

Facilities that adopt predictive maintenance practices in addition to traditional preventative maintenance, realize dramatic results\*:

**75% fewer breakdowns**  
**20% energy reduction**  
**45% greater uptime**

\*Data pulled from past vibration testing, results, and analysis

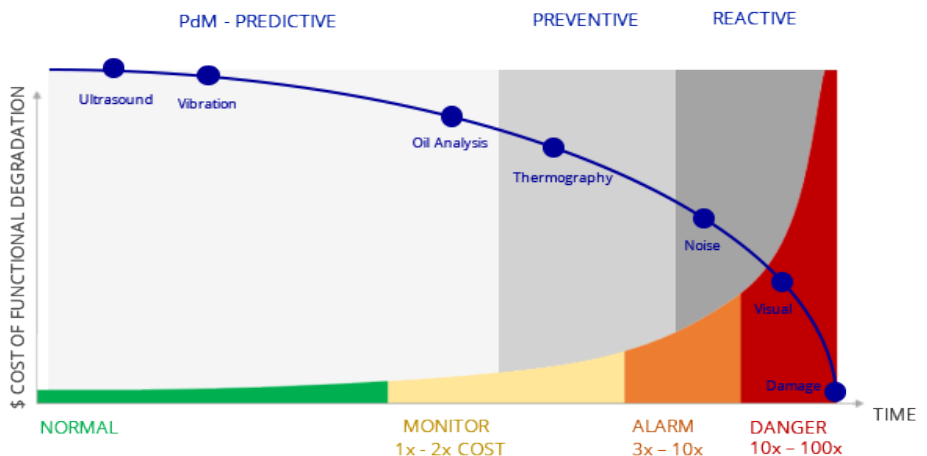


## Predictive Maintenance through Vibration Analysis

### 75% Fewer Equipment Breakdowns & Better System Performance. With Vibration Analysis.\*

The cost associated with equipment malfunctions (parts, labor, downtime, failures) decreases when companies move away from reactive maintenance practices and adopt a combination of preventative and predictive maintenance practices. When companies apply these cost savings across an entire facility, bottom lines generally improve.

EMCOR Services MSI - Mechanical Services' (MSI)'s vibration analysis offering utilizes an equipment database of nearly 100,000 different machines. When comparing to industry thresholds, similar equipment, and the individual history of that machine, we can identify emerging malfunctions as early as possible. This minimizes repair costs and can avoid potential failures and associated downtime.



#### Vibration: The Problem.

We've found that up to 35% of existing equipment has some level of emerging malfunction that would otherwise go unnoticed, so when motors, pumps, bearings, fans, and other similar components vibrate in ways they are not meant to, continuous and uneven wear can occur. This can cause equipment failure and downtime that interrupts operations, causing lost time, money, and productivity to the business.

#### Vibration Analysis: The Solution.

One of the most effective ways to avoid these problems is to implement a vibration

analysis program prior to vibration issues arising. Using today's most advanced vibration analysis technology, EMCOR Services MSI's experts establish a vibration baseline for critical equipment. After doing so, we measure performance regularly, watching for significant baseline deviations.

This allows us to detect problems and identify causes early, so clients can plan ahead and schedule appropriate maintenance procedures when they are most convenient. It's one of the smartest ways to prevent major failures, minimize operational disruptions, and reduce overall business impact of equipment failures.



### Preventive Measures. Predictable Results.

A predictive approach using vibration analysis can help clients avoid:

- » Major repairs and costly replacements that result from extensive machine damage
- » Unnecessary materials waste—because when a breakdown occurs, materials often need to be discarded
- » Damage to other equipment and/or parts caused by improper operation of failing components

- » Higher energy costs that result when efficiency declines and equipment has to compensate by consuming more energy
- » Unnecessary maintenance costs from scheduled maintenance programs that require shutting down equipment and replacing parts that may still be functioning properly

**EMCOR Services MSI - Mechanical Services** offers complete building systems solutions for a wide array of commercial, industrial, healthcare, and other clients. Regardless of the size or complexity of your needs, we design, install, replace, repair, and maintain a full range of heating, ventilation, and air conditioning (HVAC) systems.

In addition to HVAC services, we can also provide installation services for your facility. After your systems have been installed, we provide 24/7/365 scheduled, emergency or project services to minimize downtime and ensure that your systems are always delivering the comfort, efficiency, and productivity you expect.

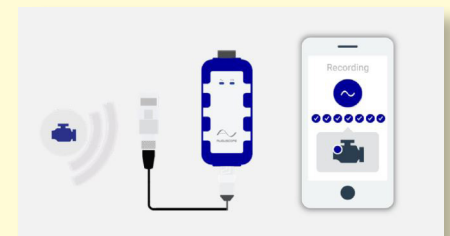


**How Can We Help You? Call us: (407) 857-3510 Visit: [www.msifla.com](http://www.msifla.com)**

### Avoiding Problems. Embracing Innovation Utilizing Today's Technology.

#### Portable Diagnostics:

MSI utilizes a handheld, smartphone-enabled device to collect vibration data from assets.



#### Continuous Diagnostics:

For continuous monitoring on the most critical assets, MSI uses wireless sensors installed on the machine for data collection.



#### Comprehensive Reports:

The innovative technology can detect the slightest changes in a machine's operation and warns clients of developing malfunctions. The data collected allows MSI to perform the analysis in real-time and the results are quickly delivered to clients in PDF reports.

