

08/09

**ANNUAL**

**REPORT**

**GAINING SPEED**



Rail Innovation Australia Pty Ltd

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## CHAIR'S REPORT

**This is the second Annual Report for Rail Innovation Australia (RIA). The company has continued its innovative path as a start-up company and in its second year has made significant advances on existing projects and commenced new partnerships with the overriding aim of bringing technology to the rail industry for its future benefit.**

While the rail industry itself continues its revival and renewal, Rail Innovation Australia's overwhelming priority has been innovation in the development and delivery of its IP to market.

The unique OzECP brake project is the major highlight of the company's year, reaching significant milestones including the completion of product design and the delivery of some elements of the manufactured product ready for full field tests later in the year. It truly is an exciting time for the company and its partners as this project comes closer to realisation, and to the delivery of a unique new ECP product for the Australian and global brake market.

At the same time, the company with its partners has also made progress to commence work on the world-first Train Health Advisory System (THAS), the 'next-generation' monitoring and maintenance tool for the rail industry.

Our education programs have continued to break new ground, with the CQUniversity Signalling program experiencing record enrolments, and indeed all of our programs – Operations Management, Rollingstock Engineering and Railway Infrastructure – experiencing greater awareness and enrolment interest from the Australian, and international, rail market.

I would like to take this opportunity to thank our experienced Board of Directors for their ongoing commitment to the company's success. It is certainly challenging times for a start-up company, but Rail Innovation Australia is growing and developing strongly with the able guidance of our General Manager Anna Thomas and her small but talented team.

As we move into the latter part of 2009 and 2010 I would like to flag to our shareholders that we look forward to the future with much confidence and positive returns to you in the years ahead. I would also like to thank our shareholders for their continued support as the company continues its activities in the development and delivery of new products to benefit the rail industry.

I commend this report to you.

**Vince O'Rourke AM**

## GENERAL MANAGER'S REPORT

**It is my pleasure to present the second Annual Report for Rail Innovation Australia, spin-off from the CRC for Railway Engineering and Technologies or Rail CRC. The company commenced operations in November 2007, and by the end of June 2009 has been in existence for one year and eight months.**

It was a good year for the company, meeting major milestones and progressing well with the development of new products and services for the railway industry.

While the global economic downturn resulted in reduced demand for heavy haul and freight services over the last twelve months, on a positive side, it provided a window of opportunity for the railway industry to review and engage new technologies to be better prepared for the time when demand returns.

It is expected the railway industry in Australia will once again operate at the limit of network capacity in the near future. With growing demand and the uptake of ECP brake technology worldwide, the entrance of OzECP brakes onto the market early in 2010 is perfect. RIA is looking forward to its first product being delivered to the market.

The need for reduction of fuel costs and greenhouse emissions resulted in growing demand for energy saving drivers' advisory systems such as Freightmiser. In 2008-09 the product has been successfully trialled by new potential customers in Australia, Europe, Asia and Africa. RIA and TTG, jointly commercialising the product, are looking to accelerate the growth of Freightmiser's market share next year by entering into cooperation with a global manufacturer.

Pursuing the objective of delivering innovative intelligent solutions to the industry, in the reporting period RIA signed an agreement with QR, Faiveley Transport, and CQUniversity for the development of the Train Health Advisory System (THAS). The world first on-board monitoring system capable of reducing in-service failures, train and track maintenance costs, increasing network capacity and improving safety of train operation is scheduled to be completed by 2011.

Even in a period of global downturn the railway industry was experiencing skill shortages, particularly with qualified engineers and managers. RIA, in partnership with CQUni, UoW and QUT, is assigned the important task of continuing the legacy of Rail CRC in the delivery of high quality educational programs to industry. At the Rail Skills and Careers Forum held in May 2009 the Signalling, Infrastructure, Rolling Stock and Operation Management programs were recognised as a major industry educational asset. Growing student enrolments, the continuing improvement of program contents and delivery formats, and exploring and engaging new technological opportunities are aims being pursued by RIA jointly with university partners and new Industry Advisory Committees.

Strategically, RIA's links with the manufacturing sector and universities are essential for the ongoing delivery of innovative solutions to railways. The company mission is to transform research outputs and intellectual assets created by academia into tangible benefits delivered to suppliers, users, industry and economy. Delivering technologies and solutions through building partnerships and cooperative alliances is the business model adopted by RIA.

Talented, enthusiastic and committed board members and staff are an RIA competitive advantage. RIA enjoys the leadership of experienced Board members and the services of an extremely efficient business team. I would like to take this opportunity to thank the RIA Board and staff for their contribution to the company success in the completed year.

**Anna Thomas**

## Management and Board

Name	Title	Company
Mr Vince O'Rourke AM	Chairman	
Dr Anna Thomas	General Manager	
Mr Bill Hopes	Director	Independent
Prof Peter Robinson	Director	Independent
Mr John Hearsch	Director	John Hearsch Consulting Pty Ltd
Mr Brian Bock	Director	QR
Mr David Foldi	Director	Railcorp
Prof Jennelle Kyd	Director	CQUniversity
Prof Dudley Roach	Board Advisor	Independent



**RIA Board:** From left to right, Dudley Roach, Bill Hopes, Jennelle Kyd, Vince O'Rourke, David Foldi. **Absent:** Peter Robinson, John Hearsch, Brian Bock.

## COMPANY HIGHLIGHTS

### ACHIEVEMENTS

2007

November

RIA commenced operations with \$0.21 million working capital at close-down of first Rail Cooperative Research Centre (Rail CRC).

2008

March

License agreement signed transferring Rail CRC participant IP to RIA for commercialisation  
  
Grant application for THAS system submitted to Queensland Government Innovation Futures fund.

May

Collaborative agreement signed for joint venture between RIA, QR, Faiveley Transport and CQUniversity for the development of OzECP brake project.

June

Commencement of delivery of the Railway Infrastructure Program by QUT

August

\$670,000 grant secured for the development of Train Health Advisory System (THAS)  
  
First cohort graduated from UoW Rolling Stock Engineering program

November

Commencement of delivery of the new module Railway Telecommunications by CQUni in the Rail Signalling Program

December

OzECP product design completed

2009

February

Commencement of 'Rail Innovation & Knowledge Management Network' project  
  
Enrolments in CQUniversity Signalling course increased by 30% on previous year's enrolments

April

Launch of RIA postgraduate education marketing campaign

June

Collaborative agreement signed for Train Health Advisory System (THAS)  
  
Rolling Stock and Infrastructure Committees formed  
  
Train Health Advisory System (THAS) presented at the IHHA Conference in Shanghai  
  
Completion of two new modules for the Railway Infrastructure Education Program

### LOOKING TO

### THE FUTURE

August

OzECP full field tests commenced

2010

February

OzECP brakes delivered to market

2011

June

December

Education program offerings expanded internationally



## AUSTRALIAN OPERATORS FIRST

### IN LINE, BUT OZECP BRAKES

## EXPECTED TO GO GLOBAL

Within one year the project has successfully progressed from the agreed product specification for OzECP brakes in June 2008 to the manufacture and delivery of the first five working prototypes to Australia for field tests in June 2009

2008-09 has been a very busy but productive year for the OzECP project team, meeting all major development milestones. Within just a few months the development and tests of the ECP communication software and the electro pneumatic component of brakes have been completed by a joint team of engineers from Faiveley Australia and CQUniversity. The first interoperability tests were successfully completed in Australia in early June 2009.

With the installation of the first units of OzECP brakes on train and field trials scheduled for August 2009, the final product is expected to be ready for commercial sales by early 2010.

Faiveley Transport Australia has already had significant interest from a number of Australian operators expressing their desire to move to ECP technology, which allows trains to stop much more readily, getting more capacity out of the network, and overall a much greater efficiency.

Considering the OzECP product is expected to retail as a more cost-effective solution compared to ECP brake systems available on the international market, and its unique sales advantages, the project team is anticipating demand for the product will be global.

Mark Carling, Managing Director of Faiveley Australia is positive about significant market advantages of OzECP brakes.

"Firstly, the OzECP system can be more easily retro-fitted to the existing fleet."

"The second advantage is that because the pneumatic brake operation remains, if the ECP system fails at any stage, the pneumatic brake system can operate as a fall-back," he said.

For project partner and potential product user QR, the major benefits of OzECP include the lower equipment cost and a reduction in installation time due to its unique design, to suit retro-fitting coal wagon fleets.

However, QR alone will not be the sole customers in mind for the OzECP product.

Australia offers a significant ECP market, however, internationally the US is the biggest freight market, with Brazil and South Africa also key players.

It has been a long development road for OzECP, but the project is a success story of collaboration between the industry, particularly QR with their development concepts and input, academia through CQUniversity and international manufacturing company Faiveley Transport.

**'the final product is expected to be ready for commercial sales by early 2010'**



## WORLD-FIRST LOW COST

## ON-BOARD TRAIN HEALTH MONITOR

## TO BE DEVELOPED IN AUSTRALIA

**The collaborative agreement for the development of the world first train health monitoring system was signed by RIA, QR, CQUniversity and Faiveley Transport in June 2009.**

The financial and economic downturn which occurred in the reporting year was the reason for the delay and cancellation of many investment projects planned earlier by railway companies in Australia and worldwide. It also had a significant impact on the manufacturing sector, slowing down the development of new products. In these conditions, the successful negotiation of the collaborative agreement for the development of the world first train health system is indeed a great success.

**“There has been a lot of interest in the THAS project world-wide and to my knowledge we are the only people working on a multi-wagon on-board monitoring system with these capabilities.”**

The ‘next generation’ monitoring and maintenance tool for the rail industry, Rail Innovation Australia’s Train Health Advisory System (THAS) has commenced development, and is expected to be the world’s first low cost on-board train monitoring tool for multiple wagon use.

Capable of delivering significant benefits to heavy haul railways in the form of increased network capacity, improved safety and reduced maintenance costs of train and track, the THAS will be developed by a collaborative alliance of RIA, QR, CQUniversity and Faiveley Transport Australia.

Researched initially in the first Cooperative Research Centre for Rail (Rail CRC) from 2001 to 2007, the THAS involves a low cost sensor device installed on multiple wagons which communicates with a Head End Unit (HEU) via the ECP trainwire, and reports on rolling stock and track health and defect events.

Chris Bosomworth, specialist system and software engineering consultant participating in the THAS project believes it is the perfect time for development of the THAS project.

“There has been a lot of interest in the THAS project world-wide and to my knowledge we are the only people working on a multi-wagon on-board monitoring system with these capabilities.”

“There are a lot of single-wagon devices out there, but the benefit of the THAS is that it uses information from multiple devices situated along the train for a greater understanding and interpretation of train and track health.”

“We have the perfect opportunity now as we develop the OzECP brake system, to have proper input into how we interface the THAS device onto the trainwire of the ECP system to ensure an interoperable, reliable and robust product,” he said.

Designed both as an add-on to the existing OzECP brake system, being developed by the same project partners, as well as offered as a stand-alone device for interoperability with any ECP system, the THAS in its current form will report on:

- **Wheel unloading**
- **L/V risk**
- **Track degradation rates**
- **Ride quality**
- **Hunting**
- **Wheel flats, and**
- **Axle derailment.**

With the Australian heavy haul operations expected to operate at the limit of capacity in the near future, in-service failures of train may cost rail customers up to \$70-\$100 million per day in lost production. Because of this, increased safety of train operation via THAS could become a major competitive advantage for freight operators.

RIA and its partners are planning to deliver the new technology to the market in 2011.



## RIA AND TTG PARTNER

## TO ACCELERATE WORLDWIDE

## FREIGHTMISER SALES

Product trials by potential customers are underway in Australia, Asia and Europe.

RIA has progressed with negotiating a deal with a worldwide manufacturer to accelerate worldwide sales of Freightmiser.

Anticipating that economic recovery in today's climate will result in much higher fuel and energy prices, railway operators and manufacturers in Australia and overseas are moving ahead with the adoption of fuel saving technologies.

The reviews of existing driver advisory and cruise control systems completed by the European Union under the Energy Saving initiative and by the RSSB in the UK in 2009, produced comprehensive summaries of the state-of-the-art systems available and the capabilities of existing products, including the Australian-developed Freightmiser.

Product trials by potential customers in Australia, Europe and Asia were successfully undertaken in the reporting year, with positive feedback on fuel reduction and time compliance. The product provides a good platform for the development of a train cruise control system due to its ability to easily adjust train driving strategies in real-time, responding to changes in the train timetable and any other disruptions that may happen on the network. Freightmiser could form a vital part of a digital train control system delivering energy savings and ensuring punctuality of rail services.

While Freightmiser's features and capabilities are very competitive against existing products, it is difficult for the product to compete in the international market without established distribution, sales and maintenance supply

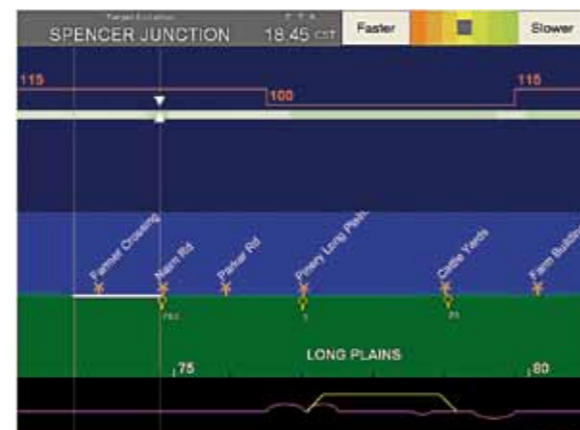
chains. Implementation and integration of the product with the locomotive cab equipment could also be improved via entering a collaborative alliance with a global manufacturer.

Securing preliminary interest from a number of potential partners early in the year, RIA and TTG have progressed with negotiations and expect to enter an agreement in the near future.

In the long term, there is also great potential to combine Freightmiser with other RIA intelligent on-board applications such as the Train Health Advisory System (THAS) and to develop a superior on-board system that will optimise fuel and energy consumption, improve safety of rail operations and reduce maintenance costs.

RIA has established close cooperation with TTG and is confident of future success of the product.

Freightmiser Main Screen



Next destination and estimated arrival time  
Speed restrictions, Freightmiser speed profile and actual train speed

Elevation profile, trackside features and the position of the train

Track curvature and crossing loops

## AUSTRALIA LEADS WORLD

### IN RAIL EDUCATION

## DEVELOPMENT AND DELIVERY



EXISTING EDUCATION MARKETS

FUTURE EDUCATION MARKETS

The number of students studying in the four RIA programs – signalling, operations management, railway infrastructure and rollingstock engineering - increased by 23% to 183 students overall during the year.

A coordinated marketing campaign of the programs was launched by RIA in 2009.

New technological opportunities for improving program delivery options are under investigation by RIA and partner universities.

The rail industry's critical dilemma, the world-wide rail skills shortage has been addressed to a greater degree this year as Rail Innovation Australia and its licensee partners grow enrolments in their four world-first rail-specific postgraduate courses, targeting both the domestic and international rail markets.

Enrolments in the postgraduate Railway Signalling and Rail Operations Management via CQUniversity; Civil Infrastructure via Queensland University of Technology and Rolling Stock Engineering courses via University of Wollongong have steadily increased as industry awareness grows.

RIA is looking forward to engaging with the new Industry Advisory Committees for the Rolling Stock and the Infrastructure Programs formed in 2009 to improve the value of educational services for the railway industry and continuing to work with the IRSE Education Committee and existing Operations Management committees for the ongoing development of rail professionals.

At the commencement of the Summer 2009 session, CQUniversity had received a record enrolment of 101 students in its Railway Signalling & Telecommunication course adding to the 67 who have already completed the course since its commencement in 2004.

The Operations Management course took on 33 students in 2009, the Railway Infrastructure welcomed 28 students and the Rolling Stock Engineering course commenced with 21 students in two offered subjects.

In the reporting year, Rail Innovation Australia and its partner universities were investigating technologies for online delivery of lectures to improve delivery-mode options and enhance understanding of the material by students to ensure a greater take-up of continuing professional education in the rail industry. The replacement of face to face workshops with online delivery options would ensure greater opportunities for RIA programs in the international market.

To be sustainable, the educational programs should continue to expand their market in Australia and worldwide, and the completed year was an important step for RIA in pursuing its vision and strategy for the programs to become global.

**RAIL INNOVATION NETWORK:**

**FROM AN INNOVATIVE CONCEPT**

**TO A PILOT PROJECT**

**Knowledge management network prototype developed.**

It has been recognised that innovation and knowledge are among the most important factors of competitiveness of any organisation. However, effective knowledge management has always been a challenging task because of the mobility of the industry workforce and limited corporate budgets available for this purpose.

While Rail Innovation Australia's four educational programs already assist industry with skill shortages, there are tremendous opportunities for engineers and managers to learn informally via networking with other professionals. Unfortunately, existing social networks are yet to deliver benefits to business organisations for a number of reasons. In contrast to social networks like LinkedIn or Facebook, Rail Innovation Network has been designed as a convenient networking and knowledge management tool that could be customised to suit the needs of both organisations and their employees.

In the reporting year the company has finalised the concept and progressed with building a pilot project and a test bed. The universities and industry organisations participating in the delivery of RIA educational programs will be invited to 'pilot' the concept and assess the benefits from the Network.

**RIA LOOKING**

**TO THE FUTURE**

It has been another exciting year for Rail Innovation Australia and the company is looking forward to its efforts coming to fruition.

With OzECP brakes sales commencing in early 2010 and the delivery of the Train Health Advisory System in 2011, the company is confident of delivering value to customers and dividends to shareholders in the near future.

Achieving international recognition and growing the worldwide market for the educational programs is another milestone the company is looking to achieve within the next two years.

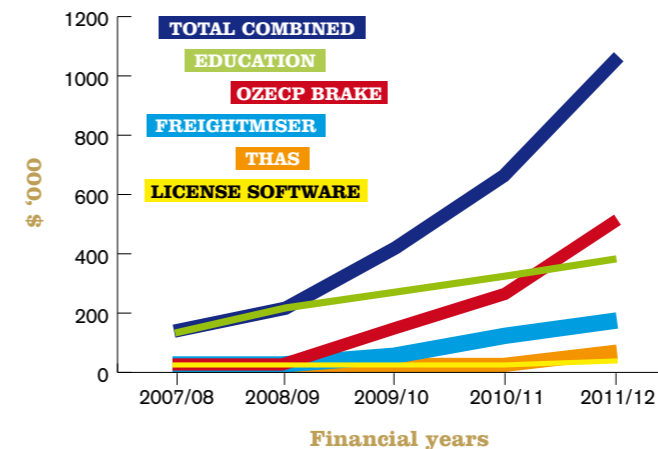
Problems and challenges confronting the railway industry that may be addressed by new technologies, products or services are sources of opportunities for Rail Innovation Australia. Delivering new products and solutions for the railway industry via a cooperative approach is the strategy adopted by the company so far. There are currently a number of opportunities under review and development, where RIA is looking to build cooperative projects with partner organisations which are capable of delivering targeted solutions for the rail industry.

As an example, the mesh communication technology developed by the University of Wollongong is a highly reliable low cost communication platform that could be used for the development of a low cost level crossing system. However, the technology is only part of the solution. Close cooperation between parties across the technology supply chain is required to develop a market product and RIA is focusing its efforts on building the right partnerships.

Gaining speed, Rail Innovation Australia is continuing to grow its product portfolio, pursuing the challenging mission of operating a successful spin-off company.

Gaining speed, Rail Innovation Australia is continuing to grow its product portfolio, pursuing the challenging mission of operating a successful spin-off company.

**Projected income from commercialisation**



## RIA RECOGNISES

### INDUSTRY PARTNERS

Rail Innovation Australia has successfully completed its second year of operation, with proven accomplishments as a start-up company working in the fields of development and commercialization, and rail education.

In rail education particularly, the company wishes to acknowledge and recognise the commitment and efforts of the rail industry in growing, reviewing and delivering the rail education IP and products delivered through QUT, UoW and CQUniversity.

RIA and its university partners acknowledge the following groups and individuals:

#### IRSE Signalling & Telecommunications Advisory Committee (CQUni)

Name	Company
Les Brearley	Ansaldo
Glenn Miller	Department of Transport Victoria
Paul Scaszvay	RailCorp
Sandra Karrasch	QR
Steve Boshier	Westinghouse Rail Systems Australia
Peter Symons	Country VP IRSE
John Aitkens	2009-2010 Chair of IRSE

#### Railway Infrastructure Advisory Committee (QUT)

Name	Company
John Powell (nominated Chair)	QR Network
Brian Hagaman	QR
Jeff Stead	RailCorp
Nathan Farr	ARTC
Brian Marsden	WorleyParsons
Greg Stephens	Department of Transport Victoria
Warwick Kinscher	Vossloh Switch Systems/RTAA

#### Rolling Stock Engineering Advisory Committee (UoW)

Name	Company
Ian Rossow	Independent Chair
John Phelan	QR Limited
Jim Griffiths	ARG
Brian Hastings	Interfleet
Todd Garvey	Bombardier Transportation Pty Ltd
Steven Bartlett	United Group Rail
Danny Broad	Downer EDI Rail
Henry Mooser	WorleyParsons Rail
Graham Cowan	WorleyParsons Rail
Barry Lovat	RailCorp
Henry Ratzlaff	Siemens Ltd Australia

#### Rail Operation Management Advisory Committee (CQUni)

Name	Company
Kevin Wright	QR
Loretta Daugalis	RailCorp
Tania Davies	Rail Skills Careers Council (ARA)
Cassandra Parisotto	QR
Kim Barkel	RailCorp
David McMahan	QR
Neil Backer	QR
Megan Farrell	RailCorp
Vivienne King	RailCorp
Kevin Lohan	RailCorp
Geoff Arthur	V/Line



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