

Condition Analysis/Predictive Maintenance

Condition Analysis

Predictive Maintenance starts with Condition Analysis. The condition of a machine is analyzed to identify and document any current or developing problems.

Vibration Monitoring

IMPACT Engineering begins most machine condition surveys with vibration detection. Machine vibration is one of the best indicators of the overall condition of any rotating machinery. Machine defects such as misalignment, imbalance, and bearing wear are detected with vibration monitoring and analysis.



Ultrasonic Detection and Analysis

Ultrasonic Detection

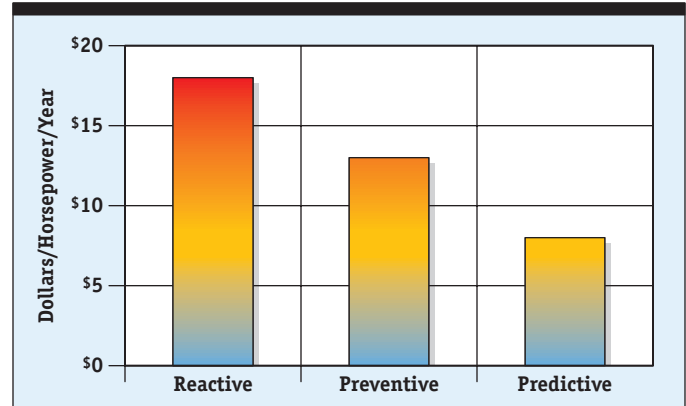
IMPACT Engineering also incorporates ultrasonic bearing and coupling wear/fault detection to identify problems long before vibration increases would indicate a fault is present. Bearing lubrication problems or coupling fault detection by a non-contact probe are other examples where ultrasonic detection is used to detect potential machinery problems.

Lube Oil Analysis

Lube oil analysis, in conjunction with vibration and ultrasonic data, allows IMPACT Engineering to create one of the earliest fault detection models possible. Wear particles, contaminants, degradation, and water content are items analyzed in each lube oil sample.

Thermographic/Infrared Imaging

Infrared imaging is used to detect electrical component "hot spots" that result from overloading, loose connections, or insulation damage. Like most detection methods used by IMPACT Engineering, infrared imaging is performed during normal uninterrupted operation to extend machinery life and promote a more effective electrical preventive maintenance program.



Maintenance Cost per Horsepower for General Rotating Machinery*

Predictive Maintenance (PDM)

Traditionally, two major types of maintenance strategies have been utilized:

- Reactive Maintenance (RM) – *Run until failure.*
- Preventive Maintenance (PM) – *Overhaul at designated time intervals prior to expected failure.*

Predictive Maintenance (PDM) describes a maintenance approach of determining a machine's condition and its need for maintenance without disturbing normal operation.

Predictive Maintenance is accomplished by utilizing vibration analysis, ultrasonic analysis, lubricating oil analysis, thermographic/infrared inspections, plus other condition monitoring techniques for determining operating condition and detecting faults. From trending and diagnostic results of the PDM information, an active approach of systematically finding and eliminating the underlying causes of machine problems can then be initiated.

IMPACT Engineering takes Predictive Maintenance one step further with Total Reliability Management (TRM). This asset management strategy is results-driven to achieve maximum reliability and has been designed for the maintenance industry to minimize initial installation related problems, highlight developing machinery defects, reduce machine downtime, and defer open-and-inspect requirements when justified. Well maintained, reliable operating machinery produces substantial, wide-ranging cost savings as illustrated in the above chart.

*Source: R.J. Hudachek and V.R. Dodd, ASME, "Progress and Payout of a Machinery Surveillance and Diagnostic Program".