Smart Sieve

A virtual engineer, fully dedicated to the state-of-health of your installation: **InfraLytics®**

The Context

A Sieve is used when producing powders, fertilizer, granulates, but also in food processing and other industries. It can be employed in multiple stages of the process, for example in separating different fractions that have to follow different process routes, or when isolating the final product from the overall stream. A smootly running sieve means a smoothly running process. Clogging, breakage, damage... are to be avoided to ensure smooth operations onsite.

Efficient operations

The sieve is running efficiently if it vibrates in a uniform way at a constant frequency and a constant amplitude. Non-uniform vibrations or shifts in frequency can be indicative for a distorted (so less efficient) sieving process, but also for structural damage. Issues can be related to mounting, springs, excenters, foundation, loose decks or other components. Continuous monitoring of data related to 3D vibrations in multiple locations as well as incoming product flow rates allows the software to identify deviations and send out warnings in an early stage, together with the necessary context and background. As such process distortions can be avoided and more expensive, structural, damage prevented.

The Solution

At Zensor we provide a dedicated, modular, product for the continuous follow-up of sieves. The product comes in the form of a dedicated software and a hardware add-on (sensors and data acquisition) if not enough data would be available. At first the client indicates which of the aspects (listed below) are relevant to their sieve, and subsequently the Zensor specialist configures the product. When required additional hardware is installed. Once launched, the software continuously crunches the incoming data and translates it into warnings in case of upcoming damage or breakdowns.

Excenter Health

In most cases the shaking movement is generated through an eccentric mass that is rotated. The goal is to induce strong, but uniform vibrations. This can of course lead to damage to other components, or the shaking system can get damaged. Combining data related to motor currents as well as 3D vibration data, proper working of the eccenter can be tracked and upcoming damage to the setup can be detected in an early stage.

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Motor health

The main motor is driving the heart of the operation of the sieve. The motor is running continuously, not always fully shielded from the dynamic process it is piloting. Combining a follow-up based on vibrations, temperatures and electrical currents the software tracks the state-of-health of the motor continuously. Deviations are detected in an early stage based on spectral analysis and unwanted standstills or major damages are prevented.

Bearing health

The bearings are continuously in use as well, not always fully shielded from the dynamic process in the continuously shaking sieve. Combining a follow-up based on vibrations and temperatures, the software tracks the state-of-health of the bearings continuously. Deviations are detected in an early stage based on spectral analysis and the maintenance crew is informed when necessary.

Material Buildup

Structural or component issues are not the only unwanted issues that can occur in the operational context of a sieve. Sometimes the material flow is distorted. For example a material buildup due to non-uniform supply, humidity changes or clogged holes in the deck. In such case the material isn't falling through the decks uniformly, or a block of material is attached permanently to the structure. The result is a lowered efficiency, but also increased loads on the installation itself, which often leads to accelerated wear or degradation. Using vibration data from different locaiotns combined with material flow rates, the software can identify material buildup in an early stage, locate it and send out a warning to the operational team to help them quickly solving the issue.