

**H**ow some of our engineering and manufacturing-based businesses are tapping the power of New Zealand's research base to give them that all important edge.

You've seen the image: a train track so stressed by heat it has popped out sideways, causing a curious buckle in what should be a straight railway line. It's a potentially serious hazard and one our national rail business, KiwiRail, is obviously keen to avoid.

**IN THE SEARCH FOR ANSWERS TO THIS QUESTION AND OTHERS AFFECTING ITS BUSINESS, KIWI RAIL HAS REACHED OUT TO SOME OF THE COUNTRY'S BRIGHTEST ACADEMIC MINDS THROUGH THE SERVICES OF KIWINET, OR THE KIWI INNOVATION NETWORK.**

The problem is assessing how stressed a track is, is an extremely tricky business, says Rob Whight, KiwiRail's General Manager of network engineering. "It's dependent on a really complex array of factors."

For those tracks deemed at risk, KiwiRail monitors their temperature during the day and then introduces speed restrictions if needed. "So that slows down all of our services, yet we don't actually know how much stress the track is really under," explains Whight.

In the search for answers to this question and others affecting its business, KiwiRail has reached out to some of the country's brightest academic minds through the services of KiwiNet, or the Kiwi Innovation Network.

KiwiNet is a consortium of universities, Crown research institutes and Crown entities dedicated to taking a collaborative approach to research commercialisation.

Working together, KiwiRail and KiwiNet have turned three current problems facing our national rail company - including how to non-invasively measure stress in railway tracks — into Business Challenges, which they have taken to New Zealand's research community to find some innovative answers.

The challenges were issued late last year, but the research community is already coming up with some interesting responses, says Whight.

"We've had some great ideas for all three of our challenges, some of which researchers are now progressing on our behalf.



## MAKING THE KIWI CONNECTION

Editorial Credit | KiwiNet  
Photography Credit | Andrew Hamblyn



KiwiNet has certainly come to the party in terms of bringing people together, organising conversations and giving guidance to the research establishments about the practical aspects that we are after."

Bram Smith, general manager of KiwiNet, says KiwiRail is representative of a number of companies the consortium deals with. Like many others it has good in-house capability to solve many of its own issues, but sometimes companies just need an additional innovative push from a completely different quarter or mindset to get the creative juices flowing.

### GO OUT AND GET SOME OF THOSE REALLY LEFTFIELD WAYS OF SOLVING THE PROBLEM

"What we can do with the research community through this kind of process is go out and get some of those really leftfield ways of solving the problem — things the in-house engineers would not have thought of. We're trying to help companies by introducing them to alternative ways of thinking."

The process opens a door between businesses and researchers, says Smith, which will hopefully stay ajar for a long time to come. "We are, obviously, trying to solve those core challenges for a company, but ultimately it's about building those relationships and getting companies and researchers more openly engaged.

"We're looking for companies to better understand over time how they can engage with research organisations and for research organisations and researchers to better understand how they can work with companies and how they think."

Getting science and industry talking is also the focus of KiwiNet's Foresighting events, which bring together researchers and company leaders in particular industry sectors to discuss future opportunities that may exist and explore how they might work together. So far KiwiNet has run events for precision agriculture, robotics, water management and smart buildings. The workshop-style events have resulted in a number of positive outcomes, including creating a 'cluster'-type effect, whereby participants in some sectors have continued to meet and work together as a group.

"Rather than focusing necessarily on science-push or industry-pull, it's just about getting people in a room together talking about what sort of opportunities might exist," says Smith. "Having those conversations is too often left to chance, so we're creating an environment where that chance can happen more often."

Smith cites Kiwi company Invert Robotics as a great example of what can happen when doors to such conversations open between researchers and industry.

Invert Robotics makes robotic inspection equipment — and its robots are the only ones of their kind in the world that can climb the walls of stainless steel vats. The technology is making inroads in the dairy industry, says Invert Robotics CEO James Robertson, where the robots can be used, for example, to inspect the inside of milk-drying tanks for cracks where product can potentially build up creating the risk of contamination or even an explosion. The technology offers safety, accuracy and time advantages over the traditional approach of sending a person into a tank, who then examines the interior from a scaffold or a rope.

Robertson was a student at Canterbury University when he became part of a team in an entrepreneurship competition tasked with going out to industry to find an application for climbing robot technology developed by a Canterbury researcher. Funding from the Pre-Seed Accelerator Fund (PSAF) - a government pool of money for early stage commercialisation administered by KiwiNet - later enabled Robertson and the team to flesh out some of the commercial opportunities they found..

While the team didn't end up commercialising the original robotic technology, the considerable time they spent talking to people in industry enabled them to spot an opportunity in the dairy industry that has since developed into Invert Robotics, says Robertson.

"It was this communication between industry and researchers that identified a need that we could meet. Three or four years on we've got five full-time staff and we're doing inspections each

year that are potentially saving people's lives."

And, as Smith suggests, once those relationships are established they can continue to unlock opportunities; Invert Robotics has since diversified into a specialist range of inspection equipment for cheese factories as a result of the insights and relationships Robertson and his team have gained by spending time in the dairy industry.

Many companies may be curious about somehow linking to the capabilities of a university or research institute, but with so much choice on offer it can be difficult to know where best to start, says Smith, KiwiNet provides that front door.

## IT'S ONE PHONE CALL THAT CONNECTS YOU TO A WHOLE RANGE OF DIFFERENT CAPABILITIES ACROSS NEW ZEALAND

"KiwiNet can link you up to capability around the country. It's one phone call that connects you to a whole range of different capabilities across New Zealand. Plus we have funding, resources, events; all sorts of things we can put in behind organisations to help them better connect to researchers and kick start their innovation projects."

For more about KiwiNet and to hear more KiwiNet industry stories, check out KiwiNet's seminar day on May 28th (Day 2), come and see KiwiNet and its representatives in the exhibition hall or visit [www.kiwinet.org.nz](http://www.kiwinet.org.nz)

