

SYDNEY NEWSLETTER



Railway Technical Society of Australasia
Sydney Chapter
PO Box 138, (118 Alfred St)
Milsons Point, NSW 1565

OCTOBER 2005

MEETINGS

NEXT MEETING

Thursday 6th October

**17.30 for refreshments prior to the
Presentation at 18.00**

**HARRICKS AUDITORIUM, ENGINEERS
AUST, 118 ALFRED ST, MILSONS POINT
(200 m north from station)**

An Australian Englishman Reports on Modern Japanese Trains

Ian Mash, Senior Consultant, Interfleet Technology, took part in the Institution of Mechanical Engineers summer technical visit to Japan in May 2005 (their summer, not ours).

Japan was the first country to introduce high speed trains, opening the initial Shinkansen just over 50 years ago, and has been in the forefront of passenger train development even since. Come and find out more about some of the amazing things that can be done on rail when Ian gives us a presentation on this interesting subject. 17.30 start for nibbles before the presentation at 18.00.



LAST MEETING

On Thursday September 1st, David Hill, two times former CEO of State Rail and now Chairman of Rail Heritage Australia (NSW), spoke on 'The Future of Rail Heritage in NSW'.

David spoke of the forthcoming events to celebrate the 150th anniversary of the running of the first train to Parramatta on 26 September 1855. He outlined many events that he encountered during his reign as CEO and covered some historical aspects of the initial Sydney Railway Company.

David gave us a fascinating insight into the condition of rail heritage in NSW, and was able to give the audience some confidence that rail heritage issues are not being overlooked by the 'powers that be'.

It was most interesting to note the large number of rail heritage sites and activities in NSW, and that the large majority of them fall under the umbrella of Rail Heritage Australia (NSW). This organisation, while only able to provide limited funding support (hardly surprisingly), is also commissioned to assist the various groups with management and long term planning. It would seem that, under David's leadership rail heritage in NSW does indeed have a future.

The restoration of locomotives and rollingstock along with the need to retain our industrial heritage ensured a lengthy question period at the conclusion of his presentation.

The meeting was attended by a substantial number of members and visitors, who were left wondering how many wagons indeed are still rusting at the bottom of Darling Harbour!!

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EDITORIAL INTRODUCTION

This is the first Sydney Newsletter which it is hoped will become a regular means of keeping members of RTSA here informed of events past and future, as well as hopefully keeping them aware of some of the issues facing our industry through regular commentary pieces.

For some years I edited the South Australian Newsletter, until late last year when I moved to Sydney. I have now volunteered to start and edit a similar Newsletter here. Hopefully I haven't taken on more than I can handle (I still need to earn a quid) and that is where you, the membership, can come in.

I have been in the rail industry for ever, but even earlier than that I still have clear memories of coming down from Canberra to Sydney in 1955 (by the very slow but more frequent train service that then prevailed) to see the railway centenary display – an event that had some influence in determining a course to a long life in this industry. I have a strong belief that being in an industry is not enough – there really needs to be something of a passion for what you are in and what you do. The days of holding out your hand every second Thursday are long gone. Nowadays the numbers of participants are much lower than 50 years ago but the function of those people is much more significant. There is no room for passengers and drifters within the industry in such a situation; else the competition (for business, for political attention, for public acclaim and so on) will simply swallow us up. Having a job in an irrelevant and unsurvivable industry is not a happy place to be, even less so if your participation is indirectly contributing to that state of affairs.

I have been in the habit of penning editorial pieces for the S.A. Newsletter and intend to continue that in this edition. Most of these are in the nature of commentary pieces which are intended to inform and challenge – they will not look like the average media or spin doctor stuff that so often passes as good reporting these days. My commentary pieces (although anyone is welcome to contribute) tend to focus on various issues that are either '*light on the hill*' stuff, or are '*we can't go on like this*' stuff – key concepts behind them include survival, long term, strategic, customer, core purpose, efficiency and innovation.

I am not very tolerant of things that I feel are counter-productive, indifferent or just plain incompetent within the industry; the type of things that internally threaten the industry for which I have a passion. In writing on some topics no doubt there will be the occasional

offence taken by someone (but I am still here on the free side of the bars so it can't happen too often☺). While offence is not intended, it is equally sure I am not all that interested in debating history (unless there is some way of going back and doing it all again) but rather I am interested in the future. So if you want to join in please feel free to do so but remember that a creative alternative proposition is always a lot more welcome than an attempt to re-interpret the past.

Having laid down the 'stern words' part of this introduction it remains to be said that this Newsletter is intended to interest, challenge, inform, educate and entertain members, an objective that can best be done by participation. So if you know of something, have something to say, are involved in interesting projects or work, or anything else that is appropriate to RTSA then please feel free to contribute. Contact details are to be found at the end of this (and every) Newsletter.

Now read on -

THE OBSERVATION POST

Airbus, the No. 1 manufacturer of commercial airliners these days, has a by-line in its recent advertising - "Non-stop innovation is the only way we know". A catchy concept and probably not far from reality. A separate piece of paper has also come in with advice that the Eureka Prize for Leadership in Business Innovation has gone to Dick Davies of AMIRA. Who and what you might say. Well Dick transformed AMIRA (Australian Mineral Industries Research Association) from a non-profit industry based national research broker, which was being overtaken by globalisation, into the international arena by harnessing the best of Australian research talent along with those from twenty other countries. AMIRA International is now a leader in international collaborative minerals research and has something like \$45 million invested in 60 world-wide research projects.

The common thread through both these stories is that of innovation and research. What is not stated but is self evident is that there must be vision if there is to be advancement, and that will need among other aspects a dedication to the longer term but quite fundamental things that can only come from research and development.

Brian Bock of QR is quoted as having pushed the line at the recent Heavy Haul conference that there is a need for vision that is not bounded by the past and that will take us forward faster than if we take the comfort zone

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approach of small steps at a time. Bock pointed to the 45 projects being undertaken by the CRC's as evidence of the research effort currently under way in this country as one part of fostering a 'vision'. At the same conference Roy Allen of the Transportation Technology Centre Inc (TTCI) in the USA raised what he sees as fundamental, but not forefront, issues such as that of capacity which will need to be significantly advanced within the next decade or so. An issue in search of vision.

The reported message coming from the conference was one that dedicated heavy haul railways are putting in a lot of effort to push the technological boundaries, but there is a much wider need to invest in research and development if railways, and therefore the rail industries, are to move ahead (or the current climate even just keep up with the competition). The conventional main-line railways in this country, although now rather fragmented horizontally and / or vertically, do not appear to be putting much effort into long term futures. There have been a couple of well documented ventures that with hindsight were little more than asset stripping exercises; others which thrive, but more from acquisition and compaction of the industry rather than from innovation and vision. There are several large investment rail projects running at the moment but some of these at least seem to be enmeshed in poor planning and even worse political advice, promising almost the antithesis of what they were supposed to achieve.

However there are some interesting developments which to my mind are illustrative of the innovative solutions that are implicit in the earlier Heavy Haul comments.

Exhibit 1: The QRN Hunter Valley coal trains which have introduced 30 tonne axle load locomotives for the first time outside the Pilbara (90 class are 27.8 tal), a.c. traction on locomotives for the first time on standard gauge outside the Pilbara, electronically controlled pneumatic braking (ECP) for the first time on freight trains, and lighter tare higher capacity wagons that remain within the 30 tonne axle load limit. It is of note that the other coal haul company is importing wagons that have a tare weight approximately 3 tonnes heavier than the locally built QRN wagons, which will cost the equivalent of around 300,000 litres of additional fuel per year just to move the higher dead weight.

Exhibit 2: The proposal to create passing lanes south of Junee on the single track section of the Sydney – Melbourne route. This proposal has come from considerable analysis and research into elapsed freight train times on this corridor, a key factor of which was the

choking effect of traffic growth as long as conventional crossing loops are employed. The solution adopted, to create very long crossing loops (or short sections of double track depending on your point of view), is planned to enable efficient operation of a number of patterns of freight traffic (peaked or evenly spread) under conditions of substantial growth with little if any degradation of achievable transit times. This innovation should in fact set up the Sydney – Melbourne corridor with ample capacity for growth and just as importantly sufficient cushion to allow further capacity expansion prior to the need becoming a reality.

Australian railways have come a long way from the days not all that long ago when conservative traditionalism was able to rule with few untoward effects on the business (apart from leaving us in the 21st century with a legacy of under-investment and a conservative heritage to look back to). However times have changed and the need nowadays is more toward the ideal of 'non-stop innovation' if we are to remain and grow as part of a relevant land transport scene. Research and development is a key part of fuelling the fires of innovation.

ON THE HORIZON

The **AusRAIL PLUS 2005** conference (and attendant exhibition) will be on again at the Sydney Convention and Exhibition Centre, which if you are like me and somewhat confused by all the 'Sydney xxx Centres', is at Darling Harbour. The dates are Tuesday 22nd to Thursday 24th of November. The first two days will be taken up with a combination of plenary and technical sessions under the auspices of ARA, RTSA, ARIC, IRSE and RTAA while the third day will be all ARA. Details can be found at www.ausrail.com

The **CORE 2006** conference planning is charging ahead toward the dates of 30th April - 3rd May 2006. The venue is at the Melbourne Grand Hyatt which is up at the Paris end of Collins St (how come the Paris end of town is full of high rise buildings when Paris is all four or five story Napoleonic buildings?). Details can be found at www.core2006.org and registrations are now open.

ECP BRAKING – A LEAP FORWARD?

Conventional air braking has developed over the 130 years or so since George Westinghouse perfected the freight air brake. Improved technology and materials have allowed refinement of the application and holding capabilities of the air brake, but that has not really

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changed the basic concept of air pressure changes applying and releasing compressed air brakes along the length of a train. The air brake is robust, reliable and almost universal in its application to railway braking these days.

A major shortcoming of the conventional head-end air brake is the time taken for the air pressure wave to run the length of a long thin train pipe on a long train. Even with the modest length 1500 metre trains now running on the east coast there is a build up time of up to 60 seconds before the full brake is actually applied along the length of the train. In that time the train has run maybe as far again as it will take to stop the train once the brakes are fully applied – in other words the train stopping distance can be double or more than if the brakes were able to be immediately applied over the full length of the train. Distributed power and end of train monitors with air dump capability are partial solutions. The good news is that there is a whole solution, and QRN have taken a lead in its introduction to this country.

QRN have fitted Electronically Controlled Pneumatic braking (ECP braking) to their new Hunter Valley coal trains. This braking is still operated by air but is activated electronically using a 230v dc bus line along the train. It enables all brakes on the train to be applied at the same time and the only delay (of a few seconds) is due to the time for the appropriate pressure to be admitted to the brake cylinder from the auxiliary reservoir on each wagon (in fact they are in pairs so one control valve does two wagons). This system not only allows infinitely graduated application of brakes but also allow graduated partial release, something that cannot be done with normal air brakes. In fact the train line is always at full pressure and when the brakes are applied, consuming some air, it will recharge straight away regardless of the amount or duration of the brake application. A full service ECP brake application and release on a mid length train (say 75 wagons) can be achieved in less time than the brake build up time on a conventionally braked train.

The ECP system however is far more capable than just dealing with braking precision. Since the train is electrically coupled it can handle a number of data tasks as well as other (future) tasks such as control of distributed power in trains (QR has a 30 year history of using distributed power so they see that type of operation as entirely normal). ECP requires identification of the front and back of trains, which enables continuous (brake) health monitoring of every wagon and allows continuity, retention and other tests to be done from the driver's station. It also gives the driver

the actual wagon numbers on the train and their condition (loaded or empty). The end of train device reports end of train pressure, voltage and motion sensing data, while also providing a high intensity LED end of train marker light. Additional (wagon) health and status data could be generated on each wagon, although any reasonable additional data load may have to be carried by an extra pair of train wires which would need to be built in from the beginning to be cost effective. AAR tests indicate that ECP can save 60 minutes for every 600 km of travel (simply as a result of greater precision in braking) while they also estimate a 25% reduction in derailments arising from in train forces (ECP substantially reduces in train forces at application and release of brakes). Despite this the application of ECP to normal commercial freight operations at this stage is more or less limited to Canada, South Africa and now Australia.

QR prototyped ECP on a trial train set from the Callemondah narrow gauge coal fleet starting around 2003. A number of issues came up that were able to be resolved in time for the Hunter trains – in fact it is expected that as a result of QR and CRC work an Australianised ECP capable of retrofit to existing wagons and able to inter-work with air braked wagons may be developed.

QR adopted 30 tonne axle load locomotives with a.c. high adhesion traction for their Hunter Valley operations. This has allowed them to haul 74 wagon trains (8880 tonnes loaded) with two locomotives. The time they loose on upgrades compared to PNL two loco, 60 wagon trains (due to more tonnes but similar power) is made up by more precise and aggressive braking using ECP braking gear on the level and downhill sections. In fact technically there is no reason why the QR coal trains could not run at 80 km/h safely with existing signals, other than the fact that they would catch up to the existing 60 km/h air braked train ahead. In terms of braking in this country it may not be unreasonable to suggest that ECP braking for freight trains may be the biggest single step forward since the adoption of the air brake in the 19th century.

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NOTICEBOARD

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CONTRIBUTIONS TO THE SYDNEY NEWSLETTER

Part of the function of RTSA is to keep members in touch with what is going on in the industry and with each other and to that end we are only too happy to publish items of interest. Articles or editorial comment for Newsletter are very welcome. We have several hundred members locally some of whom must have stories, events or developments of interest that could make an interesting item for Sydney Newsletter.

Send copy to the Editor, Max Michell, by e-mail to samrom@bigpond.com, phone 02 n9241 2675 or post to 806/129 Harrington St., The Rocks, NSW, 2000.

For all other matters relating to RTSA Sydney Chapter contact Basil Hancock (Secretary) or Bill Laidlaw (Chairman) as above.

NOTICE TO MEMBERS RECEIVING RTSA NEWSLETTER BY EMAIL

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Version 6 of Adobe Acrobat Reader may be downloaded free of charge from the internet at www.adobe.com. Alternatively, Adobe Acrobat Reader 6 is generally included on the CD ROM attached to most computer magazines.

CPD CREDITS

Members who attend RTSA meetings and events will qualify for CPD credits as per the Engineers Australia criteria. Members are responsible for recording their own CPD for audit.

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