Written by MT Staff
Monday, 18 April 2011 12:58

The issue's edition of The Reliability Files includes information from Littelfuse and Inpro/Seal.

7+ Years And Counting: A Case Study Of Sealing Success

Problem

A nationally known gypsum company was experi-encing sealing problems with its product-mixing machines. It contacted Inpro/Seal® for help.

The plant turns out a range of gypsum-board and interior-finish product, including

joint-treatment compounds, tape and plaster. Two large, twin-shaft mixers are used in the process—*one for dry bagging compounds and the other for compounds used for ready-mix products* . Located high, near the top of the building, these machines operate five days a week, intermittently because of the batch-style process.

With the standard sealing configuration, dry-powdered product was leaking around the shaft penetrations in the mixer. Facility engineering personnel attempted to implement other sealing solutions, including packing and a competitive product seal, both of which required substantial maintenance to be successful. Due to less- than-optimal attention to required maintenance, however, both options failed to keep the gypsum contained within the mixer, leading to several problems.

While gypsum may be a fine powder, it's also abrasive. When packing was used to seal the mixer, the gypsum would frequently get caught between it and the shaft—*eventually resulting in scoring of the shaft.*

Product that escaped from the mixers was considered contaminated and had to be scrapped. In fact, the facility estimated it was racking up $5000 to $10,000 each week just in lost product. In addition, the product that was being released into the atmosphere was creating significant environmental and housekeeping concerns.

In one case, the powder migrated into the electronic process controllers and caused over $400,000 in equipment failures—*and that didn't include the cost of lost production.*

Solution

Working with their local Inpro/Seal regional sales manager, the plant's reliability engineers decided to install Inpro/Seal Air Mizers® on each mixing machine. (In total, they utilized eight Air Mizers to fully seal the two twin-shaft mixers.)

The Air Mizer is a non-contacting product seal that uses small amounts of air to create a positive purge along the rotating shaft—*sealing product in the equipment and keeping contaminants out.* It fully articulates to accommodate radial and angular shaft movement and shaft run-out.

For this application, the Air Mizer was designed to use 4-6 SCFM of air at an operating pressure of approximately 3 psi above the maximum mixer pressure. The application also required split seals that could be easily installed (without having to dismantle the mixers).

Return On Investment

The gypsum mixers have been operating since August 2003—*without the need for maintenance or replacement parts.* The facility's operators have been pleased with the performance of the Air Mizers and the significant return on their investment. They've also expressed overall satisfaction with the technical support they received from the Inpro/Seal team. They no longer worry about product loss, damage to plant equipment or environmental hazards within their facility due to leaking seals.

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For more info, enter 260 at www.MT-freeinfo.com

Solve The #1 Motor-Failure Problem With Accurate Temperature Detection

Problem

A thermal-based motor overload relay may allow a restart on a hot motor prematurely because a bimetallic overload relay cools faster than the motor it is protecting. Once the relay resets, an operator can restart the motor, potentially causing costly equipment damage. The National Electrical Manufacturers Association (NEMA) reports that for every 8-10 degrees a motor is operated above its manufacturer's recommended maximum operating temperature, motor life is cut by half. To preserve the investment in a motor and avoid downtime and replacement labor, an accurate measurement of motor temperature is essential.

The elements of a traditional bimetallic overload clearly have less mass than a motor and can be expected to cool faster. Manufacturers take this into account when designing these devices, which generally do a reasonably good job of emulating the condition of the motor (assuming they are installed in the same ambient temperature environment as the motor). However, the sensitivity of the traditional overload device cannot adjust dynamically to respond to overloads and time; consequently, it cannot provide an accurate temperature model in all situations. Also, each time a bimetallic overload trips, its setpoint shifts slightly. After a number of trips, it will drift out of calibration.

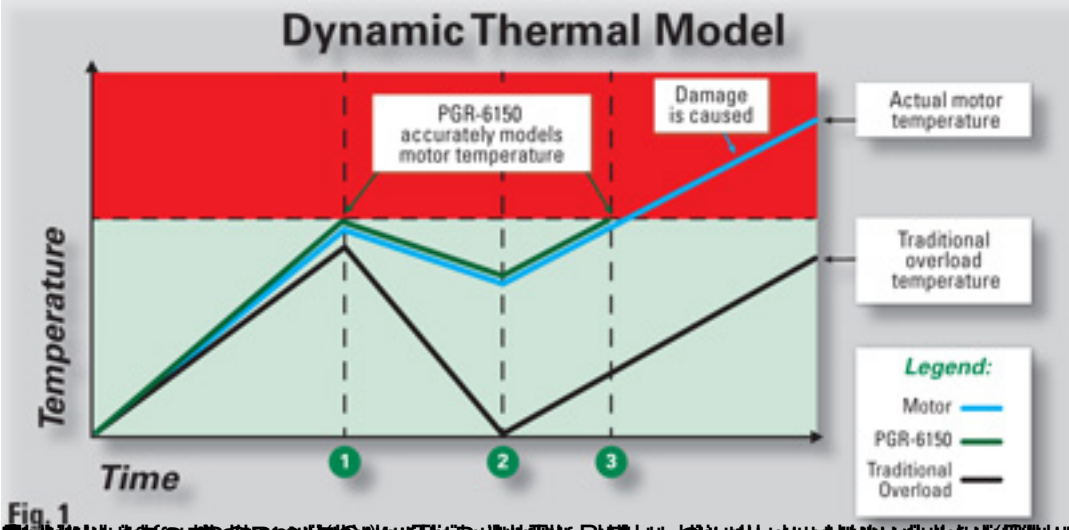

Fig. 1

[redacted] www.littelfuse.com/protectionrela

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