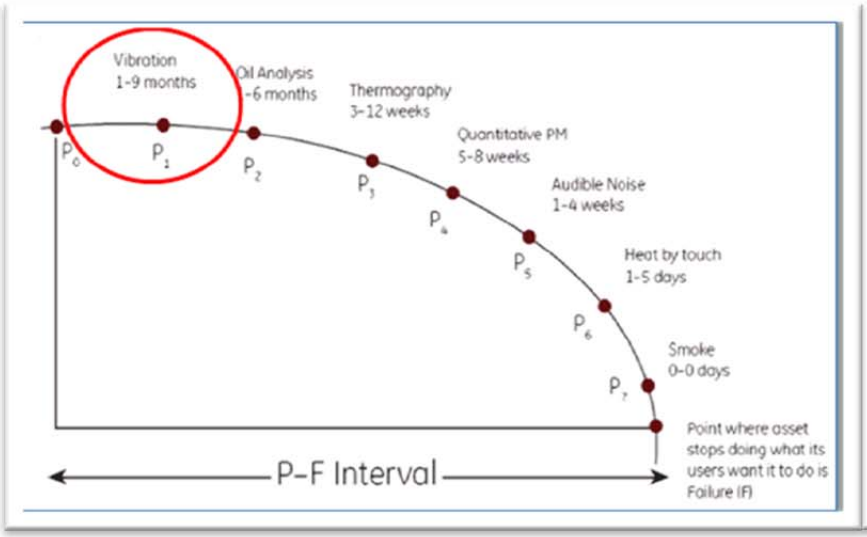
Remote Vibration Analysis



Maintain the peak performance of your rotating machines with Remote Vibration Analysis Service.

- Reduced operations and maintenance costs
- Improved safety, health and environmental compliance
- Improved rotating equipment availability
- Portable, Online and Wireless technologies

Introduction

Many companies waste money through unnecessary equipment breakdowns and performing preventative maintenance on machines that are not broken. Even the most thorough and comprehensive routine maintenance program cannot stop faults from developing in machinery.

Condition monitoring is a critical component in improving the performance of rotating equipment. The P-F curve shows qualitative time relationship between potential failure and functional failure. The further to the left (closer to P0) one can operate for any given asset, the easier it is to plan maintenance and lower the likelihood of surprise functional failures.

Vibration analysis is one of the most successful techniques used for condition monitoring for Rotating Equipment. Vibration analysis is a predictive maintenance method that allows early problem detection in rotating machinery (1 – 9 months). Many companies recognize the benefits of a vibration analysis program, but do not have the skills or resources to have a complete in-house program.

Emerson is a global leader in providing vibration monitoring technology and services to wide range of industries. Using Emerson's Remote Vibration Analysis Service, vibration data is collected on a periodic basis and sent to a team of expert analysts. These experts analyze the data and provide a detailed report including any significant machinery problems identified during this analysis and the recommended actions. With Remote Vibration Analysis, you have the advantage of collecting non-scheduled data on equipment that is suspected of having a problem without having to wait until the next scheduled analysis.

With Emerson's expertise, technologies, and training, you will be able to implement world-class predictive maintenance program for periodic or continuous monitoring of critical assets. Emerson provides portable, online and wireless solutions based on your plants. Remote Vibration Analysis gives you advance warning of faults, so you can reduce downtime and use maintenance resources more effectively.

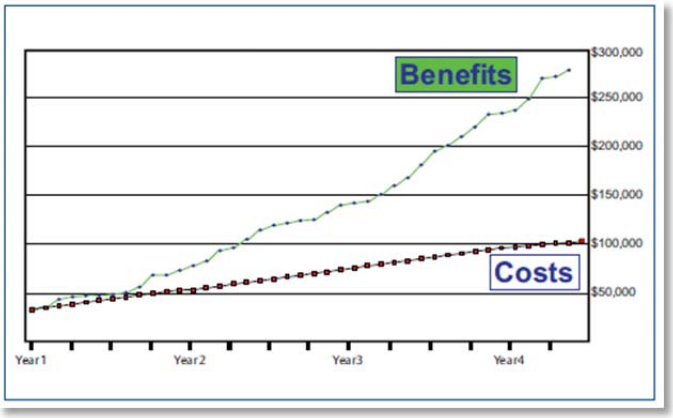
EMERSON
Process Management

Benefits

Reduced operations and maintenance costs: Emerson maintains a team of trained, ISO Category II and above certified professional analysts. The analysis is centralized, consistent and process driven allowing you to focus on corrective action rather than learning analysis technology. No need for the high cost associated with maintaining certified vibration analyst on site.

A CSI 2140 analyzer can be provided as part of the Remote Vibration Analysis contract eliminating the need to purchase equipment. You have the option to purchase the CSI 2140 at a reduced price after 1 year of service. With portable analyzers, you will benefit from:

- Lower cost data collection – portable based
- Lower technology cost – no software to buy
- Lower training costs – Technicians and operators can be easily trained to collect data

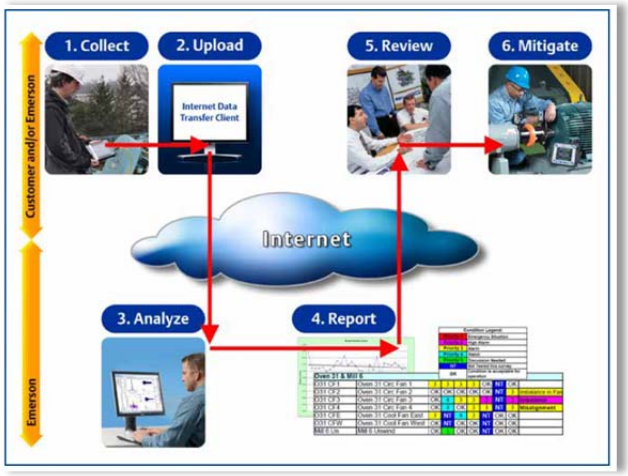


Example of how one customer's cost vs. recognized benefit compared over a 3+ year period

Improved safety, health and environmental compliance: Incorporating Remote Vibration Analysis experts into your existing in-house vibration program increase the effectiveness, flexibility, and responsiveness of the program. That translates into improved equipment reliability and safety in the plant.

Improved rotating equipment availability: Maintaining a high level of machinery health is essential to high performance plant operations. The ROI for any Machinery Health program is directly related to accurate and timely equipment health assessments. Emerson, with field-proven experience, has demonstrated the value of the Remote Vibration Analysis program to many customers with its best-in-class offering.

Service Description



The Remote Vibration Analysis process includes six steps shared between you and Emerson experts.

1. Collect: Any vibration data that can be collected with a CSI 2140, CSI 2130 or CSI 2120 or coming from an online system CSI 6500 can be uploaded and analyzed remotely**.** Collection can be performed by you or by the local Emerson service provider**.**

2. Upload: Using the Emerson provided 'Internet Data Transfer Client', the vibration data is securely uploaded directly from the CSI 2140/CSI 2130/CSI 2120 or the online system CSI 6500 to Emerson's analysts**.**

3. Analyze: Objective is to identify defects before they reach alarm levels allowing time to schedule maintenance and mitigate issues. Waveform and spectrum data are analyzed for machinery issues while DC Gross scans reveal wiring and sensor problems on online systems. Data is compared to previous readings to identify changes and determine if the equipment is deteriorating over time.

4. Report: Analysis experts issue comprehensive reports covering all equipment analyzed including historic health status. The Predictive Maintenance Summary Report details all existing alarms and a description of the alarm. The Predictive Maintenance Detail Report provides the actual spectrum and waveform readings for each alarm as well as a detailed description of the issues found.

5. Review: You are able to quickly review the reports provided for developing problems and determine the appropriate corrective action to take, if any.

6. Mitigate: Corrective and preventative maintenance actions are performed on the equipment based on the recommendations from the review. On-site actions can be performed by you or by the local Emerson service provider

EMERSON
Process Management

Service Deliverables

Customer's Requirements	Committed Deliverables	Optional Deliverables
Number of Assets Vibration Analysis Frequency	Initial Site Visit Initial Route Data setup Periodic Data Analysis Periodic Report Periodic Phone Consultation	Data Collection Portable Analyzer

Ordering Information

To learn more about how Remote Vibration Analysis can improve reliability and safety in your facility, please contact your local Emerson Rep/FSO.

Emerson Process Management
Reliability and Lifecycle Solutions – Machinery Health Management
835 Innovation Drive
Knoxville, TN 37932
T (865) 675-2400
F (865) 218-1401