SYDNEY NEWSLETTER

Railway Technical Society of Australasia
Sydney Chapter
Mail: PO Box 6238, Kingston, ACT, 2604

MAY 2007

NEXT RTSA NSW CHAPTER MEETING

Thursday 7th JUNE

17.30 nibbles and networking for an 18.00 presentation to be held at our venue –

GROUND FLOOR AUDITORIUM, INST. OF ENGINEERS,

8 THOMAS St, CHATSWOOD (WEST SIDE OF CHATSWOOD STATION)

A speaker from
Air International Transit will give a presentation on
Air Conditioning in the railway industry.

This company supplies air conditioning equipment
to the following industries:
Road
Rail
Defence
Mining

Come and find out about the challenges of fitting air-conditioning equipment into the confined spaces of the railway environment and providing a comfortable environment for crews and passengers.

http://www.aitransit.com/rail.html

Complimentary nibbles and networking from 17.30 prior to the presentation starting at 18.00.

Why not come along to an RTSA meeting (where you will be most welcome) and broaden your horizons in the industry that employs you and/or that you are keen to support. Even better consider joining RTSA (you do not have to be an engineer to be a member) and enjoy the full range of services provided by the association. Contact is at the mail address (above) or at www.rtsa.com.au or by ringing Bill Laidlaw on 0409 602 833

SYDNEY NEWSLETTER

Railway Technical Society of Australasia
Sydney Chapter
Mail: PO Box 6238, Kingston, ACT, 2604

MAY 2007

FUTURE MEETINGS

The following meetings are planned for the remainder of 2007. We always despatch a newsletter, or in extreme situations a flyer, prior to every meeting. In most cases the next couple of months are firm while those further out are provisional.
Anyone with inspiration or bright ideas for future meetings should contact Bill Laidlaw at billlaid@bigpond.net.au

Tue 3rd JULY at Central: AGM and tba

Tue 7th AUGUST at Central: tba

Thur 23rd AUGUST at city location: joint RTSA / PWI / IRSE meeting, with a speaker arranged by PWI.

Wed 5th SEPTEMBER at Central: tba

Wed 3rd OCTOBER at Central: tba

Wed 7th NOVEMBER at Central: provisionally Downer EDI on the subject of 25kVA electrification as practiced in Queensland and Western Australia.

There will be no meeting in December since the normal date would clash with the AusRAIL 2007 conference, which returns to Sydney this year.

MEETING VENUE

As advised in the April Newsletter there are to be changes to the times, days and location of our meetings. The venue at Chatswood has turned out to be a bit off the beaten track so it has been decided that from July we will trial lunch time meetings in a room located off the main concourse at Sydney Terminal Station. This is accessed from the Sydney Terminal concourse, in the North West corner (underneath the clock tower). With this will come a change of 'normal' date to the first Wednesday of the month, although the first two such meetings (July and August) will in fact be on a Tuesday due to prior booking of the meeting room on our desired date.

It is anticipated that the meetings will be 11.30 for a 12.00 or 12.15 presentation with finish time no later than 13.30. The usual refreshments will be provided, although they may be adapted to the new (lunch) time and the need for attendees to return to their offices afterwards ready for another 4 hours of hard labour.

Details of how to find the new meeting room will be given in the next Newsletter along with the usual front page 'banner headline' of what to expect.

COMING EVENTS

NOTICE OF ANNUAL GENERAL MEETING

All RTSA (NSW Chapter) positions will be declared vacant at the AGM to be held on 3rd July 2007. Nominations are sought from RTSA members for the following positions:

- Chairman
- Secretary
- Newsletter editor
- Committee Member (eight positions).

AusRAIL Plus 2007 will be back at the usual Darling Harbour location in Sydney from 4th to 6th December 2007.

CORE 2008 will be held in Perth between 7th and 10th September 2008. Themes will be around high volume bulk freight and the integration of rail as part of the export supply chain, and rail in an urban environment and the issues of integrated planning of land use and transport as the core of successful public transport. Register your interest by going to www.CORE2008.org

SYDNEY NEWSLETTER

ENGINEERS AUSTRALIA
RTSA

Railway Technical Society of Australasia
Sydney Chapter
Mail: PO Box 6238, Kingston, ACT, 2604

MAY 2007

LAST MEETING

HARDFACE TECHNOLOGYS

Presentation by Mr Shamus Walsh of Hardface Technologys.

Introduction

Rails and crossings are in fact consumables, albeit a long-lasting ones.

The company has been involved with Rail Head Repair for eight years, based in Penrith NSW. It has from 6 to 26 workers, because of the irregular demand for their services. The company also repairs ground-engagement tools (ie, Bucket Teeth) for heavy mining machinery. These items can weight up to 200kg each and are also amenable to the same repair techniques.

Faults in Railway Crossing Components.

- Mushroom-type deformation on stock rails, wing rails and nose of turnouts.
- Broken tips on switch blades.
- Cracking, leading to loss of metal from noses of crossing frogs.

Rail is often left in place and allowed to wear to the point where excessive noise, vibration and severe impacts require their removal.
The speaker pointed out that they should be repaired before deteriorating to that extent.

Manganese Steel alloy is wear-resistant and is less prone to cracking than other grades of steel. However, Manganese steel castings often have casting defects. The replacement weld metal, as repaired by companies such as Hardface Technologys, is claimed by the speaker to be better than the original material, because of the lack of such defects.

Post-installation grinding is very important. It should be ground after it work-hardens from the action of traffic passing over it. Follow up grinding and monitoring is very important. The grinding and restoration of the original profile is a highly skilled occupation.

Explosive hardening – a technique used on manganese steel crossings, to harden the running surface prior to installation. This procedure is not normally applied to the tip section of the nose of the crossing.

Some of the BHP Steel Railways have 60t axle loads (ie, torpedo wagons for molten steel), which can cause accelerated wear despite the low speeds.

Rail Bound Manganese Insert Crossings ('RBM's)

These are commonly seen in the Hunter Valley. The Frog is basically an assembly of two diverging rails fastened to a triangular austenitic-manganese steel insert. The insert cannot be welded to normal rail. A skilled crew can dismantle such a crossing and replace the manganese element in a two-hour shutdown.

Three of the RBM elements can be carried inside a normal utility vehicle, to be taken back to the Hardface Technologys workshop to be reconditioned to good-as-new condition. Six or seven such repairs can be done before the item should be scrapped. There are savings from this approach (rather than purchasing seven new castings).

Mono-Bloc and Manganese Nose crossings will take longer to replace than RBM type crossings. The speaker recommended that manganese crossing elements should not repaired in-track, except in emergencies.

Restoration work on a RBM element typically takes 3 days (grinding plus welding). There is a proprietary method to control the temperature. (The presence of moisture from water-cooling would be harmful for the weld quality of the repaired product.)

SYDNEY NEWSLETTER

ENGINEERS AUSTRALIA
RTSA

Railway Technical Society of Australasia
Sydney Chapter
Mail: PO Box 6238, Kingston, ACT, 2604

MAY 2007

Monitoring and crack-testing are important tasks for those who manage railway turnouts.

Arc Welding of Rail Joints

The speaker claimed that Arc Welding produces a superior result to aluminothermic Welding. At present in Australia the arc-welding process is done for Crane Rail, but not yet for conventional rail.

Rails will sometimes break at the Heat Affected Zone of the aluminothermic Weld. The aluminothermic weld metal is also softer than the parent metal of the rail.

For Arc Welding, pre-heat temperatures are typically 350^{o}C (not 900^{o}C as in the aluminothermic welding process). In Europe robotic arc welding machines are often used for Rail Head Repairs. (For example, Danish State Railways has approximately, fifty welding robots, costing $30K each.) The repaired welds using this process should perform better than the parent rail itself particularly when welding manganese.

Welds need to be ultrasonically tested. There are also other crack-detection techniques (magnetic particle, dye penetrant, etc).

Rail Head Repairs

Wheel Burns on rails can be repaired in about two hours, depending on the severity of the defect. Head Hardened Rail is more difficult to repair and requires a slightly different procedure. All rail rectification work is noisy (involving much grinding with power tools and generators). Typically lineside residents need to be notified of such work in advance.

If the work is done properly, the repaired product should be such that the original fault is no longer visible or detectable. (Need a reference paint mark a metre or so away, so that the location of the original defect can be monitored after the repair.)

Other rail faults that can be repaired

- Dropped Rail Ends
- Mis-matching rail ends.

Occupational Health and Safety

Workers should wear suitable masks when grinding, to avoid breathing dust containing manganese.

Warranties from Hardface Technologys.

Repaired track components are certified defect-free, and to the correct profile. They are given QA testing by a third party. They will last in-track for a certain period of time, depending on the tonnage handled.

For the Hunter Valley coal traffic, crossing components lasting six months in traffic is well regarded. For lines in the Pilbara, which have higher annual tonnages and heavier axle loads, the life expectancy can be somewhat shorter.

Award for Hardface Technologys

The work being conducted by Hardface Technologys in leading the way in Rail Head Repair Technology has resulted in Hardface Technologys receiving an award. The Welding Technology Institute of Australia (WTIA) has selected Hardface Technologys as the winner of the Fabricator of the Year award (2006) in the small company category. A ceremony, where the award will be presented, will be held on Wednesday 23rd May at the National Manufacturing Week Exhibition in Melbourne.

Conclusion

Andrew McKay gave a Vote of Thanks to the speaker for a most informative presentation, with many illustrations of repair work around Australia.

SYDNEY NEWSLETTER

ENGINEERS AUSTRALIA
RTSA

Railway Technical Society of Australasia
Sydney Chapter
Mail: PO Box 6238, Kingston, ACT, 2604

MAY 2007

THE OBSERVATION POST

My local railway line in Sydney is probably unique in this country. It has only three stations and is only around 6 kms long but supports an off peak train frequency of 10 minutes (and peak between 3 and 6 minutes) with 8 car double deck trains that seat 900 or so people. I refer of course to the Eastern Suburbs line that links Bondi Junction, Edgecliff and Kings Cross with the city. Despite the dearth of stops and the high frequency there are times at Kings Cross when waiting for the next train is a better option than forcing your way into an already crowded train. In fact out of Bondi Junction in the morning peak it is not unusual to have trains at frequent intervals virtually full from the start, with any remaining space taken up by the not insubstantial numbers of users from the other two stations. It is not all one way either – quite significant numbers of counter-flow travellers use the notionally empty trains in the opposite direction. The North Shore line south of Chatswood is probably the only other line in Sydney to compare in terms of full time high frequency services with high numbers of users.

The significance of the Eastern Suburbs line lies in its high on line population living within a reasonably compact area where most inhabitants are used to using public transport or walking. The area quite likely has the lowest car ownership per household in the country with quite a significant number of locals living without a car at all (it is no accident that nearly all the car rental companies have their home base in William St). Back in the days of Watson Bay trams the morning peak had something like two or three trams scheduled every minute inbound down William St (compare this with the Ministers rather lame 'one every three minutes at most' twaddle when dismissing light rail before the election). Trams had the great advantage that getting on and off was a very fast business so that even with this extraordinarily high frequency their transit time was significantly faster than today's buses or cars. The problem with the trains on the ESR run is that for very short journeys (we are talking an average of 2 - 3 stations) the trains are inappropriate - slow to load with limited standee space for journeys that hardly warrant the trek into the upper or lower deck to find a seat. In a nutshell while the double deck trains that run 100% of Sydney metropolitan services are suited to some services (longer haul, semi fast with infrequent stops and high peak loadings) they are quite inappropriate for others. It was something of a missed opportunity last year that the high performance single deck option was scrubbed from the agenda for new trains.

However a much better opportunity has been floated recently in a report that even rated a mention in the dailies – a Metro. Anyone who has been to London, Paris or New York (or a host of other world cities) will be impressed by the frequency and interconnectivity of metro trains in these places compared to our own rather lame near city services

Three years ago we arrived at Gare de Lyon in Paris (after a 900 km non stop TGV run from west of Nice) and while navigating our way down the pedestrian burrow that would take us to the RATP Line 1 were dismayed to see a train departing as we approached the platform. "Oh, golly" (or something along those lines) says I, thinking that we had some minutes to wait for the next. Not so – we arrived on the platform a minute later just as the next train did. At Bastille (our destination) we were not even off the platform when the following train arrived. Small five or six car trains, four doors per car, and free flow standing room with seats strategically spaced to not intrude on fast passenger flow. The revolutionary guillotine mechanism has apparently been adapted to shut the train doors with some zing after a few seconds warning hum, and the whole shebang is run with one person (or none in the case of line 14). Stations are probably average less than a kilometre apart and every second station has a direct interchange with another line or two. In fact the claim is made that no part of old Paris is more than 500 metres from a Metro (RATP) station.

But wait, this is not all – there is more. The main line railway (SNCF) have a five line underground system as well that has both double deck trains, very like Tangaras in ambience but with a French accent, and single deck trains depending on the line (the latter run to Charles de Gaulle airport

among other places) but which have a common fare system with their smaller brethren as well as sharing a considerable number of interchanges. I have no idea if there is a timetable as we know it for this network of services, apart from a prominent 'first and last train' time, but with such high frequency there is little point. Even on weekends and public holidays the trains run on a five minute headway.

Perpetual grumbling about the affordability of housing in Sydney reflects the inability of land, services and transport planning up until now to really come to grips with what is going on – the alienation of large parts of the city from itself while adding astronomical present and future costs to the community as a whole. The inner area loosely bounded by the coast, Maroubra, Canterbury, Ashfield , Haberfield and the Harbour, with a strip on the north side bulging out to Chatswood are well on the way to becoming a relatively high density living region within the much larger (geographical) city, yet transport services are relatively poor. Most trains give this inner area short change (apart from the aforementioned Eastern Suburbs and North shore lines) while the high density bus services are defeated by their own congestion. Suburbs along the Harbour (Glebe, Balmain etc) are particularly hard hit since the proverbial crow in these places is at a huge advantage compared to the citizen who has to wend their way via tortuous land routes. Fertile ground indeed for a Metro.

What should a Metro actually look like for a place like Sydney? For a start it must be able to contend with steep grades (Sydney is hilly) and sharp curves (the cheapest alignments are beneath existing roads). It should be designed for high frequency from day 1, with fast entry / exit arrangements, high acceleration but moderate top speed and have high standing room and rather less emphasis on seating. Trains do not need to be long – in fact relatively short saves huge costs for station construction, and their end profile should be designed to make the most efficient use of a circular bored tunnel outline even if much of the system might be done as cut and cover. Interchanges between lines need to be frequent, and include those with heavy rail and bus systems. No need for Clearways either – the very nature of a Metro avoids the complications that have been institutionalised in the existing heavy rail system. All metro trains serve all stations (on their line) – which is why high frequency can be achieved consistently all day long. Where the system rises to or above the surface the relatively light and compact nature of the trains allows for quite simple structures compared to those for heavy rail.

You will notice I make no comment about routing, even though in my mind there are a number of obvious choices here. The key issue with Metros is interchangeability between routes, so they do not have to be centrically focused nor even run in straight lines between termini. What they must do is serve population and activity nodes and they need to cater for a wide range of origin - destination choices within their service area.

All this is just wishful thinking at the present time. There is little likelihood that anyone in the halls of power would have sufficient vision to even grasp the concept let alone sponsor a latter day Whitton or Bradfield. There is just no visionary drive in government these days, with the dead hand of economic rationalists and adversarial politics keeping anything seriously forward looking well off the agenda. Until we have a truly powerful and visionary leader in this state I fear the concept of a compact efficient and cost effective inner core to this city is but a dream.
Now back to reality, and land auctions way out past Campbelltown where 'no planning' is described as cheap land.

THIS NEWSLETTER

Since the normal (?) editor is a swanning around a loooong way away this Newsletter has been compiled by Malcolm Cluett in order that members can be kept up to date with coming events.
That of course should not stop anyone, suitably inspired, from sending in a contribution to help maintain the standard of the next few Newsletters (surely we have some inspired or inspirational people among our flock?).

SYDNEY NEWSLETTER

ENGINEERS AUSTRALIA
RTSA

Railway Technical Society of Australasia
Sydney Chapter
Mail: PO Box 6238, Kingston, ACT, 2604

MAY 2007

NOTICEBOARD

KEY RTSA SYDNEY CHAPTER COMMITTEE CONTACTS

Bill Laidlaw	Chairman	0409 602 833	billlaid@bigpond.net.au
Malcolm Cluett	Secretary	9589 0226 (H)	malcolm.cluett@bigpond.com
Max Michell	Newsletter Editor	02 9331 5662	samrom@bigpond.com
Basil Hancock	Committee	Bob McCotter	Committee
Arnold Aranjo	Committee	Trevor Moore	Committee
Andrew McKay	Committee	Chris Venn-Brown	Committee
Andrew Honan	Committee	John Watsford	Committee

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 have stories, events or developments of interest that could make an interesting item for Sydney Newsletter.

Contact details are –
The Editor, Max Michell, e-mail to samrom@bigpond.com, phone 02 9331 5662 or post to P.O.Box 279, Potts Point, NSW, 1335. (but just hold back between early May and mid June while I absent myself from my appointed place of duty)

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

CPD CREDITS

Engineers Aust 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.

NOTICE TO MEMBERS RECEIVING RTSA NEWSLETTER BY EMAIL

If you should receive this Newsletter by post but would prefer to get it by e-mail (quicker and more reliable) then please let the Canberra know (address in the page header). E-mail saves time for you and costs for RTSA, which in the end can only mean better service to our members

DISCLAIMER

This Newsletter is published by the NSW Chapter of RTSA. Opinions do not necessarily reflect those of the Institution, Society, Chapter or Editor.