IRT reaps rewards from collaboration with heavy-haul railway

FOR SETTING A REMARKABLE example of the way a university can work with industry to improve our world, Monash University’s Institute of Railway Technology (IRT) recently garnered a new honour. IRT received the prestigious ‘best research and development collaboration’ award at the Business/Higher Education Round Table (BHERT) Awards for its work on instrumented revenue vehicles (IRVs), a project which is improving the efficiency and safety of heavy rail operations and thereby saving Australian businesses tens of millions of dollars.

IRT director Ravi Ravitharan was understandably pleased. “This award, along with the Clunies Ross Award that IRT researchers received in 2014, confirms Monash University’s outstanding railway engineering and technology capabilities,” he said.

BHERT is a national body, governed by leaders from the university and business sectors, whose primary goal is to strengthen ties between business and higher education, while the Clunies Ross Award is a highly prestigious accolade bestowed by the Australian Academy of Technological Sciences and Engineering (ATSE).

Part of the reason IRT was recognised with the dual awards is that IRV technology solves a long-standing problem for the railway industry. Traditionally, the condition of railway tracks has been monitored by a special track geometry car – a dedicated track-recording vehicle which requires access to busy rail corridors to make its measurements. However, using the latest technology, IRT (with its industry partners Rio Tinto, Fortescue Metals Group and Australian Rail Track Corporation) was able to overcome the limitations of track geometry cars by designing and developing a sophisticated set of algorithms and instrumentation. The instrumentation can be attached to existing revenue vehicles to automatically monitor track condition during normal operation.

With safety always a priority, leading heavy-haul railway operators with IRV technology are now more than ever able to focus on prevention rather than cure. In the 13 years that IRT has been implementing IRV technology, the program has delivered a vast amount of information about track performance and conditions, laying the groundwork for future research related to rail infrastructure maintenance. While the technology has been widely adopted by heavy-haul railways, there is still potential for instrumented revenue vehicles to be applied in other contexts, including passenger train networks, which are still exploring the potential benefits of this technology.

The information gathered by IRT’s IRVs has significantly improved operational efficiency for the organisations which have implemented it by enabling planned, effective track maintenance. Improving efficiency contributes to the railway operators’ ability to achieve challenging production growth targets. It has recently been estimated that heavy-haul railways in Australia are saving more than $100 million in operating costs annually through the implementation of IRT’s research outcomes. This is primarily due to the benefits of the IRV program, which has led to fewer derailments, no disruptions from track geometry cars, fewer unnecessary speed restrictions, higher (safe) operating loads, and more efficient and effective maintenance.

Commenting on the project, general manager of rail at Fortescue, Ron Dagostino, said: “Fortescue is proud of its partnership with IRT to deliver strategic research and development projects to ensure the safety and efficiency of its railway and maximum throughput from its operations.”

With or without the awards, the IRT is performing exceptionally well. Not only is IRT the premier railway research centre in Australia, it is also the largest institute at Monash University that is fully funded by industry, having extensive, collaborative relationships with more than 130 railway industry entities.

IRT also enjoys an international reputation for excellence in railway research, combining academic distinction with concrete, real-world solutions that are reached by an interdisciplinary team of experts. From engineers to scientists and technicians, IRT researchers are drawn from a wide range of disciplines and have the facilities to conduct everything from extensive testing to data analytics, all under one roof. It is this interdisciplinary approach which is one of the keys to IRT’s success, and the success of the IRV program.

“IRV technology is a sustainable, forward-looking, safety-focused solution for the rejuvenated railway industry and a leading example of the potential for industry and universities to collaborate on mutually beneficial projects,” Mr Ravitharan said.

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