SYDNEY NEWSLETTER

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

MARCH 2007

NEXT RTSA SYDNEY CHAPTER MEETING

Thursday 12th APRIL

A JOINT IRSE AND RTSA MEETING

THIS MEETING WILL BE AT A NEW CITY LOCATION -

THE CITY CIRCLE ROOM – LEVEL 1
MERCURE HOTEL
LOCATED BETWEEN LEE AND GEORGE ST, OFF THE CENTRAL BUS PLATFORM IN RAILWAY SQUARE – RAIL ACCESS VIA THE DEVONSHIRE ST SUBWAY.

Starting at 15.30 (Networking and Nibbles) for a 16.00 Presentation
(NOTE EARLY START TIME)

Chris Lees from the RAILCORP Level Crossing Unit will present-

ALCAM – Australian Level Crossing Assessment Model

There have been a number of high profile and quite destructive level crossing crashes in recent times which have claimed lives and resulted in many millions of dollars worth of damage – Benalla, Trawalla, The Ghan, Lismore (Vic) and Garema to name a few. Heavy trucks are become far more prominent in level crossing collision statistics than they used to, causing an exponential increase in mayhem and destruction arising from these events There are many other less remarked crashes.

Chris will give an introduction to ALCAM – an objective modelling of risks associated with level crossings and designing to mitigate risks, an Australia wide tool that is able to be used to 'design' level crossings to suit circumstances. By using such measures we can plan to limit the incidence if crashes and their destructiveness.

Complimentary nibbles and networking from 15.30 prior to the presentation starting at 16.00.

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

ENGINEERS AUSTRALIA
RTSA

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

MARCH 2007

LEVEL CROSSINGS:

Following yet another catastrophic level crossing crash between a train and an errant heavy truck at Garema (south of Parkes NSW) earlier this month, ARA issued a strongly worded media release that reflected a growing sense of frustration with the lack of action and serous intent in regard to level crossings by road users and authorities (it should be observed that the same lack of action applies to a significant part of the heavy vehicle sector which consistently ignores rules (and laws) and intimidates car drivers and other road users on highways and regional roads).

The ARA release below is commended to readers, particularly those who will be at the next meeting.

ENOUGH IS ENOUGH: LEVEL CROSSING FATALITIES MUST STOP

The level crossing accident on Saturday 10 March is the fourth major accident in the last twelve months involving heavy vehicles.

The unnecessary tragic loss of lives would be preventable if road users obeyed the road rules while using the crossings. Furthermore, the derailment of locomotives and train carriages causes significant network delays and damages in excess of tens of millions of dollars every time.

Even though railway level crossing accidents are of low frequency when compared to road accidents, they have the potential to cause catastrophic damage.

“Do we have to wait until there is a collision between a heavy vehicle and a passenger train causing multiple fatalities before we get road authorities to take the matter seriously?” asked Mr Bryan Nye, Chief Executive Officer of the Australasian Railway Association (ARA).

“It is now time for Governments and those responsible for level crossing safety, such as enforcement agencies and road safety authorities to consider this problem as one of their priorities and take positive steps to solve it.” continued Mr Nye.

“Police and road traffic authorities around the country need to stop showing a blatant disregard for the issue of railway level crossing safety. These people need to step up and show they care by taking action.” Mr Nye said. It is also time for the trucking industry to start educating their drivers of the danger of illegal driving behaviour at level crossings.

“The rail industry is taking active steps in reducing the risk, decreasing the number of accidents and promoting safety at railway level crossings,” said Mr Nye. “Our goal is to have zero accidents at crossings, and we are working diligently to achieve this goal.”

Trains cannot stop quickly and cannot get out of the way to avoid vehicles. It is the time this message is made perfectly clear by the Road Safety Authorities to all drivers before we face a calamity.

LAST MEETING

At the March meeting Malcolm Cluett gave a very interesting presentation on Recent Developments in Steam Technology. The following is a report on his presentation:

Development of steam locomotives worldwide virtually ceased in the 1920s, even though steam locomotive manufacture continued until surprisingly recent times. (e.g. 1960 for British Rail and 1988 for China Rail).

A lot of the development work that was undertaken (particularly in France and Argentina) resulted in steam locomotives that were much more efficient, needing less maintenance, than elsewhere. This was not enough to withstand the tide of dieselisation and electrification of most of the world's railways, and promising avenues of steam traction research became dead-ends.

It must be admitted that the steam locomotive has an image problem, and is synonymous with

backwardness, smoke, dirt and hard physical labour for both the crew and the maintenance staff. However advances in many fields of technology, such as combustion, tribology, water treatment, welding, stress analysis, computational fluid dynamics, etc, may result in much-improved steam locomotives making a come-back. Advances in automation, and control of stationary boilers, has made the prospect of multiple-unit operation or even unmanned operation technically feasible (with oil or micronised coal dust firing). Automated control while burning lump coal is a more difficult proposition requiring considerable research.

Steam locomotives have one big advantage over other forms of rail traction; their ability to consume low-value solid fuels. Internal combustion locomotives need high-value petroleum-based fuels, which are increasing being sourced from unstable parts of the globe. Conversion of solid bio-fuels to liquid products such as ethanol is itself wasteful of energy and required considerable transport of feedstock materials to the plants.

In particular, steam locomotives can easily consume renewable fuels, such as agricultural wastes and wood. This was common practice in many countries, in such disparate places as Finland, Thailand, Angola, Indonesia, Brazil and even the USA on a common carrier railroad that lasted until 1950.

One of the avenues for improvement of steam locomotives is the gas producer firebox, in which the fuel is 'roasted' rather then being burned on the grate in a fierce upwards draught. Most of the heat is produced by combustible gases liberated from the firebed, which are then burned by means of secondary air admitted above the firebed. It can greatly improve the combustion efficiency, and is especially amenable to renewable fuels which are easily carried away by the upward draught through the firebed on a conventional grate.

Malcolm explained the thermodynamic reason for the typically low thermal efficiency, which is related to the difference between the steam temperature at the inlet and exhaust of the cylinders. Since the exhaust temperature is fixed, most of the benefits of higher thermal efficiency are obtained from the use of hotter steam, which in the past had caused lubrication difficulties.

At the dawn of Internal Combustion technology, it was realised that external cooling of the cylinder block was necessary. However it wasn't until the 1980s that cooling of the inlet valves, in association with the use of very hot steam, was used in a steam locomotive. This was when engineers Porta and Wardale collaborated to rebuild a South African steam locomotive. The results of this work was startling, particularly with the constraints associated with a rebuild of a 30-year-old loco rather than a completely new design. Under dynamometer car tests, the modified locomotive demonstrated 37% greater drawbar power, 65% coal savings and 45% water saving compared with the unrebuilt locomotives.

Water treatment was often neglected by steam locomotive operators, leading to build-up of scale on the heat-transfer surfaces of the boiler. Research in France, then Argentina, has shown that allowing the boiler water to become alkaline, with high solids content, eliminates scale formation in the boiler. Carry-over of solids with the steam ('priming') is prevented by anti-foam chemicals. This allows the use of much higher boiler temperatures and pressures, as well as improved technology such as water-tube boilers, with safety. blowdowns and regular washouts are virtually eliminated. As stated earlier, the use of hotter steam is the key to obtaining better thermal efficiency from the machine as a whole. The cost of the water treatment chemicals is far outweighed by the reduction in boiler repairs and reduced energy costs.

The exhaust arrangement of the steam locomotive, in which the spent steam is propelled through a nozzle and diffusers to entrain the hot gases from the fire, is also critical in the performance of a locomotive. The amount of back-pressure in the cylinders should be minimised, and the amount of gases from the fire should be maximised. This technology has greatly advanced since the days of steam, and will result in locomotives with much

improved efficiency. The loud puffing sound characteristic of steam locomotives at high power outputs, which can delight the steam enthusiasts, is a symptom of poor design and a demonstration of wasted energy.

The use of plain bearings is almost unknown in related machines, but most steam locomotives lacked the obvious benefits that roller bearings can offer. Whether oil or grease lubricated, and whether axlebox or motion bearings, the use of plain bearings wasted countless hours of preparation time on the part of the crews, and were prone to failure. Plain bearings imposed an un-necessary ceiling on the speed and power output of most steam locomotives, and dictated frequent workshop attention. Only one type of steam locomotive in mainland Australia had roller bearings on the motion parts, and then on the big-ends only. The last-built steam locomotives for British Rail and China Rail, mentioned above, also lacked roller bearings on the driving axleboxes and motion !

By comparison, plain axle-box bearings are almost unknown on diesel locomotives. (The writer can only think of three types of diesel locos so-fitted in Australia.)

Steam locomotives tended to be serviced and repaired in rather crude workshops, which would be unsuitable for diesel traction. Steam locomotives were occasionally operated with one cylinder out of action ! For three cylinder locomotives the load was reduced by a third, while for 2-cyl locomotives the load was reduced by half ! (In the latter case the locos were only used as assistant engines, because if they stopped with the crankpin in the dead-centre position they would be unable to get moving again!) The reason to resort to these desperate measures was the constant problem of keeping plain bearings operational. The inevitable wear which accompanies plain bearings imposes shock loads on the whole structure of the steam locomotives, clearly audible as clanking and knocking sounds. Diesel locomotives could never cope with such rough treatment.

During the steam era, not much attention was paid to making the motion parts as light-weight as possible. This has resulted in balancing problems at high speed, and otherwise un-necessary speed limits. In other countries, designers resorted to complex multi-cylinder steam locomotives for higher speeds, which solved the balancing problem but at the cost of additional maintenance. Modern technology in the form of high-strength alloys, finite element analysis and complete use of roller bearings, will allow the motion parts to be lighter, in turn permitting higher speeds and/or the use of smaller sized driving wheels.

Even in the 1940s, the old adage of " the fastest safe speed is the diameter of the driving wheels in inches " could be increased by at least 50%. Unfortunately the design of steam traction in the past depended on hundreds of such empirical rules, rather than proper engineering design on scientific principles.

One basic problem of steam locomotives is that while they can generate high drawbar powers, the tractive effort is limited by the adhesive weight, which is typically only a third of their total mass (engine & tender). As mentioned above, smaller driving wheels allow more driving wheels to be fitted within the same design envelope, increasing the tractive effort and freight-hauling productivity.

The French designer Chapelon explored the limits of this with an experimental 2-12-0 locomotive, but the results were hampered by WW2 and the limited drawbar capacity then in general use for freight trains in France.

Mauritius's tiny standard-gauge railway system, which primarily hauled sugar cane, had garratt locomotives with more tractive effort than the NSW garratts, primarily because they were designed with most of their mass on the driving wheels. The NSW garratts, the most powerful steam locomotive in Australia, was designed with a 16-tonne axle load, and had a modest tractive effort despite their 260 tonne overall mass.

Again, modern technology, in the form of hydrostatic power transmission products and

commercial steam turbine units, may allow tractive effort to be boosted at slow speeds with (say) every axle of the tender powered.

Malcolm showed some amusing slides demonstrating that a 3-axle semi trailer had a higher axle load than the most powerful steam locomotive in Queensland (the QR garratts). Road-going buses and cranes are allowed even higher axle loads. It is hardly surprising that steam locomotives are lacking in tractive effort compared with current diesel locomotives.

Wardale did an assessment of the South African garratt locomotive, which was very similar to the contemporary garratt locomotives in NSW. He points out that the badly designed steam circuit, with undersized pipes, was a major factor which prevented the locos being used at high power outputs, and resulted in extravagant coal and water consumption. Had the boiler been somewhat smaller, there would have been more room for larger diameter steam pipes, and in all probability a higher power rating despite the smaller boiler.

Condensing steam locomotives were a rarity but were used in Zimbabwe, Germany, Argentina and especially South Africa where the '25 class' lasted in regular service from around 1951 to around 1981. Since much of Australia is dry, and facing water restrictions, condensing locomotives might be appropriate here too. All of the related technologies would have greatly improved in the past fifty years since these locomotives were designed. Condensing allows the possibility of reducing the cylinder exhaust pressure below atmospheric pressure, with resultant gains in thermal efficiency. There are difficulties in achieving a suitable air-cooled condenser within the space and mass limits in the railway environment, however. (Steam ships and thermal power stations use water-cooled condensers.)

Steam locomotive with turbine propulsion, instead of reciprocating cylinders, were built in small numbers. Some were built with electric transmission, and others with direct drive. Both types had some successful examples and this is another area where some research could be applied.

The remote coal-hauling Rio Turbio railway in the far south of Argentina deserved special mention. Despite the 750mm track gauge (less than the Puffing Billy railway near Melbourne) and the severe climate, a fleet of small Japanese-built steam locos performed prodigious haulage feats, with minimal maintenance, until the line went over to diesel traction in 1997. The indefatigable L D Porta had a say in the design of these locomotives. Every train on this line was heavier than any steam-hauled train on the NSW rail system. With rationing of petroleum fuels now a reality in Argentina, plans are afoot to revert to steam haulage, and to further develop steam traction (as Porta sought to do until his death in 2003). The railway will be upgraded and extended down to the Pacific Ocean coast in Chile.

In Switzerland, a specialist company has built batches of new Rack Tank locomotives in the 1990s for mountain railways in Switzerland and Austria. Their performance and productivity compares favourably with diesel locomotives and diesel railcars.

Most steam locomotives had rudimentary insulation of the heated parts. For a medium-sized locomotive, radiation losses are estimated at a continuous 100 KW. This wasted energy should be converted to useful work, and insulation technology has greatly improved in recent years.

Problems with conventional steam traction as outlined above, combined with the public's willingness to continue patronising steam-hauled trains on mainline railways, have led some to suggest that the time is right for new-build locomotives to replace the old-timers. The new locomotives would incorporate all of the advances in technology, and be suited to high speeds, but would retain the visual appeal of the Stephensonian steam locomotive (though without the black smoke). It is interesting to reflect that loco 3801 in NSW is now over 60 years old.

The writer sees the biggest opportunity for steam traction, however, is to allow the railway industry to quickly become greenhouse-neutral by means of bio-fuels. It is easier to do this in the constraints of a railway environment, than in the constraints of a road-going vehicle. A new-generation of steam locomotives may therefore increase the competitive advantage of rail transportation compared with road haulage, in a future dominated by carbon taxes. Now might be an appropriate time to continue Porta's research into the effective use of bio-fuels within steam locomotives.

It is true that an electrified railway may also exploit renewable fuels, but at high capital cost. It will never be economic to electrify every railway in Australia.

It is interesting to compare thermal efficiencies of the various forms of railway traction (in round figures):
Conventional steam ~6%
New-build steam ~15%
Diesel ~30%
Now the fuel cost, in terms of heat energy per kilogram, is a lot less than half in the case of coal versus oil. On this basis, new-build steam traction could be justified on economic grounds. However fuel costs are not the only costs involved in locomotive operation.

Despite all of the design deficiencies outlined above, Malcolm showed images of steam locomotives in North America, with axleloads no heavier than contemporary diesel locomotives operating in NSW, handling trains of 15,000 metric tons unaided, and other locos which regularly ran 45,000 km per month. Steam locomotives can easily run at speeds higher than the current limits prevailing in Australia. Yes, there is potential to improve the design of the steam locomotives. The problem is that everyone's expectation of steam traction is too low, and (apart from a handful of experimental locomotives in Argentina and France) steam traction has never operated at its full potential.

As engineers, the task of undertaking the design, manufacture and test work on a new generation of locomotives will be coming our way. Maybe we should be getting ready.

THE OBSERVATION POST

There are long term proposals in Victoria to create a new port at Westernport (the bay in which Philip Island dwells for you bikers out there) near Hastings. This place already has a dedicated port associated with the steel coil plant once owned by BHP and now part of the Bluescope empire. Freight trains to the steel plant run via the suburban electrified Frankston line and over the steeply graded non electrified line beyond there. There are usually no more than two freight trains each way per day.

Part of the conceptual port development could involve container facilities Rail access to the port is a prime issue. There is a proposal to build a new line from near Dandenong (30 km east of Melbourne on the main Eastern line) through a sandy hobby farm and market garden area to the port, which might include standard gauge. Although such a link is a long way off, the inevitable 'nimby' stuff has surfaced with some fairly strong words – such as in the following item from the suburban 'Oakleigh Monash/Springvale Dandenong Leader' newspapers -

Fear over freight trains
Melinda Marshall
7 March 2007

*A lobby group fears **scores** of extra freight trains could **hurtle** through Greater Dandenong each day under port development plans.*

*The group also says the **trains could carry nuclear material** under speculation Western Port could be the future site of a nuclear power plant.*

Western Port Action Group opposes development of the Port of Hastings, which will increase freight traffic on south east roads and rail lines.

*"We're talking **40 freight trains every day,** possibly **double stacked and 1.2km long,**" said*

spokeswoman and Hampton Park resident Lynette Keleher.

*"Just imagine the **air pollution, noise pollution houses near the tracks might crack. Traffic would be held up.**"*

"Do you know how long it can take for a freight train to pass?"

*The group also believes a proposed inland port at Lyndhurst station could bring **a further 80 freight trains a day** through Dandenong from the Port of Melbourne.*

Port of Hastings Corporation chief executive Ralph Kenyon said the developed port was expected to generate a maximum of 16 extra freight train movements a day.

The Dandenong line takes 11 freight trains each week day.

Mr Kenyon said the extra trains were likely to be split between the Dandenong line and the Frankston line. Many of the trains may terminate at the Lyndhurst inland port rather than continuing through Dandenong.

He said the trains could be between 600m and 1.2km long, but double-decker trains were unlikely because the metropolitan network could not support them. The developers of the proposed Lyndhurst inland port, Salta Westgate Group, could not be reached for comment.

Speculation over Western Port's nuclear future began with a January report by research centre, the Australia Institute that named the region as potentially ideal for a nuclear power plant.

Mr Kenyon said the corporation opposed the siting of a nuclear plant there. "It's a no to a nuclear power plant as part of our port development and it's a no to the port handling nuclear products."

I have highlighted some of the more dramatic claims attributed to Western Port Action Group (WPAG) in regard to the possible new rail line. Just look at the language – scores / hurtle / nuclear / 40..every day / double stack / 1.2 km long / air pollution / noise pollution / houses ..crack / (road) traffic held up. This is all very inflammatory language, but how much substance is there in reality.

The Port of Hastings CEO, Ralph Kenyon, is reported with facts that partly rebut the worse excesses of the 'nimby' claims with some reasoned comments – a maximum of 16 trains per day between 600 and 1200 metres long split between the Frankston and Dandenong line, no double stack, no nuclear – and so on. Despite this the whole import of the news item is one of fear and loathing, and it is this impression which will carry into the readership of the item. Repeat the claims often enough and it will become 'common knowledge' in Melbourne's eastern suburbs that rape and pillage is about to descend upon them.

Not all that long ago there would have been a scramble to have a railway line built to any and every town and settlement. The railway meant efficient and fast transport and was seen to be an economic lifeline for most. There were even places where railways were authorised to enable the land to be opened up for the first time – the egg and chicken at work. Have a look at the 1880's Victorian 'Octopus Act' for a classic example.

There was nary a squeak around 40 years ago when the spur line to the cold rolling plant was built and in fact the development (in total) was seen to be a major employment generator and insurance for the survival of the Stony Point rail line. More recently when the near moribund line from Dandenong to Korumburra and beyond was electrified to Cranbourne and given a full time passenger service the only complaints were to do with competing claims for an intermediate station. Why then should there be such negative reaction in relation to a new rail line now?

For a start it is a freight proposal and as far as most people are concerned they have no idea what that means. The rail industry has so successfully removed itself from public

consciousness that most have no concept of what is involved in a freight railway. When you look at the possible situation of 16 trains a day at an average 900 metres long, the alternative would be more than 1000 semi trailer movements per day. Is the lobby group seriously arguing for 1000 articulated truck movements a day more than now? I doubt it. What they are arguing for is in reality the simple 'not in my back yard' – we don't care what or where you put it, we don't want it here. An argument that is remarkably similar to the North Coast (NSW) dwellers who are sick of B-doubles and semis clagging up their highway and want them redirected to the New England Highway – nimby!

The nuclear comment by WPAG is symptomatic of a second problem – extension of the basic 'port' argument into an emotive and quite dishonest issue to do with nuclear on rail in the region. The absurdity of this argument is obvious – unless a nuclear facility, which has nothing to do with the new port or new rail line, is built in the area there will be no need for any nuclear transport of any sort. If however a facility is built then nuclear fuel will have to be brought to the area if not by rail then by road. How would you prefer your nuclear fuel to be moved, based on the statistical risk of these two modes? I thought so – a hurtling road train overturned and leaking nuclear in the middle of a Westfield shopping centre would be most undesirable (I am adopting the 'new' approach to lobbying here). The issue in the nuclear case of course has nothing to do with transport and everything to do with energy and research, so why not attack the problem, if there is a problem, at that level? By attacking the potential railway on the grounds of 'nuclear', double stacking (un-achievable, but wouldn't that reduce the number of trains?), and traffic hold ups (but wouldn't there be 1000 less trucks than otherwise?) the WPAG is reducing the debate to low level primary school standard – an emotional level at which we should not be contemplating planning our futures.

Irrational posturing by any number of self interest groups, ranging from the NTC and its acolytes to small scale local groups often led by one or two manipulative individuals, is becoming endemic. The concept of 'no' is becoming the new norm and replaces the concepts of yes, vision, progress, win-win and the like. With the acceptance of the 10 second media grab has come the first grab (however rational or honest) is the best grab – make the news with the most outrageous claim and let good logic and commonsense try to overturn the initial impression. The depressing part of all this is that the media takes no interest in the value of these outbursts as long as they give good pictures or provide headlines for the next news. Where has good reporting and journalism gone you might well ask - and to which you will get almost total silence.

The rail industry, in progressively separating itself from government and Ministerial interference (apart from one premier state), has also departed from the minds and awareness of the public at large. Somehow we need to get the concept of 'rail good' back into the collective thinking of the public, such that it informs their views when things get difficult. The good denizens of the North Coast might then argue that excessive numbers of B—doubles and semis should be reduced by aggressive investment in rail, rather than playing 'pass the parcel' between highways. Then and only then might we get to a point where land transport investment, pricing and planning in this country starts to become the 'best for the nation' program that AusLink in its current guise pretends to be.

TRANSFORMING CANADA'S RURAL RAILWAYS

Ed Zsombor, Director Rail Services Unit and Provincial Railway Inspector, Saskatchewan, Canada gave the keynote presentation at the recent Wagga Regional Rail Symposium as well as a series of 'eminent speaker' presentations to various RTSA Chapters. The conference was a great success, in no small measure due to Ed's presence. It is quite obvious that rail regulation in Saskatchewan is as laid back (although apparently is quite effective) as ours is onerous. If for no other reason readers should have a read of this summary of Ed's presentation written by Stephen

Townsend, Editor of the RTSA South Australian Newsletter following Ed's 'eminent speaker' evening there.

Introduction

Rural Canada and Australia produce mainly rural based product such as grain. A comparison of grain production is made in the following table:

Comparison Grain Production in Canada and Australia

	Canada	Australia
Grain Production (Million Tonnes)	64.7	37.1
Grain Exports (Million Tonnes)	27.4	22.2
Average Rail Haul (Miles)	904	250

Some of the major differences include:

i) Climate
ii) Growing season – Canada's is relatively short
iii) Length of average haul
iv) Railway infrastructure – Canada has a uniform track gauge
v) Canada formers have extensive on-farm storage facilities.

An overview of Canada's railways is as follows:

i) There are approximately 40,000 miles of railways in Canada.
ii) Shortlines account for approximately 6586 miles.
iii) There are over 40 shortline and regional railways.
iv) Shortlines originate 25% of all rail traffic.
v) There are two Class 1 carriers being Canadian Pacific (CP) and Canadian National (CN).

Abandonment Process for Railways

The 1996 Canada Transportation Act made a major difference to how unwanted railways were handled. Prior to 1996, most railways were owned by either of the two Class 1 railways. If a railway line was deemed non-viable the process for the abandonment of the railway was cumbersome and difficult and required public hearings. If abandonment was approved, the line was inevitably dismantled by the owning railway without any opportunity for others to gain ownership.

The 1996 Canada Transportation Act simplified the abandonment procedure but made it possible for the railway to be purchased by others. Before a line could be abandoned, the Act required the owner to prepare a three year abandonment plan that included:

i) Advertisement of the railway for commercial sale.
ii) If no commercial buyers appeared, the railway is offered to Local and or Provincial Governments for net salvage value.
iii) If Local or Provincial Governments did not take the line, the line can then be abandoned with the requirement that the railway owner pays compensation at a rate of $30,000 per mile.

The main result of the Act was that most railways marked for abandonment were taken up by commercial or government bodies with a large increase of shortline railway track length. In Saskatchewan, shortline railway track lengths grew from less than 50 miles in 1996 to 885 miles in 2006. As of 2006 the Saskatchewan rail network of 6068 miles was composed of:

i) CP/CN Mainline – 2195 miles
ii) CP/CN Branchlines – 1210 miles
iii) CP/CN Branchlines on 3 Year Plan – 781 miles
iv) CP/CN ar risk Branchlines – 998 miles
v) Provincial Shortlines – 885 miles

The ownership structure for shortlines in Saskatchewan includes:

i) Local co-operatives
ii) Private companies and consortiums

iii) Local and provincial government
iv) Private public partnerships

Saskatchewan Shortline Details

Some of the traffic details of the Saskatchewan shortline railways are:

i) 21,273 cars moved in the 2005/06 crop year
ii) 17% were producer cars, i.e. grain cars loaded by the producer
iii) 22% grain cars, i.e. grain cars loaded by grain companies
iv) 61% non-grain cars – mostly forestry
v) Line traffic densities range from 4 to 49 cars per mile of track.

Provincial lines are assessed for viability on the basis of cars per mile of track. The assessment criteria used is:

i) 0 to 10 cars per mile – May not be able to cover operating expenses.
ii) 10 to 20 cars per mile – Marginally profitable.
iii) 20 to 40 cars per mile – Profitable but unable to re-capitalise.
iv) 40 + cars per mile – Revenue adequate.

The average Canadian shortline operating ratio, i.e. operating cost per revenue, is 95%. The Provincial governments accept that capital grants are required for capital renewal of the railway infrastructure and moneys are made available for this on a justification basis.

The shortlines have a number of grain collection systems including:

i) Producer car loading.
ii) Producer car loading facilities
iii) Country elevators
iv) Inland grain terminals
v) Port terminals.

Canadian farmers are able to load their own cars and bypass grain companies thus allowing them to increase the return on the grain they sell. The cars are ordered through the Canadian Grain Commission (CGC). The CGC handles all grain grading and the cars are delivered to Port Terminals.

The Canadian Wheat Board is the buyer of all producer cars carrying Board Grains, i.e. wheat, barley and durum. All non-board grains are sold through grain companies and use the country elevator/terminal system.

Grain freight rates are determined by The Revenue Cap which is a special formula that limits the maximum revenue entitlement a railway can charge. Non-grain freight rates are unregulated and are set by the Class 1 Railways (CN & CP) and are based on what the market will bear. Shortline revenues are generated through revenue sharing agreements with the Class 1 Railways.

Railway Jurisdiction

Shortline railways have a different jurisdiction than that of the Class 1 Railways. The differences are shown in the following table.

Comparison of Railway Jurisdiction

Canada	Saskatchewan
Transport Canada	Saskatchewan Highways and Transportation
Canadian Transportation Agency	Highway Traffic Board
Transportation Safety Board	Rail Services Unit
Regulations	Guidelines
Safety Management Systems	Safety Management Plans
No distinction between railway operator and owner	Railway operators and owners are considered as different entities
Class 1 Railways (CP/CN)	Any Railway Owner/Operator Not Federally Regulated
Shortlines that cross provincial borders	Regional Shortline Railways
Railways that enter the USA	Industrial Operators

SYDNEY NEWSLETTER

ENGINEERS AUSTRALIA
RTSA

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

MARCH 2007

Rail Services Unit

In Saskatchewan, the responsibility for railways is with the Rail Services Unit. The Rail Services Unit has a mandate for the:

i) Development of shortline railways
ii) Provision of financial support
iii) Safety

The development of shortline railways is achieved by:

i) Providing general advisory services on the abandonment/transfer process.
ii) Providing track inspection/assessment services.
iii) Assisting with the negotiation of Agreements.
iv) Providing necessary authorizations to purchase and operate a shortline railway.

Financial support is provided by:

i) Providing grants for feasibility studies and business plan development.
ii) Providing a Provincial Loan that can be an interest free loan of up to 32% of net scrap value or purchase price. The loan is dependent on a number of criteria including a viable business plan, a minimum 8% local investment and strong local support.

The Rail Services Unit provides advisory services to:

i) Local producers group
ii) Local Governments including rural municipalities, towns and villages.
iii) Area Transportation Planning Committees, which has a mandate to look strategically at transportation and make recommendations to the provincial or municipal governments based on social and economic goals of the area and the province.
iv) Regional Economic Development Authorites (REDA) that have a mandate to bring people and communities together to collaborate and co-operate on plans for economic development based on natural trading areas and to link the resources, talents and strengths of their regions to support the creation of wealth and jobs, and to attract new investment. REDAs are voluntary, non-government, legal entities comprised of local governments, aboriginal groups and businesses.

The safety role provided by the Rail Services Units includes:

i) Crossing and Track Inspection Program
ii) Safety and Operational Innovation
iii) Review and Authorize Safety Management Plans
iv) Railway Safety Education
v) Accident Investigation

Relationships between Shortlines and Class 1 Railways

In the past, CN and CP viewed shortlines as an annoyance. They now treat shortline railways as partners.

CN and CP realize shortlines are better at generating local traffic.

Shippers receive improved service and flexibility.

Class 1 railways can focus on mainline operations with the shortline railways taking care of the low density Branchlines and the collection and distribution of branchline traffic.

The partnership between the Class 1 and shortline railways is mutually beneficial due to:

i) Fair revenue sharing agreements.
ii) Running rights and interchange agreements.
iii) Fair purchase or lease agreements.

Issues that require further development include:

i) Insurance Requirements
ii) Car Supply
iii) Sharing of Fuel Surcharges.

Challenges and Opportunities for Shortline Railways

The challenges facing shortline railways include:

i) Obtaining capital to rebuild old infrastructure
ii) High fixed costs such as for insurance and property taxes.
iii) Ability to carry increased car masses.
iv) Jurisdiction issues.
v) Legislative issues
vi) The future of the Canadian Wheat Board
vii) The Canadian Grain Commission.

The opportunities for shortline railways include:

i) Producer car savings of approximately $1000 per car.
ii) Stability for economic development. Approximately $300M in economic development is being spent on shortlines compared to virtually nil on the CP/CN branchlines.
iii) Public infrastructure savings with approximately 1.9m tonnes kept off roads in 1995.
iv) Direct shipper savings compared to trucking costs of approximately $10m per annum.
v) Environmental benefits including reduced greenhouse gas emissions.

The Province of Saskatchewan has developed a strategy for the development of shortline railways that has been integrated into the overall transport strategy. A part of this strategy is to identify the core railway network on the basis of Federal, Provincial and Local interest. The strategy also recognizes the importance for a role in the supply of capital monies to allow ongoing capital investment.

FUTURE MEETINGS

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

Thur 3rd MAY at Chatswood:
Mr. Stephen Walsh, Director of Operations for Hardface Technology will present on specialised rail repair and grinding techniques.

Thur 7th JUNE at Chatswood: tba

Thur 5th JULY at Chatswood: AGM and tba

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

Thur 6th SEPTEMBER at Chatswood: tba

Thur 4th OCTOBER at Chatswood: tba

Thur 8th NOVEMBER (a week later than normal)
A change of topic – Downer EDI on the subject of 25kVA electrification as practiced in Queensland and Western Australia.

AusRAIL PLUS 2007 – CALL FOR PAPERS

The technical committee of AusRAIL PLUS 2007 invite submission of 400 – 600 word abstracts of proposed papers for presentation at the above conference. Papers need to relate to the rail sector and should be either in your area of expertise or an area of strong interest. Relevance, timeliness and quality are key factors in the assessment of proposed papers.

This is a good opportunity for rail professionals to place on the record something of the original, productive or interesting work that they have been involved with, while enjoying the opportunity to mix with a large number of like minded people from our industry. The closing date is April 13th (one day after the next meeting, and the Friday after Easter).

Abstracts should be sent to Loic Beuzit at ausrail@informa.com.au or faxed to 02 9290 2577. Loic can be contacted on 02 9080 4309. I am sure he will be delighted to hear from you.

COMING EVENTS

AusRAIL Plus 2007 will be back at the usual Darling Harbour location in Sydney from 4th to 6th December 2007. See separate item regarding a 'Call for Papers' for this conference.

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

MEMBERSHIP – JOIN UP A NEW MEMBER

While this newsletter is primarily intended for members it is distributed more widely than that. Readers who are not members of RTSA should seriously consider joining the organisation. Details of membership and how to join will be found in the RTSA website at www.rtsa.com.au

Although RTSA is a technical group under the auspices of Engineers Australia it is open to everyone who has a real interest in railways. It is the only technical group which covers all disciplines (civil, mechanical, electrical, signalling, communications etc.) and as such is one of the most rewarding rail technical networking groups in the country. The annual cost is very reasonable, and the rewards are considerable.

RTSA offers a number of regular activities for its members, including meetings, visits and technical tours. The every other year Conference on Railway Engineering (CORE) is a highlight. A number of awards are made annually to encourage recognition of meritorious activity in support of the rail industry. A particular RTSA attribute is that it engages in considerable well reasoned and structured lobbying in support of the rail industry with regular submissions and presentations to policy study groups and enquiries. Membership, in support of this activity alone, is very worthwhile. Consider joining RTSA now if you are not yet a member. If you are a member see if you can introduce a friend as a new member.
Remember - www.rtsa.com.au

SYDNEY NEWSLETTER

ENGINEERS AUSTRALIA
RTSA

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

MARCH 2007

NOTICEBOARD

KEY RTSA SYDNEY CHAPTER COMMITTEE CONTACTS

Bill Laidlaw	Chairman	0409 602 833	blaidlaw@bigpond.com
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.
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