

SKF Railway

More Effective Maintenance of Sydney's Railway with Condition Monitoring from SKF

A long-term test of two SKF condition-monitoring solutions in Sydney's passenger rail fleet has shown encouraging results. With more knowledge about the condition of components, it is possible to move away from time- and distance-based maintenance, boosting uptime and availability.

Sydney is Australia's largest city as well as one of the nation's fastest-growing urban areas. Operated by government agency Sydney Trains, the 800-kilometre-long passenger rail network's eight core lines are used for close to 400 million rail journeys each year.

The job of maintaining the bulk of the Sydney passenger rail rolling stock is undertaken by engineering business Downer Rail & Transit Systems.

Time- and Distance-Based Maintenance

Downer has traditionally structured its maintenance programmes around time- and distance-based models. Components in the trains are replaced once they approach the end of the lifespan recommended by the OEM. However, with passenger journeys trending upwards, Frank Lukacevic, senior mechanical engineer, Downer and Christian Douglas, Downer's asset strategy manager, have been tasked with finding new ways to reduce downtime and safely extend component use.

Trial of Condition-Monitoring Systems

So, when SKF approached Downer in 2020 with two rail condition-monitoring systems that had been successfully deployed elsewhere in the world, they were naturally curious. They agreed to trial the technologies.

The first system, SKF Insight Rail, is a wireless, self-powered system for monitoring the condition of bearings in passenger rail bogies. Fitted to the axlebox, it gathers vibration and temperature data and uses a cellular data connection to send updates to a user interface.

SKF's IMx-Rail, meanwhile, is a more sophisticated, multi-channel system for the condition monitoring of a wide range of assets such as wheelset bearings, wheels, gearboxes, and traction motors. Data is continuously uploaded to the SKF cloud and analysed in a remote diagnostics centre. Customers receive alerts from the diagnostics team and can view key data through an easy-to-use interface.

Wealth of Data

After more than a year of trials, the two systems have delivered encouraging results. In particular, the Downer team has been extremely impressed with the quality of the data being delivered

by the IMx system, which, they say, has greatly broadened their knowledge of how components age and degrade.

“Acoustic trackside systems monitor wheel bearings, but we were previously blind to what was happening with the traction motors and gearbox,” says Lukacevic. “With IMx-Rail, we have been able to pick up on some gear mesh faults in our gearboxes and monitor how they have changed over time. If we learn that the fault is degrading very slowly over time, then we might gain the confidence to say in future that a gearbox can run for some time like this without action being taken.”

Track Shock Setection

As well as extremely high-quality data and analysis, another major benefit to Downer of IMx-Rail has been the shock-detection capability. Because the system is continuously taking and transmitting data, it can identify locations where track damage may be present.

“Everywhere the train goes we can map the network and identify vibration hot spots, which is something we’ve never been able to do before,” says Douglas. “In turn, we are able to go to the network operators and tell them what we’d seen. It strengthens that relationship and is quite a value-add.”

Early Fault Detection

Getting the most out of the Insight system on the Sydney network has initially been more challenging, but there has also been encouraging success. For

example, Insight successfully detected a wheel bearing fault nearly two weeks before it was detected by trackside sensors along the network.

Lukacevic says such early warning has the potential to be a powerful tool moving forward. *“Being able to pick things up earlier gives us more time to plan in maintenance,” he says. “That, in turn, means we can do the work without impacting other activities or having sets parked up and not available for service.”*

Bright Future

Both Lukacevic and Douglas agree that condition monitoring is the future of passenger rail maintenance.

“Condition-based monitoring is the future because of the benefits in terms of efficiency and competitiveness,” says Douglas. “If you’re not needing to replace components as quickly, you’re using fewer resources and less electricity and saving money and time.”

This article was first published in Evolution, the Technology Magazine from SKF.



SKF's speed and vibration sensor mounted on axlebox



SKF's advanced multilog on-line system IMx-Rail for increased rail traffic reliability

SKF®

How far do you want to take your train performance?

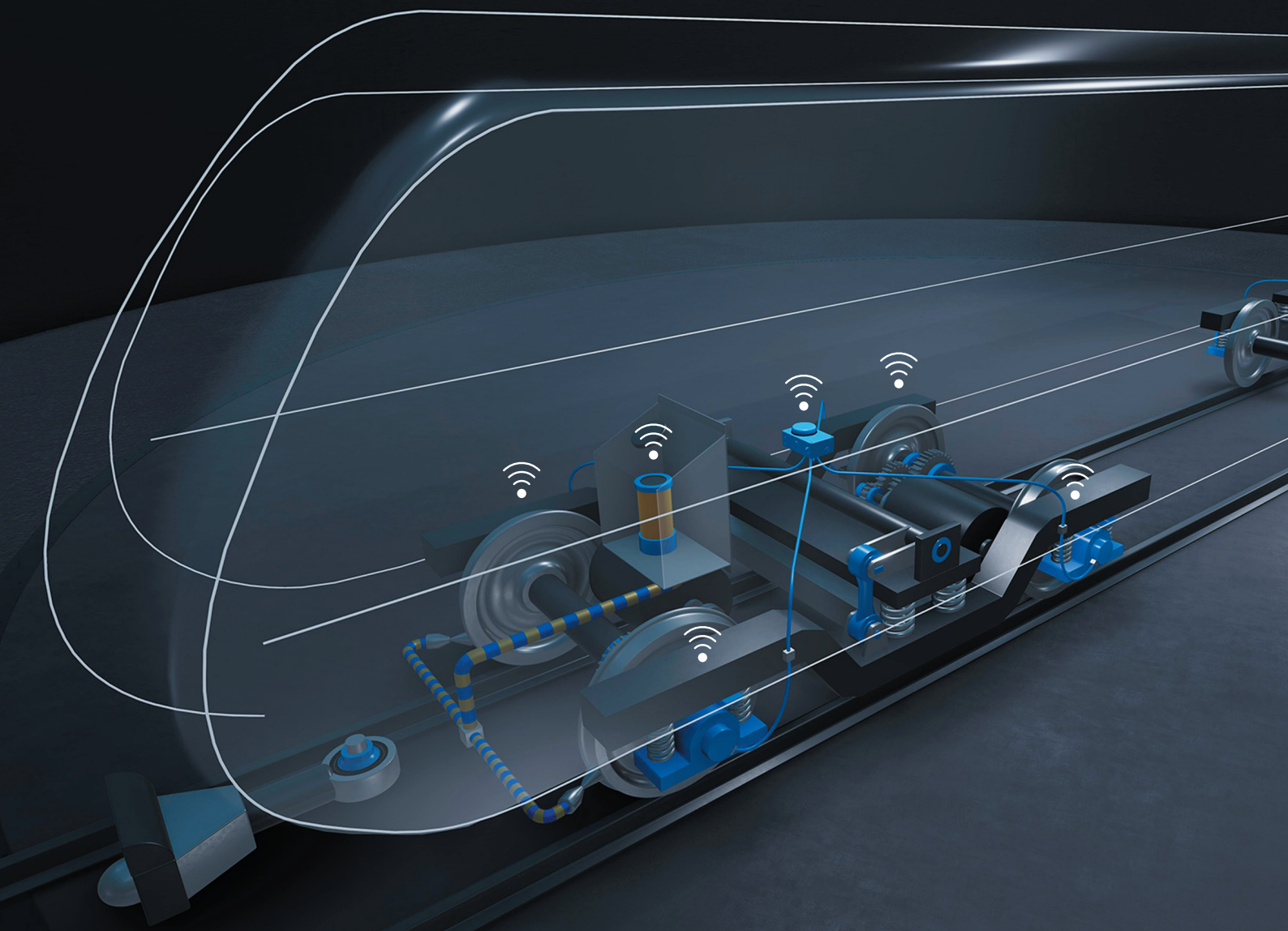
With the help of SKF solutions, you too can get the level of maintenance competitiveness, reliability, and lifecycle cost that your business demands. In a partnership with us, we examine your needs and choose a combination of technical, service and business solutions that take your train performance as far as you need.

**Click or scan the QR code
to discover our online tool
and get the performance
you need!**



Time for the next chapter.

Base your maintenance on better insights.



Maintenance protocols for rail operations are traditionally structured around fixed intervals. As components approach the end of their lifespan, they're often replaced according to the manufacturer's manual.

What if better insights into the state of your rotating equipment could help to safely run longer maintenance intervals – leveraging SKF's unique expertise?

Explore our offers in predictive maintenance and find out how the right data can help you boost uptime and performance while reducing waste and emissions.

