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Here's how proactive condition monitoring is helping an energy-services provider defuse a process safety challenge.

Conveyor systems aren't just subject to considerable wear. Even in normal use, they can face the risk of fire due to equipment failure or ignition of the materials being transported. In Amarillo, TX, energy-services provider Savage is successfully employing state-of-the-art online condition monitoring on a coal-conveyor system to help eliminate that concern and ensure safe and uninterrupted supply of fuel to Xcel Energy's Harrington Generating Station.

The challenge of PRB coal

The coal-conveyor system plays an important part in the operation of the Harrington Generating Station: A reliable and trouble-free supply of fuel is critical to secure energy production. The Harrington plant, owned and operated by Xcel Energy, gets its coal primarily from the Powder River Basin (PRB) in Wyoming. A special property of the PRB coal is its propensity to self-ignite. Another characteristic of this coal is its friability, creating combustible dust that can penetrate into bearings and other parts of the conveyor system.

While PRB coal has become popular—*based, in large part, on its low cost and low sulfur content*—that popularity comes at a price. The potential for spontaneous combustion calls for safe operation and maintenance in coal transportation systems and stockyards. Good housekeeping practices, such as properly managing coal stock piles, limiting dust accumulation, preventing spills and conducting regular cleanups are extremely important. For the Savage maintenance department, handling PRB coal has

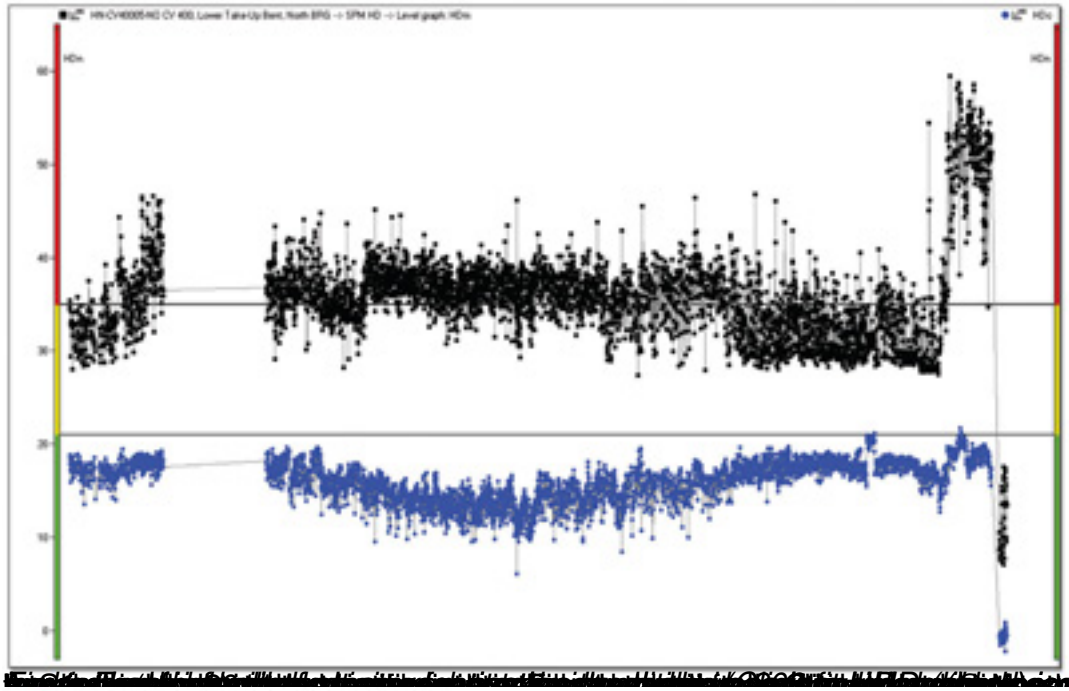
introduced extraordinary hazards. Careful management of these hazards is a must. A mechanical fault in the bearing of a roller, for instance, could cause ignition of the belt or coal. Friction between a seized roller and the belt could also lead to fire. The site's online condition-monitoring program plays an essential role in dealing with the safety issues that come with the handling of PRB coal.

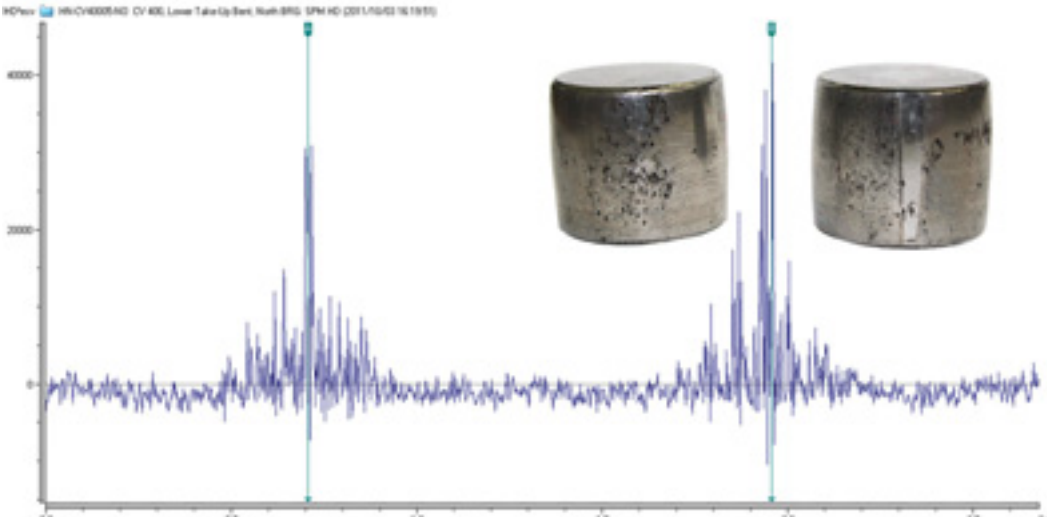
Condition monitoring: a proactive strategy

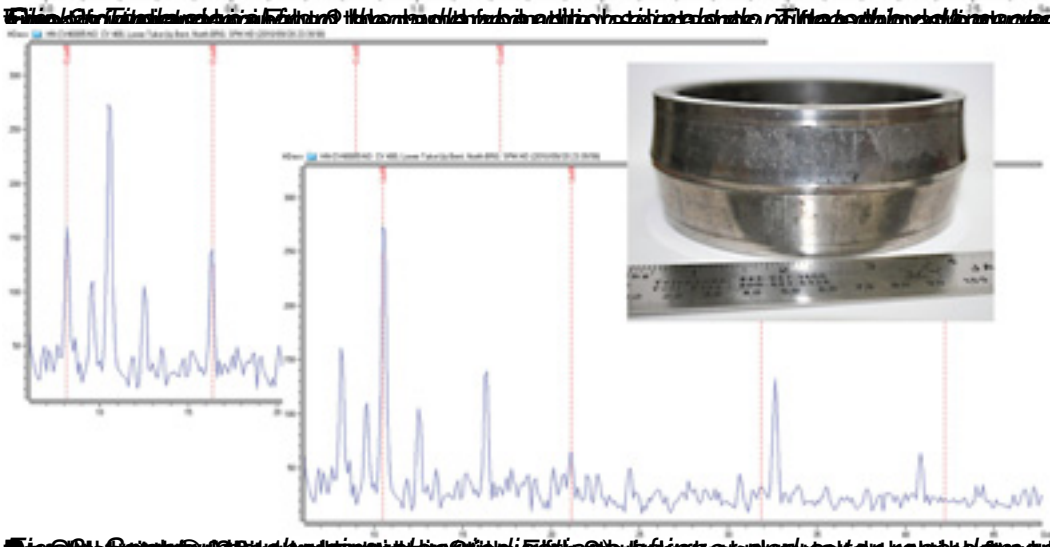
Savage implemented its condition-monitoring program to monitor plant machinery and detect potential failure at an early stage. In late 2009 and early 2010, the Intellinova® online system from SPM Instrument was installed to monitor 40 conveyor and crusher bearings. The condition of these bearings is measured with SPM HD®, a new and advanced shock-pulse measurement technique. Particularly well-suited for low-RPM applications, this new technology can be utilized on rolling-element bearings throughout the range of 1-20,000 RPM. At the Savage Harrington location, the conveyor system runs at approximately 120 RPM.

A prominent feature of the SPM HD technique is its capacity to detect machine problems at a very early stage and provide reliable diagnostic information months before replacement of a damaged part becomes necessary. SPM HD delivers immediate condition evaluation in green-yellow-red and presents measuring results with remarkable detail, giving a clear picture of bearing condition.

Savage's condition-monitoring program was off to a flying start. Initial readings in June 2010 indicated deteriorating condition on one of the pulley bearings. With the online monitoring system, Savage personnel were able to keep a watchful eye on development of the damage for a full 15 months before the bearing needed replacement.







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