

Failure is not an option! Diagnostics to avoid equipment failures

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Pepper Maintenance Systems, Inc was founded in 1998 by Randall Springer and Keith Schmidtgall. Randy had worked in the grain industry through farming and in grain elevators. Keith owned an industrial electrical company that had serviced the grain industry for many years.

Their goal at the time was to bring infrared inspection services to an industry with great need. Over the years, Pepper Maintenance® has grown from an infrared provider into a full-service reliability company. The team focusses on grain related industries such as elevators, feed mills and flour mills as their primary clientele.

Technologies have advanced and new services have been added through the years to round out the options for their clients and to more completely inspect assets. Not all tools are a right fit for clients. Each client can use any one or all of the tools offered. Building the right programme for each facility is essential to creating a program that works.

Reliability maintenance is about finding faults before they become a major failure. Early detection allows for repairs to be performed during planned downtime. Increasing reliability and efficiency in a facility will reduce costs and increase production without capital expense.

Reliability services currently provided by Pepper Maintenance® include infrared inspections, vibration analysis, ultrasound, motor circuit analysis and motion amplification.

Infrared inspections

The first service offered by Pepper Maintenance®, was infrared inspections. Pepper Maintenance differs from other providers by offering mechanical inspections as well as electrical. By analysing heat flow in mechanical assets, technicians identify abnormalities.

Infrared inspections on electrical systems can detect resistance in connections. Bad connections cause a loss of electrical energy that is already paid for and not used. This lost energy is converted to heat and not used at the motor. There is no other way to identify the source of these electrical resistance connections. Pepper's technicians are adept at heat flow analysis needed to identify problems in mechanical and electrical systems.

Vibration analysis

Vibration analysis gets to the heart of mechanical issues. This technology has the ability to identify many different mechanical faults early in their development. Readings taken directly from each asset are sent to the analysis department.

Faults such as: misalignment, imbalance, bearing faults, gear mesh problems, bent shafts and other issues can be identified. Finding any of these issues will allow a facility to plan their downtime and make repairs before they actually fail. Issues are often found many months and sometimes years before a failure takes the machine down. With plenty of warning time to make repairs, unplanned downtime can be minimised.

Ultrasound analysis

Ultrasound is a great tool to detect failures in slow speed bearings, leak detection and safety when inspecting electrical rooms. It is difficult to predict failures in slow speed bearings using other tools. Ultrasound allows us to listen to the bearings and detect low impact faults.

Identifying defects early is the key to reliability. Leak detection has one of the highest ROI of their services. Finding and repairing leaks in compressed air, steam and other systems can save a lot of money. One small leak in a compressed air system can save thousands of dollars a year. That dollar loss grows substantially with steam systems.

Motor circuit analysis

Motor circuit analysis (MCA) is a great addition to the services Pepper Maintenance provide. MCA provides a complete motor health report with just a short test. Motor windings, contamination, phase angle, resistance and many other conditions can be detected with MCA.

With the high efficiency motors in use today, knowing of any issues that could compromise value and health is important. Motor testing is quick, taking only three-to-five minutes initially, and identifies issues that could affect the efficiency or operation long term.

Motion amplification

Motion amplification is a video technology that has taken the world by storm. This technology has only been developed for a few years but is opening our eyes to conditions that we knew were there but could not prove and help our clients understand these issues.

A short video is taken of an asset and any motion that is there, is amplified. We can then see the dynamics of how equipment is working and many deficiencies that may be present. Specific frequencies can be enhanced or isolated to identify the root cause of a problem.

Improper support, misalignment, flexing of parts can all be visualized through motion amplification. This technology can be used on structures, rotating equipment and other equipment. Motion amplification can be used for problem assets, one that has had chronic problems, or for the verification of new installations to ensure it is ready to perform as planned.

Precision Laser Alignment

Precision Laser Alignment was added to meet a need that was lacking in our industry. Using vibration analysis, we noticed a lot of misalignment in the equipment we inspect. Our clients were having difficulty finding providers that could perform alignments.

Precision alignment of both shaft and sheave units was an opportunity to fill this need. Misalignment will use more electricity and cause unnecessary wear and tear. Ensuring that belt drive sheaves are in plane and belt tensions are correct, give each unit the best start to perform as designed. Shaft alignment is even more critical. It is very important for the life and efficiency of equipment that units be aligned properly. Some manufacturers require alignment to be performed.

Planning for reliability

Reliability maintenance tools are a part of preventative maintenance programmes. They are used for the early detection and planning of repairs to prevent failures during operation. Failures do not occur when facilities are slow. They occur when we are pressed for time and busy.

Finding these failures early and preventing unplanned downtime is Pepper Maintenance's primary goal. Reducing cost of electrical usage and the additional damage of a failure is a significant benefit as well. Working as a team with management, operations and maintenance together will improve the overall success and improve the reliability of each facility.