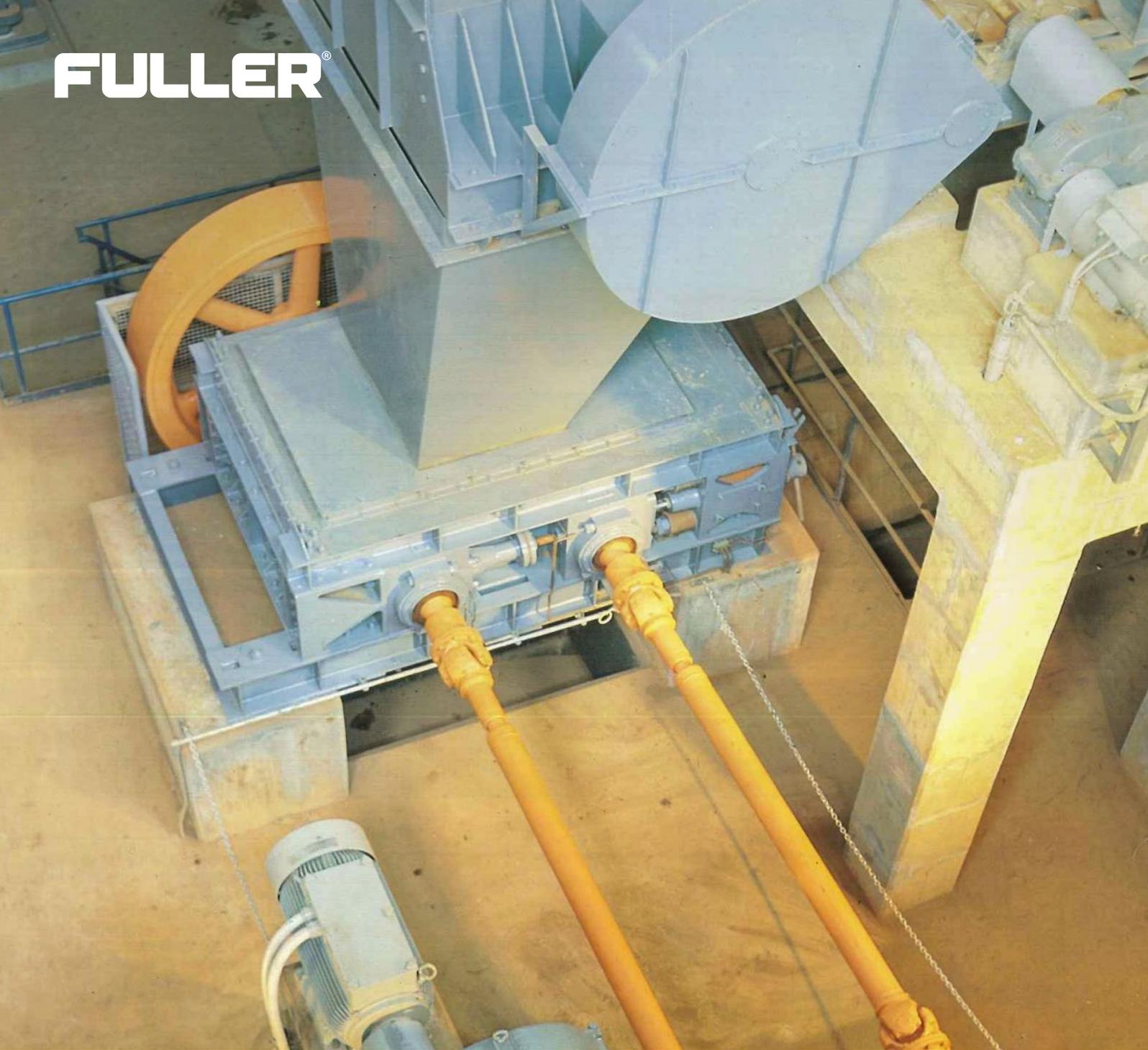


FULLER[®]



ONLINE RELIABILITY SERVICES

FOR EH & MHC ROLLER CRUSHERS

MONITORING AND EXPERTISE TO IMPROVE ROLLER CRUSHER PERFORMANCE AND **AVOID UNPLANNED DOWNTIME**

Roller crushers may be relatively simple in concept and construction, but that doesn't mean they have an easy job. These rugged and versatile machines have been around for over a century, crushing various feed materials. They must withstand harsh operating conditions, surviving constant impacts, abrasive wear, and high forces to reduce cement raw materials with minimum intervention; any disruption or unforeseen downtime risks production delays, increased costs, and quality issues.

Our Online Reliability Service for roller crushers enables early identification of potential issues before they escalate.

Multiple sensors installed on your crusher transmit real-time data to our Global Remote Service Centre, where specialists continuously monitor the equipment for process abnormalities, component failures, and other operational deviations. By applying early-warning analysis techniques, including Rule Based methods, Condition Based monitoring,

Artificial Intelligence and Machine Learning (AI/ML), and custom-created models, we identify when equipment failures may occur and recommend the appropriate corrective actions to optimize your crusher's performance.

KEY BENEFITS

01

Increase uptime
and output.

02

Gain fuel and
power savings.

03

Lower labor costs by
transforming unplanned shutdowns
into planned ones.

04

Extend equipment lifespan with
improved preventive maintenance.

05

Reduce premium costs and services
by having the right spares on
site at the right time.

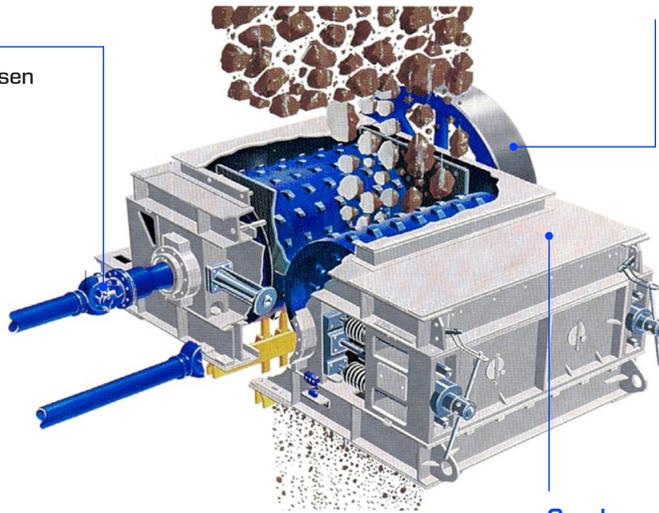
06

Return of investment:
3 months

ROLLER CRUSHER

Coupling

- Wear, loosen pin shaft



Motor

- Rotor Failure: broken/cracked rotor bar, rotor imbalance, loose rotor, rotor bow
- Bearing failure: subcomponent, rotational looseness, lubrication problems, cocked bearing, structural looseness
- Stator failure: voltage imbalance, eccentricity, soft foot, phase loss, insulation and windings problems
- Misalignment
- High/low temperature

Crusher

- Bearing failure: subcomponent, rotational looseness, lubrication problems, cocked bearing, high/low temperature
- Bearing: excessive skewing (misalignment between roll and bearings)
- Bearing: increased axial load due to skewing, structural looseness, break/crack overload

Gear Box

- Bearing failure: subcomponent, rotational looseness
- Tooth wear: cracked or broken
- Misalignment: gears or motor
- Eccentricity and backlash
- Bearing: high temperature

The OEM expert advantage

Many providers offer to monitor your equipment, but do they truly understand your roller crusher? We have decades of experience installing, troubleshooting, maintaining, and optimising roller crushers. We have integrated that OEM experience and insight into our ORS. So, while others tell you what to worry about, we tell you how to solve recurring problems and enhance reliability. This includes extensive root cause analysis to prevent minor issues from escalating into major problems.

After all, your success is our success. Our OEM expert advisors support and coach your maintenance personnel to achieve excellence, delivering optimised maintenance planning and effective maintenance procedures.

A comprehensive monitoring package

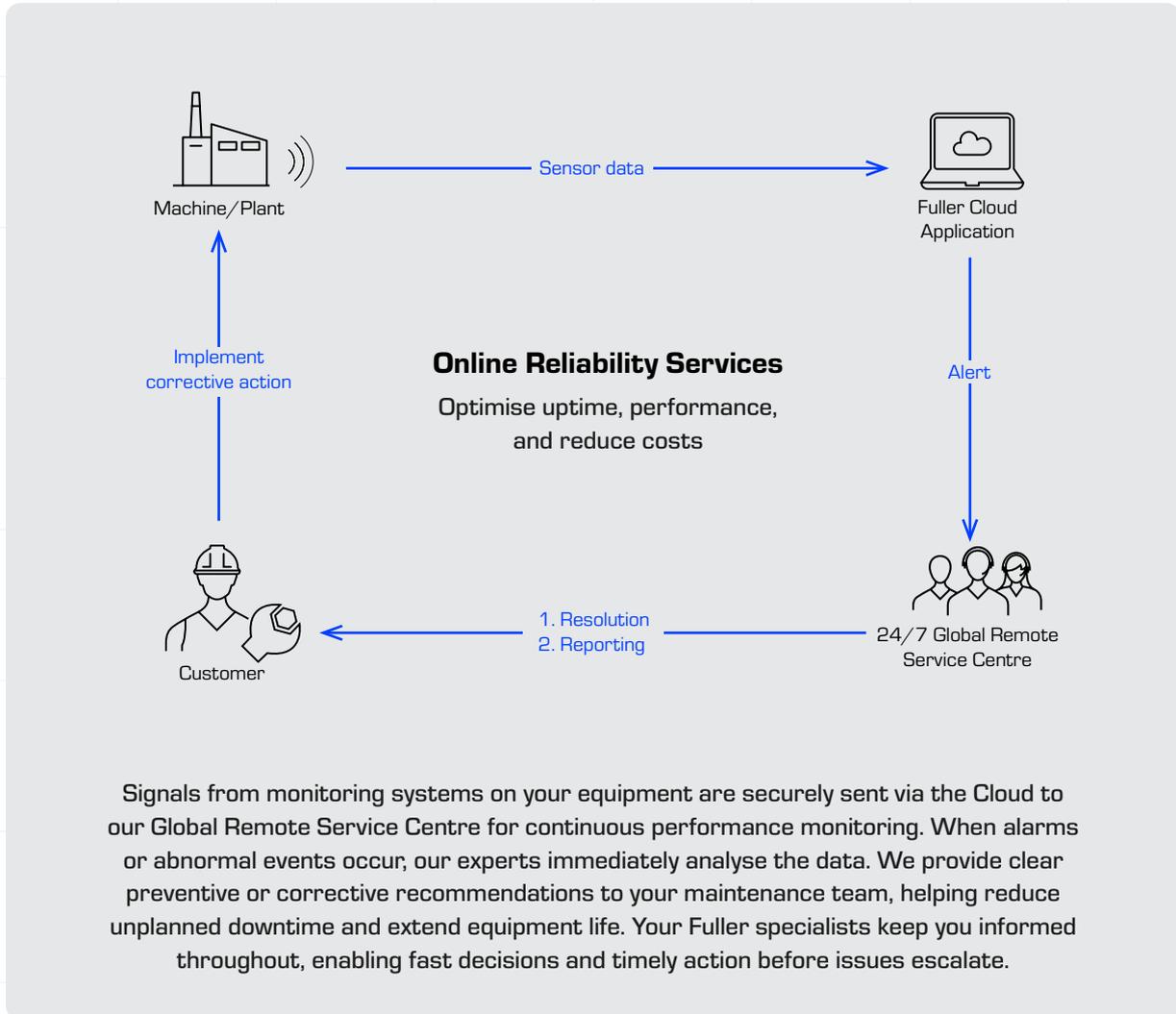
Our ORS use existing control system signals to identify common issues with the bearings, gears, and motors, such as misalignment, overheating, overloading, and component damage. On top of

this, we provide additional monitoring systems, such as vibration, optics, image processing, electromagnetic, ultrasonic, and oil analysis, to detect a broader range of abnormal conditions and component failures, delivering continuous insight into your roller crusher's status.

Implementing ORS

A Fuller project manager will oversee the delivery of any hardware required to provide the service. Your maintenance team will usually be able to install the sensors themselves; however, we can offer installation as an optional extra. After the Health and Usage Monitoring System (HUMS) is installed, we will come to you and commission the systems. Once commissioning is complete, the project manager will hand over to a dedicated service account manager, whose job is to support your maintenance department as their go-to contact whenever assistance is needed. The service account manager will initiate and drive the service to deliver on your KPIs, ensuring that you receive optimal value.

HOW DOES ORS WORK?



Signals from monitoring systems on your equipment are securely sent via the Cloud to our Global Remote Service Centre for continuous performance monitoring. When alarms or abnormal events occur, our experts immediately analyse the data. We provide clear preventive or corrective recommendations to your maintenance team, helping reduce unplanned downtime and extend equipment life. Your Fuller specialists keep you informed throughout, enabling fast decisions and timely action before issues escalate.