



Electric motors: Performance partnership increases reliability and reduces costs

Electric motors are one of the most prevalent equipment in industrial operations – and when they fail, they often fail prematurely, costing industry millions of dollars in repair, equipment and downtime. A unique partnership between International Paper USA, SKF and independent motor repair shops has enabled International Paper to significantly reduce costs while enhancing reliability. At the same time, the partnership has resulted in significant advantages for motor repair shops, creating a win-win-win opportunity that would not have been possible without the partnership effort.

The situation

An average paper mill typically has between 3 000 and 10 000 electric motors in operation. At International Paper USA, an internal evaluation of reliability data revealed that motors consistently ranked among the top five equipment failures, costing the company millions of dollars annually. A corporate Motor Task Team was formed to improve motor repair quality, with the goal of increasing Mean Time Between Failure (MTBF) from the typical 4 –14 years, to 20 years.

At the same time, SKF, a world leader in bearings, machine reliability and condition

monitoring, was in the early stages of implementing its SKF Certified Rebuilder programme, a motor repair shop certification initiative. When SKF contacted International Paper for input, the two companies saw an opportunity to work together towards the common goal of improving motor reliability and reducing motor-related expenses.

Through the partnership, SKF developed and managed the shop aspect of the project by defining mechanical best practices and standards, monitoring performance and providing training and engineering support to motor repair shops. International Paper

This is an abbreviated reprint of the paper "Partnering for improved motor reliability" by Mark Zawadzki, International Paper and Fredrik Fränding, SKF, presented at the Euro Maintenance conference on Asset management & Production reliability, Brussels 2008".





The SKF Certified Rebuilder programme

Industry statistics, as well as International Paper and SKF assessments, confirm that most in-service electric motor failures result from mechanical problems, including unbalance, fits and tolerances, machining practices, assembly/disassembly damage, contamination, corrosion, storage and handling damage, lubrication issues and more. Many of these root causes resulted in bearing failure.

To alleviate these problems, and to help International Paper achieve its goal of a 20-year MTBF, the SKF Certified Rebuilder process assisted motor repair shops in adopting an OEM approach to motor repair. This approach demanded adherence to uniform SKF repair standards that went beyond those specified by NEMA, API, EASA, GM and other industry organizations. To attain certified status, the motor repair shops were required to meet SKF standards governing service, procedures, quality control, acceptance testing, cleanliness, tooling, bearings and components, workplace conditions and more. In-depth and ongoing training in skills and techniques targeting the critical aspects of motor servicing was provided.

Once certified, the shops were required to exhibit continuous improvement and pass annual audits examining everything from equipment calibration and lubrication practices to motor disassembly/assembly procedures, work processes, conformance testing and staff training, and other quality and best practice procedures.

took responsibility for driving programme implementation among vendor motor repair shops by communicating the 20-year MTBF reliability expectation, the urgency of the programme, and required benchmarks, specifications and standards. Shops agreeing to step up to the challenge were offered the opportunity to enhance capabilities in technology, quality and best practices.

In return for their efforts in gaining certification status, motor repair shops gained access to SKF worldwide engineering expertise and technology and field support to assist in failure analysis and onsite inspections.

International Paper remained highly involved in all aspects of the training, contributing their own assessments, and communicating to workshops the importance of the certification process.

The results

In the two years since implementation, motor repair shops serving International Paper's US mills have embraced the certification programme, undergone audits and implemented continuous improvement processes. Although it is too soon to fully evaluate the impact of the improvements, a 10% overall reduction in reliability incident costs for electric motors has been documented since the project began.

Data from one International Paper mill has tracked the total purchase cost for new motors, as well as total purchase costs for motor repairs. Between the years 2006 and 2007, new motor purchases were reduced by 39%; repair purchases were reduced by 45%; the number of AC motor repairs was reduced by 33%; the number of DC motor repairs was reduced by 32% and new LVAC motor purchases were reduced by 18%.

A win-win-win advantage

To create sustainable change, all partners must benefit from an initiative. By delivering advantages to all players, the programme has achieved outstanding success. International Paper has reduced motor-related costs and improved reliability. SKF has gained customer partnerships with both International Paper and SKF Certified Rebuilders. And, motor repair shops who have met the challenge, have strengthened their customer relationships, established a competitive differential, and gained access to SKF expertise in advanced technologies and engineering support.

For more information, contact your SKF Certified Rebuilder



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