

IoT HUB

A SOLUTION FOR PRESS CROWNS



INTRODUCTION:

The press is the starting point for automotive manufacturing. The function of the press is to quickly and precisely form vehicle body parts. The press crown is the upper structural weldment of a press, containing cylinders that drive the motion of the ram which forms the parts. Any disruption to the operation of the press crown can stop production.

Like any mechanical system, the moving parts in the press crown (including the bearings, gears, and belt pulleys) are subject to failure. Unfortunately, they are very difficult to access for maintenance and monitoring. The process of performing monthly route-based vibration monitoring is time consuming, unreliable, and can expose the technician to unnecessary risks and dangers.

THE CHALLENGE:

- The aggregate, traditional route-based monitoring consumes a tremendous amount of the technician's time. Each press crown has a junction box, where a technician takes vibration readings every month with a handheld computer. Since a typical press has 5 crowns, multiple measurements are required each month.
- Traditional route-based monitoring necessarily results in large time gaps in data collection where the health of the asset will be unknown.
- The exact moment at which the technician takes each sample will vary and results in samples being taken at different stages in the cycle of the press. It is critical that the samples be taken at the correct time in each of the press cycles and that the timing is consistent for comparative analysis.

COST OF THE PROBLEM

\$30 Million
Press
Replacement

\$10,000-\$25,000
per day
Labor Costs for
Repairs

\$10,000-\$50,000
Overnight
Shipping Costs
for Parts

PRESS CROWN VULNERABILITIES



FLY WHEEL FAILURES

Over time the fly wheel coupling will wear or become off-centered, which can damage the gear in the crown of the press line.



CLUTCH BRAKE SLIPS/FAILURES

This causes the gears to go into motion prematurely, damaging the gear. The clutch brake can also fail when there is an inadequate amount of hydraulic fluid.



TRANSFER ARM BREAKS

This condition will shut the entire press line down because a failure in the transfer arm prevents metal being moved from one press to another.



CONTROL ARM BUSHING FAILURES

This condition can lead to improper gear mesh, damaging the gears and contaminating the lubrication oil with brass shavings.



CUSHION FAIL

Metal filings in the oil system cause the system to become plugged and fail.

IoT HUB SOLUTION

KCF Technologies IoT Hub is a proprietary solution that uniquely addresses the challenges of monitoring the press crown. The IoT Hub includes a multi-input solution that enables data to be regularly collected from the existing sensors embedded in the press to create an accurate current and historical assessment of the health of the asset. The data acquisition is triggered through connection to the press controls, so that measurements are synchronized and the readings are taken at the optimal time of each of the press cycles. Consistent measurements are obtained which enable far more accurate monitoring and diagnosis.

WHY HASN'T THIS BEEN SOLVED BEFORE?

Until the development of the IoT Hub, there was no cost-effective way to connect to the existing sensors embedded in the press crown, take multiple triggered synchronized readings, and transmit the data wirelessly to an easy to use software platform.



A UNIQUE FIX FOR PRESS CROWNS

When correctly implemented, the lot Hub enables the operator and maintenance team to detect developing problems and take planned and structured action to mitigate developing conditions. Proactive scheduled maintenance and repair is much safer and more effective. Over time, KCF Technologies Sentry team will work with the operators and maintenance teams to identify sources of degradation and help reduce damage and extend component life. This state-of-the-art monitoring solution will also enable fact-based system improvement development and validation of system and operational changes.

TRIGGERED DATA COLLECTION

In collaboration with the operators, the system is configured to acquire data at the precise time in each of the press cycles to ensure consistent and reliable measurement. KCF's IoT Hub eliminates the need for route-based monitoring, creates a more complete picture of asset health, and results in safer more reliable data collection.

LEARNING

All machines and processes change over time and are subject to variability in maintenance and wear. The Hub will enable identification of the root cause of damage to the press crown system and enable fact-based decisions to be made to changes in operation or maintenance procedures.

OPTIMIZATION

KCF personnel work with the operations team to suggest changes that reduce the damage and risk factor. These can include changes to the start-stop controls, speeds, and other factors. Over time, the real-time monitoring data can be programmed to feed information directly to the system controls, enable automatic system improvement.

AUTOMATE

SOLVE

ILLUMINATE

