

Reliability Analysis: Adding Substantial Value to a Predictive Maintenance Partnership

Ensuring Reliability through Predictive Maintenance

If a manufacturing or processing business is to be successful, the reliability of the equipment it depends upon must not be taken for granted. A failure of just one machine integral to a production process can result in significant losses in terms of repair costs, downtime and throughput, and thus it is crucial for operators to take steps to foresee breakdowns or inefficiencies whenever possible. For this reason, many companies have turned to *predictive maintenance (PdM)* partners to detect potential issues and determine solutions before emergency situations ever occur, allowing for more effective planning.

Predictive Service, like other PdM companies, uses special measuring devices to analyze the health and functionality of every component of a specific piece of critical machinery, giving early warning of pending failure and providing long-term assessment of equipment condition to help customers plan for maintenance and avoid downtime during normal production hours. When we analyze a piece of equipment, we utilize methods such as vibration analysis, infrared inspection, oil analysis and sensory inspections to determine what risk factors exist for that specific unit. For example, we may find flaws are developing in a rolling element bearing that will eventually fail, and will notify the equipment owner to allow for repairs or replacement to be scheduled conveniently, not during an emergency.

Beyond offering savings by greatly reducing the likelihood of in-service equipment failure, PdM is helpful in avoiding unnecessary costs related to premature maintenance on functional machinery. By determining when maintenance is truly needed based on the condition of equipment instead of adhering to a generic, calendar-based maintenance program, machine downtime is avoided and service costs are minimized. Additionally, servicing a piece of equipment only when necessary reduces the likelihood of issues occurring as a result of human error during service-related interactions with machinery.

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Multi-site Consumer Products Company - example							
Year	Problems Found						
	Sites	Assets Inspected	IR	VIB	Visual	Oil	Problem %
2008	69	10688	282	605	361	0	9%
2009	79	10780	224	567	171	12	7%
2010	79	11586	122	327	33	7	3%
2011	57	9654	71	138	25	4	2%
Total			699	1637	590	23	

Predictive maintenance is of definite value for helping companies avoid costly problems with their equipment, but it often results in a temporary solution to a problem. The PdM process can be cyclical if potential issues are only identified and fixed for the moment. Sometimes the root cause of equipment problem is not addressed as part of the PdM process, resulting in future of redundant issues. While a substantial amount of money is still being saved through the PdM engagements when compared to an instance where equipment failure actually occurs, there is still opportunity for more extensive savings if root causes of problems are investigated and long-term solutions are implemented based on well-supported findings.

The Next Step: Increasing Reliability

It is here that the idea of *reliability analysis* and subsequent consulting comes into play. Every time a PdM company analyzes equipment, they have an opportunity to record what risk factors were detected, how often, and how expediently problems must be addressed based on potential severity. By tracking historical data for every piece of equipment analyzed, it becomes possible to determine trends in the equipment's behavior and devise strategize to address recurring problems as a result.

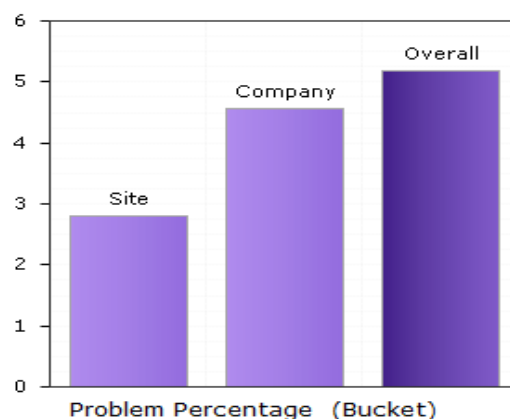


Figure One – Percent problems found benchmark for equipment classes

For instance, if a belt drive used to turn a part within a machine is a cause of increased vibration levels, a predictive service company using vibration analysis techniques may be able to isolate the problem and determine the recommended corrective action. If this finding is recorded reliably within a database (see figure two), it becomes possible to look back at the history of the machine and determine whether there are repeat issues with belts, or whether it is simply one of a variety of issues experience over time with that unit. In the event that it is determined that there is a history of belt issues across all machines, an opportunity presents itself to go beyond simply suggesting replacement of the belt—the PdM company can choose to also ask the obvious question: “Why?”

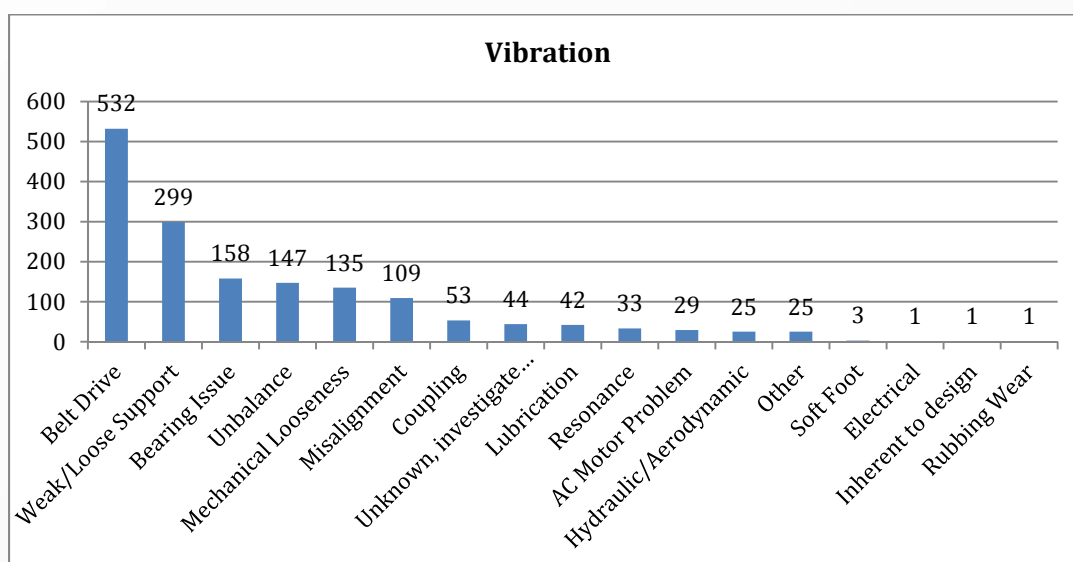


Figure Two – Vibration program failure mode review over three years

It is at this point that a company moves beyond simply providing PdM services to become a true reliability partner. No longer concerned with dealing in the “here and now” and only identifying potential issues, a reliability partner looks to the future by consulting recorded data and positing why failures or potential failures are happening. The service provider can then collaborate with a customer to determine what steps can be taken to avoid the need for maintenance and parts replacement in the future.

Consider the case of the belt drive. If it is discovered that a PdM provider has indicated several times in the past that belts are being worn out quickly, they can take their research a step further, asking, “Is this belt lasting as long as it should be according to the manufacturer? If not, is another factor causing failure?”

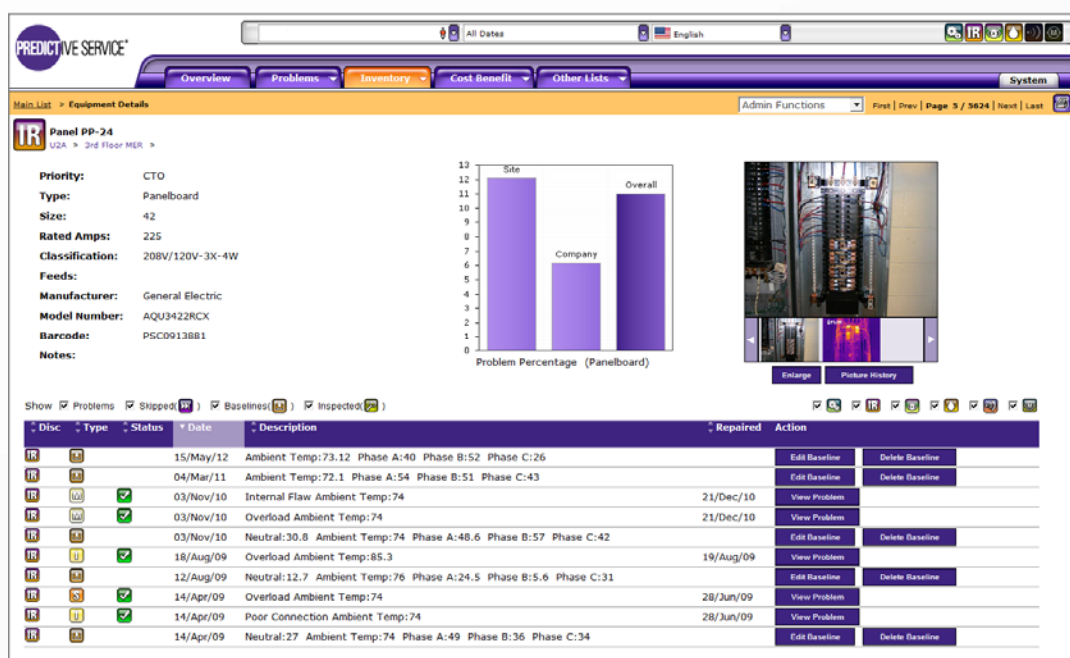
It is frequently the case that faulty parts are not responsible for creating risks: A human element is often to blame. In the case of the belt drive example, belts generally require proper tension and alignment to be effective—something easily thrown off by improper installation, training or tools, not poor equipment design. If this is found likely to be the case, steps could be taken to alter procedures or retrain employees on proper techniques or ways to add precision, ultimately diminishing the need to replace the belts and, in turn, diminishing the amount of money lost in relation to the purchase of new parts and machinery downtime. In the end, the unit's reliability is improved long-term.

Predictive Service: Improving Reliability at No Additional Cost

While it may seem against a PdM company's self-interest to take steps to minimize the amount of PdM a customer will require in the future, at Predictive Service, we believe that reliability analysis should be standard to every engagement. Our customers have come to rely upon us for our unfaltering dedication to preventing failures within their facilities, and now we are adding value to these relationships by minimizing potential issues even further.

We can examine not only equipment and material problems, but all issues affecting maintenance and reliability. It could be the case that certain tools need to be deployed to address a problem, such as a laser alignment device, or it may be that facility processes need to be revisited. Whatever the situation, our experienced program analysts are well-qualified to develop customized, step-by-step improvement plans to achieve an effective asset-management strategy. We are dedicated to working with our customers to eliminate defects and, ultimately, improve precision in operations.

Whereas other PdM vendors keep analytical data private or only record the results of their service visits in one-off, static documents, we maintain a dynamic database of years of PdM events and failure modes to ensure we can efficiently share what we find with our customers to deliver maximum value. Our award-winning, web-based Viewpoint® data storage system makes historical information readily available and easy to share with our customers, whether for a single facility or every facility a customer operates. Viewpoint's intuitive reporting of robust, cumulative data makes it simple for us to distill trends and work toward identifying root causes of failure. Best of all, it enables us to provide this reliability analysis at *no additional cost* to our PdM customers.



Predictive Maintenance and Reliability Analysis: A Recipe for Savings

There is substantial savings inherent to PdM. By keeping strong records through Viewpoint, we have to ability to deliver cost justification for our PdM customers, and can help to calculate ROI. According to the data we've gathered from thousands of PdM events, the cost of recommended repairs is a mere fraction of the millions of dollars that would have been lost by customers as a result of lost production value during downtime or equipment replacement due to failure. In fact, these repairs cost can even be challenged by the energy wasted due to inefficient or failing equipment. Additionally, well-conducted PdM could eliminate the cost of hundreds of unnecessary maintenance events over time.

Our reliability analysis takes savings to an entirely different level. Through program management and close collaboration, Predictive Service can help manufacturers and processors greatly increase throughput, reduce the need for maintenance and realize operational efficiency thanks to our proven assessment methodology and process/product management advice. We make it easy to see how making tweaks to the way your business operates today will yield undeniable value for years to come.

Choose a Reliability Partner

When it comes to keeping your operations running smoothly, PdM is a great investment. It is prudent when choosing a PdM partner, however, to consider the *overall value* the vendor provides. A low-cost provider might seem like the most economical choice for PdM services at first, but further research will likely unveil that they cannot or will not provide value-added reliability analysis. If they do, it very well may come at additional charge.

Remember that if you do not get to the root cause of a problem, it can easily resurface in time. It is generally the case that business operators are not aware of issues with their equipment until it is too late, making it important to partner with a company that has the expertise and resources to give you a comprehensive perspective of your machinery and overall operations.

Our PdM program management and reliability analysis can change your very expectations for your business. With the right partner, you can make sure adjustments are made correctly the first time, and that you are operating equipment on which you can rely well into the future.

For more information on how Predictive Service reliability consulting offerings can yield lasting value for your company, visit predictiveservice.com.