FULLER®

ONLINE RELIABILITY SERVICES

FOR OK™, ATOX®, AND FULLER VERTICAL ROLLER MILLS FOR SEPARATOR AND MILL

MONITORING AND EXPERTISE TO IMPROVE VERTICAL ROLLER MILL PERFORMANCE AND AVOID UNPLANNED DOWNTIME

Vertical roller mills grind various materials at the cement plant, such as limestone, clinker, slag, and coal. Combining drying, milling, and separation into one unit, these mills are more flexible and energy efficient than traditional ball mill operations. However, they must withstand complex and dynamic operating conditions and lose performance quickly if not effectively monitored and operated.

Our Online Reliability Service for vertical roller mills enables early identification of potential issues before they escalate. Multiple sensors installed on your mill 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 mill's performance.

KEY BENEFITS

01
Increase uptime and output.

02
Gain fuel and power savings.

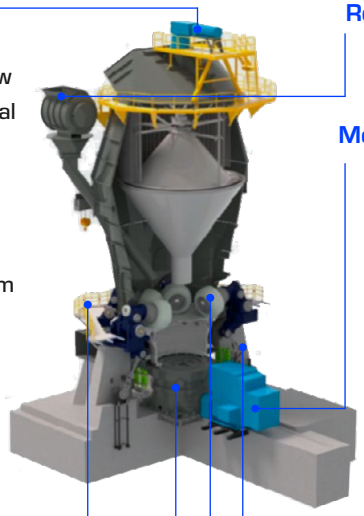
03
Lower labor costs by transforming unplanned shutdowns into planned ones.

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

VERTICAL ROLLER MILL



Separator Drive Train

- **Motor Rotor failure:** broken/cracked rotor bar imbalance, broken/cracked rotor bar, loose, bow
- **Motor Bearing failure:** subcomponent, rotational looseness, lubrication problems, cocked
- **Motor** structural looseness
- **Motor** Stator failure: voltage imbalance, eccentricity, soft foot
- **Motor** Phase loss, insulation & windings problem
- **Motor** Misalignment motor/gearbox
- **Gearbox** Bearing failure: subcomponent, rotational looseness
- **Gearbox** tooth wear, cracked or broken.
- **Gearbox** misalignment gears or motor
- **Gearbox** eccentricity and backlash

Rotary Feeder

- High/low temperature

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 bearing temperature

Table

- Tilting: unequal axial clearance

Gear Box

- Bearing failure: subcomponent, rotational looseness
- Tooth wear: cracked or broken
- Gear or motor misalignment
- Eccentricity and backlash
- Bearings: high tank/supply oil temperature, lack of cooling
- Planetary gears/bearings: abnormal axial displacement

Hydraulic Accumulator

- High/low pressure

Roller

- Bearing failure: subcomponent rotational looseness, lubrication problems, cocked, high return oil temperature, oil contamination
- Oil supply to roller clogged: oil contamination, filter maintenance, leakages in the oil circuit
- Roller: high oil temperature, low oil level, high return oil temperature, high tank/supply oil temperature

The OEM expert advantage

Many providers offer to monitor your equipment, but do they truly understand your VRM? We have decades of experience installing, troubleshooting, maintaining, and optimising VRMs. 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..

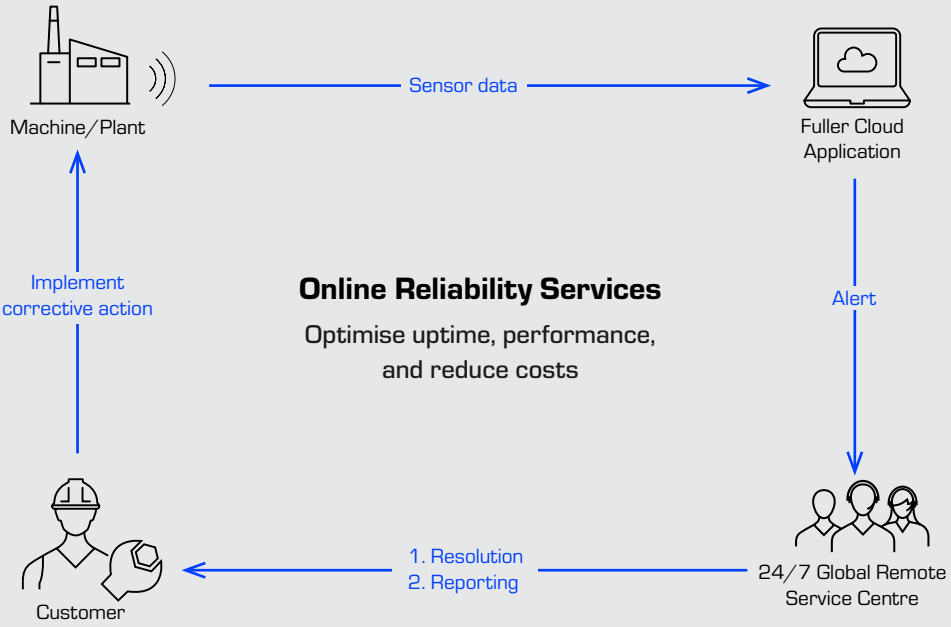
A comprehensive monitoring package

Our ORS use existing control system signals and additional monitoring systems, such as vibration, electromagnetic, ultrasonic, and oil analysis, to detect a broader range of abnormal conditions and component failures, delivering continuous insight into your VRM'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.

FULLER® TECHNOLOGIES

fuller-technologies.com

C 2-26 2000-18-ENG