

Duracell Uses Multiple Technologies to Save Hundreds of Thousands of Dollars in Equipment and Production

RESULTS

- \$200,000 saved in lost production and equipment replacement through compressor motor gearbox analysis
- \$100,000 saved in lost production avoidance through infrared scanning of cam roller bearings
- Multiple technology monitoring increases uptime of production and facility equipment



APPLICATION

Production and facility machinery in large battery production plant, 450+ employees, established in mid-1960s

CUSTOMER

Duracell, Cleveland, TN

CHALLENGE

Machine failure caused problems and shutdowns in the production line. Reactive maintenance costs were high, and delays meant loss of production during machinery replacement. Meeting production demands meant excessive labor expenses for emergency repair and unplanned overtime.

SOLUTION

To keep the plant producing at optimum capacity and reduce repair and overtime expense, this Duracell plant implemented a Reliability-Centered Maintenance (RCM) program based on FMEA (Failure Mode Effect Analysis) and using multiple CSI technologies from Emerson's Machinery Health Management.

Numerous failures on cam roller systems in the battery carousel made the bearings lock up, causing the rail to fail and other components to break and ultimately shutting down the production chain. An Emerson CSI infrared camera is now used to locate hot bearings at early stages of failure so repairs can be scheduled. Reliability Manager Dan Disney says "We can detect early levels of failures and plan around that." The proven value of this technology led to even more precise reliability planning with the installation of permanent accelerometer cables on the cam roller assemblies for vibration analysis with the portable CSI Machinery Health™ Analyzer.

"We scan a route of motors and pumps with our IR camera and if we find a heating problem we come back with vibration to verify the problem. If necessary, we use our laser alignment capability to fix it perfectly and put it back in operation."

*- Dan Disney,
Reliability Manager*

Another example of value with multiple technologies was detection of a significant vibration reading on a 400 horsepower compressor motor assembly. This was confirmed with ultrasonic readings from the CSI 7100 Machinery Health Scanner. The compressor train was brought into the repair shop and rebuilt and the assembly returned to the manufacturer for gear casing reinstallation. When the assembly was reinstalled, gearmesh vibration frequencies were drastically elevated and early signs of damage became apparent. High frequency and high resolution data were collected and the problem was isolated to misalignment and improper loading of the gears.

Despite assurance from the manufacturer the problem was demonstrated by disassembling the machine and using the CSI UltraSpec® Pro Laser Alignment System to precisely align the components during reassembly. The verified corrections were reported to the manufacturer who recognized their mistake in the initial rebuild. "They became believers," said Disney. Loss of this large compressor assembly would have shut down the entire plant for four to six hours while a replacement was installed; cost would have been about \$200,000.

Integrating a variety of Machinery Health Management technologies into Duracell's RCM program means the most exact diagnosis possible. Data from CSI technologies is integrated for storage, trending, analysis and reporting using AMS™ Suite: Machinery Health Manager software in a complete, accurate, easy to understand report.

Manufacturing plants in any industry using multiple reliability technologies have advantages over single technology users. AMS Machinery Manager software combines data from those technologies into a powerful integrated database for a complete view of your plant's equipment health.

***"We use multiple technologies
all the time to verify problems."***

***-Dan Disney,
Reliability Manager***

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