Crane Health Monitoring

SMARTER MAINTENANCE. SAFER OPERATIONS.

acoem

CREATING ENVIRONMENTS OF POSSIBILITY

The high stakes of crane reliability

Cranes are vital to global industries – from ports and logistics to mines and manufacturing. Operating under extreme loads, long duty cycles, and harsh environments, their reliability is non-negotiable. Yet hidden defects in low-speed, high-load components can lead to sudden breakdowns, safety risks, and crippling financial losses.

Key barriers

Non-linear load cycles
Fluctuating loads can hide early defects.

Complex crane design
Moving gantries and booms make sensor placement difficult.

Extremely variable speed
Slow shafts produce weak signals that sensors may miss.

Environmental interference
Steel structures, salt, and dust can disrupt signal transmission.

Why reliability matters

Downtime Costs
$15,000–$50,000/hour
in loading delays

Overstay Fees
$10,000–$30,000/day
for vessels

Lost Business
$2–$3M/year
from unreliable operations

Repair Bills
$100,000+
per emergency fix

Maximising crane performance with real-time insights

With five decades of field experience, patented AI diagnostics, and proven R&D, Acoem is the trusted partner ensuring cranes operate safely, efficiently, and reliably from day one.

Acoem's edge:

Boost uptime
Minimise disruptions and maximise operational efficiency with 24/7 monitoring and early fault detection.

Cut maintenance costs by up to 30%
Reduce unplanned repairs by optimising maintenance schedules and spare parts management.

Safe and uninterrupted operations
Prevent failures and keep teams safe with real-time monitoring and maintenance.

Trusted by industry leaders for smarter, more reliable operations

Leading brands worldwide trust our expertise to keep cranes performing at their peak.

ArcelorMittal
TATA STEEL
Severstal
ADITYA BIRLA GROUP
DP WORLD
TRANSNET
ZPMC

Holistic solutions for every crane

Ports

- **STS cranes**
  Reduce loading/unloading delays by up to 25%
- **Bulk handling cranes**
  Reliable for high-capacity operations
- **Container yard cranes**
  Improve cycle times by detecting inefficiencies early.

Industrial

Improve equipment life and reduce downtime across manufacturing and construction sites.

Mines

Heavy-duty systems with reduced wear and tear under extreme conditions.

Stay one step ahead of crane failures

Cranes operate under immense stress. Hidden defects in critical, high-load zones can escalate from minor issues into catastrophic failures. Acoem's solution provides continuous monitoring of the rotating equipment and associated process parameters to detect these risks long before they lead to costly downtime, safety hazards, and major repairs.

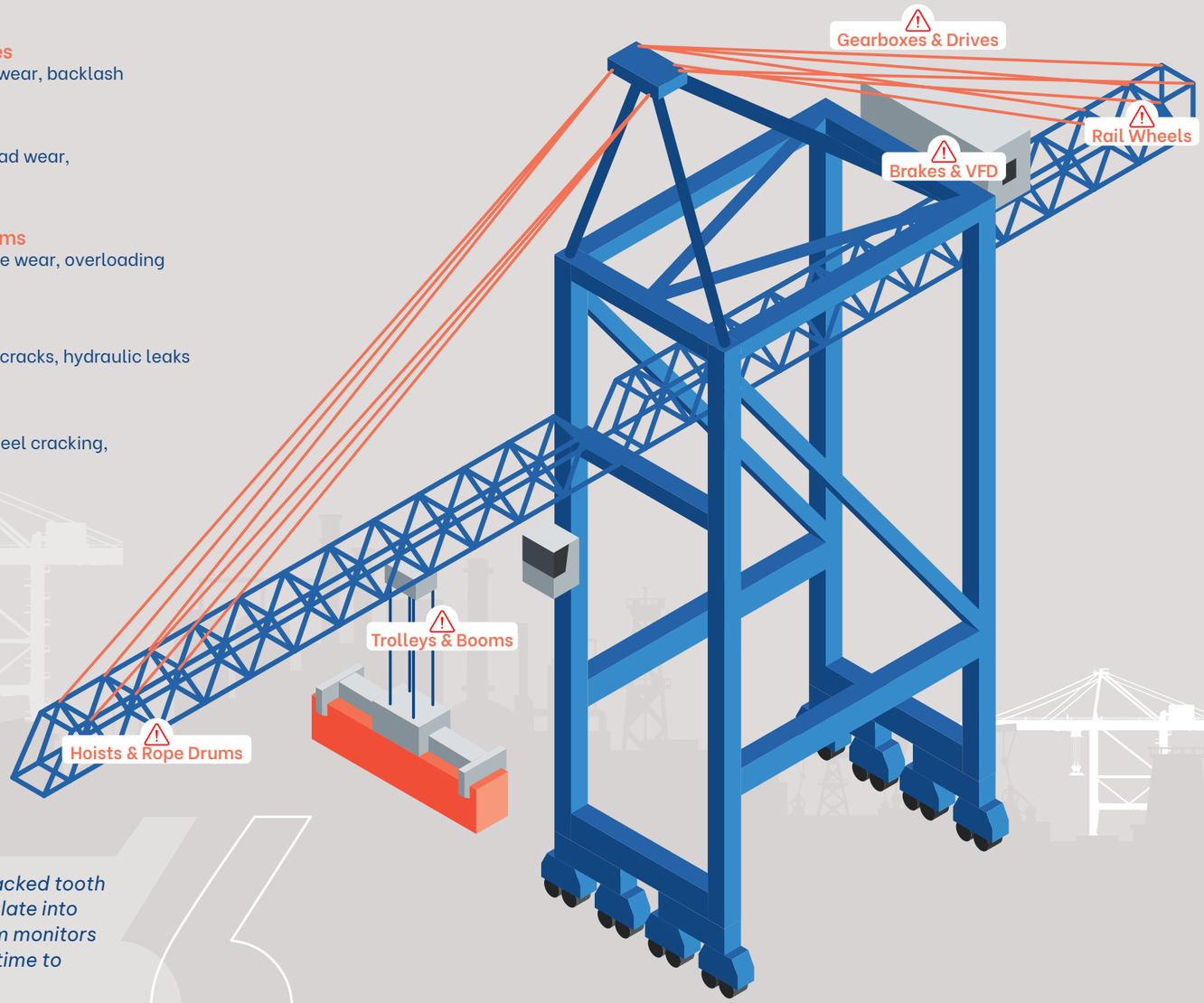
Gearboxes & Drives
Micro-pitting, gear wear, backlash

Brakes & VFD
Heat stress, brake pad wear, harmonic overload

Hoists & Rope Drums
Rope fatigue, sheave wear, overloading

Trolleys & Booms
Motor fatigue, weld cracks, hydraulic leaks

Rail wheels
Lubrication loss, wheel cracking, shock damage



Even small faults like a cracked tooth or fatigued weld can escalate into major breakdowns. Acoem monitors every critical zone in real time to prevent these failures.

Actionable insights from every component

We transform raw data into precise insights. Our patented, AI-driven diagnostics identify defects in their earliest stages, allowing you to move from reactive repairs to proactive, precision maintenance. This translates to an average 30–50% reduction in repair costs and a 5–7 year extension in component life.

Failure zone	Typical defects	What Acoem detects & prevents
Gearboxes	Cracked teeth, backlash, eccentricity	Vibration anomalies for early wear alerts
Bearings	Pitting, lubrication loss, corrosion	Shock Finder™ spots micro-faults instantly
Couplings	Misalignment, looseness	Real-time alignment trends to avoid breakdowns
Motors	Rotor bar cracks, unbalance	High resolution spectrum and envelopes for early detection
Structure	Looseness, resonances	Resonance patterns flagged before escalation

Acoem's crane monitoring solution integrates cutting-edge tools

- **Machine Condition Tracking (MCT™)**
  Real-time analysis of performance metrics like speed, power, and load cycles
- **Shock Finder™**
  Detects anomalies in low-speed components such as hoists and trolleys
- **Smart Anomaly Detection AI**
  Digital twin model enabling reliable and smart alarming
- **Multidimensional process info monitoring**
  Tracks load, stress, and operating parameters
- **MV-x edge computing**
  Microsecond-level processing delivers accurate diagnostics even under extreme load conditions.

Acoem helps you to have **eyes on every asset**

With over five decades of expertise in asset reliability, we deliver tailored solutions across sectors, ensuring optimised performance and long-term asset health.

Empower your team with tailored training

Customised programs to enhance expertise in:

- Vibration technology
- Bearing technology
- Turbo machinery alignment
- Precision maintenance

Transformative maintenance practices

We help your team adopt best practices for long-term reliability and cost-effective operations.

How real-time insights strengthen crane reliability and reduce downtime

Challenges

With more than 50 terminals worldwide, the operator needed a solution for continuous crane monitoring. The lack of an effective monitoring system exposed the company to unexpected downtime and high maintenance costs, putting global productivity at risk.

Acoem's solution

- Deployed MV-x crane monitoring system across six cranes
- Connected the system to NESTi4.0 platform via local 4G network
- Enabled real-time data visibility for proactive maintenance
- Trolley, hoist, and boom components are now continuously monitored
- Helps teams anticipate failures and optimise maintenance schedules.

Outcome

- **Increased reliability**
  Continuous diagnostics improve crane performance
- **Reduced downtime**
  Maintenance is optimised with early anomaly detection
- **Daily monitoring**
  Real-time insights ensure fast and effective interventions.

Saving 16h downtime with a single bearing fault detection

Challenges

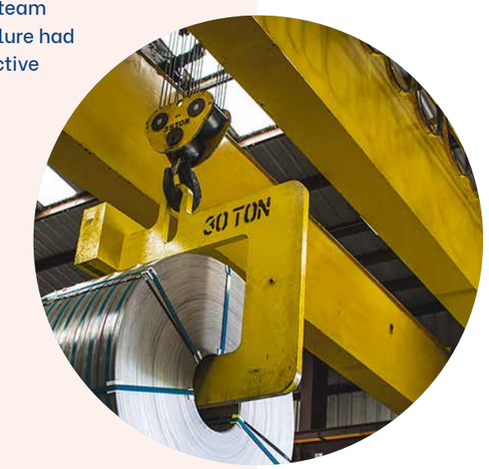
A material handling crane operating at variable speeds and with rapid directional changes generated signal noise that often masked early fault patterns. After an LT-side irregularity caused a halt, the team questioned whether any warnings had been visible or if the failure had occurred with no prior signs, affecting confidence in the predictive maintenance programme.

Acoem's solution

- Continuous vibration monitoring using the Acoem MV-x ecosystem
- Early detection of bearing defect before failure
- Provided actionable insights for proactive maintenance planning.

Impact on operations

- Crane uptime was secured by detecting bearing defect before failure
- Predictive maintenance decisions were validated with clear early-warning signals
- Operational routines improved with regular checks and short health-run verifications.



Acoem:
Your partner in industrial reliability

At Acoem, we are committed to helping organisations and public authorities find the right balance between progress and preservation. We empower industries with smarter, data-driven reliability solutions to safeguard assets, optimise performance, and ensure operational excellence. Our AI-powered monitoring systems and expertise help organisations predict, prevent, and resolve reliability challenges with confidence.

With a global presence in 50 countries and dedicated reliability centres in strategic locations worldwide, we provide localised expertise and support to keep industries running efficiently.

Reliability centres

- Australia
- Brazil
- Canada
- France
- Germany
- India
- Sweden
- Thailand
- USA
- UK

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