RS Industria's real-time cloud platform preserved jam producer's critical filling machine from catastrophic failure

The jar-filling line is a critical asset, and any breakdown would significantly impact operational revenues. Two key components of the line, the power transfer boxes, cannot be checked using conventional inspection techniques as they are inaccessible and sealed for life. RS Industria solved this problem by using their cloud-based IIoT platform to continuously monitor the boxes for excessive vibration. Within weeks, the system automatically sent alerts to the maintenance team, warning them of potential failure. They responded by reducing the speed of the filler until a replacement transfer box could be procured and installed. RS Industria enabled Histon to avoid a catastrophic failure of the transfer box, saving many thousands of pounds in lost production and damages.

Problem

- Histon's maintenance team were unable to inspect and maintain two key production line components due to inaccessibility and design.
- Failure of these components would stop the line and incur significant operational and financial loss

Solution

- RS Industria fitted vibration sensors to the transfer boxes, with sensor data continuously uploaded to their AWS cloud-based industrial data solution.

Outcome

- RS Industria automatically detected excessive vibration on one transfer box and sent alerts via SMS and email to key personnel
- The maintenance team were able to run the line at reduced speed and to maintain a real-time watch over the condition of the component, maintaining production until a replacement was procured and installed

Histon Preserves, based in Histon Cambridgeshire, make a wide range of marmalades and jams, including some of the UK's most famous brands including Golden Shred, Frank Coopers and Hartley's

RS Industria is part of RS Group, a global supplier of industrial spares, components and consumables. It offers asset and energy monitoring services to industry, enabling their customers to manage energy & other utility costs, improve reliability and reduce manufacturing costs

Inaccessible sealed units prevented inspection of critical components

Right-angled power transfer boxes are critical components frequently used in high-speed filling machines as they are simple and robust, connecting the main filler to the blower, and ensuring that these two key parts of the machine are always synchronised. Such boxes are also used extensively in other manufacturing and are generally a good solution for transferring power within a single machine. However, they present some maintenance challenges:

Sealed for Life - The boxes are assembled and sealed when manufactured, so they can't be opened up for routine internal inspections, and there are usually no sight-glasses to view the internal lubricant level.

External Inspection is Difficult - Transfer boxes are usually located under the filler production line, making them difficult to reach and view. If not regularly cleaned, they are usually covered in food debris, which is often corrosive (especially sugary or acidic products), damaging the casing, leading to lubricant loss. High-pressure water cleaning can also cause ingress of water via bearing seals, degrading the internal lubricant, and steam-cleaning also removes any visual indications of lubricant leakage or water ingress that might indicate poor internal gearbox condition.

Real-Time Vibration Monitoring

Several vibration sensors were fitted to the critical filling line, including the two transfer boxes. Using RS Industria's innovative '*stratified vibration analysis*' only a single vibration sensor is required to monitor three key aspects of a component's condition:

1. **Asset Motion** - This variable measures the overall movement of the asset, highlighting looseness of mountings or misaligned drive shafts.
2. **Lubrication Failure** - Mating surfaces, such as gear teeth, require a continuous film of lubricant. If that film starts to break down, specific frequencies are generated, and this indicator can automatically detect them.
3. **Bearing Wear** - This monitors the specific frequency ranges associated with wear on bearing surfaces, caused by misaligned shafts, damaged bearing components or leaking seals.

If any of these variables exceeds their baseline limits, the system will automatically generate an immediate alert, distributed by email or SMS to key personnel, enabling a rapid response.

Early warning avoided catastrophic failure & enabled continued running

Some months after the installation of the sensors, excessive vibration on one of the boxes triggered automatic alerts, indicating significant bearing wear within the box. With this knowledge, Histon were able to avoid a potentially catastrophic failure that would have shut down the line for many weeks.

With a two-month lead time for a replacement, the engineers at Histon decided to continue running the line at reduced speed but with close monitoring. Using the real-time vibration data from RS Industria, they were able to continue a reduced level of production, nursing the line along until the spare transfer box was delivered, confident that they could avoid a sudden failure. This also give the maintenance team time to prepare, enabling a swift and problem-free replacement when the new transfer box was finally delivered