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Railway Technical Society of Australasia
SA Chapter
Engineering House, Bagot Street
NORTH ADELAIDE SA 5006

JUNE 2005

NEXT MEETING

The next meeting will be held on

THURSDAY 7th JULY AT BAGOT ST, NORTH ADELAIDE (Institution of Engineers) - at 17:30.

Topic:

RE-TENDERING OF TRANSADELAIDE'S RAILCAR MAINTENANCE CONTRACT

Dean Phillips

TransAdelaide recently re-tendered the maintenance contract for its diesel railcars.

A new contract has now been awarded with a new maintenance contractor taking over the maintenance of the railcars during the recent long weekend.

Dean will talk about the railcar maintenance contract, the issues faced by TransAdelaide in maintaining its railcars and the process used in selecting the successful maintenance contractor.

CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)

IEAust members are reminded that attendance at RTSA technical meetings contribute towards CPD requirements. Each RTSA technical meeting generally has a value of 1 CPD point.

LAST MEETING

At the last meeting, Robb Van Toledo, Manager, Specialised Rail Services – John Holland Pty Ltd, spoke about Rail Grinding, Improved Machine Use and Efficiency. While Robb described the grinding machines operated by John Holland, the main topic of his talk was the changes in approach to operation – One Pass Grinding - and pricing – Sliding Rate Pricing - of the grinding machines when in service. Robb advised that the adoption of these methods have significantly improved John Holland's grinding machine efficiency and allowed significant cost savings to clients.

A copy of Robb's paper follows:

Rail Grinding
Improved Machine Use and Efficiency

Robb van Toledo
John Holland Rail Division

Summary

This paper describes the application of improved management techniques to maximize the efficiency of high production machinery, and in particular, production rail grinding machines.

This paper also discusses the benefits that have been achieved and how they are shared between the asset owner and the machinery supplier.

John Holland Rail Division Experience

John Holland has been a track construction and maintenance contractor since 1991.

John Holland entered the rail grinding business when it purchased the Loram Australia business in May 2000. With the purchase included the following machines:
RG7, 32 stone rail grinder
Shoulder ballast cleaner

Since then, John Holland has also purchased:

i) RG8, 8 stone rail grinder, Commissioned, March 2001
ii) RG9, 48 stone rail grinder Commissioned, March 2004

For the future, John Holland are considering the purchase of a:

i) RG10
ii) Ditcher

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The Procurement of the RG9 Rail Grinder

The procurement of the RG9 rail grinder began by identify the most suitable machine in terms of capability and production. Machines from various suppliers were reviewed for performance and efficiency and compared with the varying experience and railway environments in Europe and North America.

The machine had to comply with Australian Standards including:

i) Electrical/ladders/railing/signage etc
ii) Axle load limitations
iii) Load gauge limitations

As the latter two requirements vary from state to state, the machine had to meet the minimum conditions for the tracks where it may be expected to work.

Accreditation and commissioning details had to be obtained to satisfy the various state regulatory bodies and in particular the DOI Victoria. Extensive risk assessments were carried out together with intensive verification of the machine performance and operation procedures.

Photo – RG9 Rail Grinder at Mile End

RG9 Rail Grinder Production Record

The RG9 rail grinder has performed well since it began contract rail grinding work. Some of its achievements include:

i) ARTC, 1034 finished km of which approximately 70% was one pass grinding.
ii) Flinders Power, 33 finished km using a mixture of maintenance and corrective rail grinding.
iii) WestNet, 884 finished km of which approximately 85% was one pass grinding.
iv) Freight Link, 1378 finished km of which 100% was one pass grinding on new track.

Note all completed track must still comply with the client's specification (ie +-0.2mm).

Background to Rail Grinding

Rail grinding is the correction of longitudinal and transverse rail profiles.

Why Grind? To reduce noise, improve ride comfort and reduced maintenance of both track and rolling stock. Research suggests that rail grinding provides a cost benefit of approximately 3:1.

Grinding machine capability is simply its efficiency at removing metal in a controlled manner, i.e. its metal removal rate.

Issues that affect the efficiency of a grinding machine include:

i) Pattern selection and crew ability
ii) Grind stone life and cutting ability
iii) Motor HP and independent motor movement
iv) Machine travel speed and stabling location
v) Track time and flexibility grind location
vi) Other issues such as fires, breakdowns, etc

There are two basic forms of rail grinding. These are:

i) Corrective grinding corrects the profile of badly worn rails. This requires a high metal removal rate and multiple passes of the machine.
ii) Maintenance grinding maintains the rail profile of slightly worn rails and extends rail life. This method requires a low metal removal and a low number of passes and ideally only a single pass.

Developments by John Holland

One Pass Grinding

The ability to correct the railhead profile in one pass is considered the ultimate aim. To achieve this there are two requirements. The grinding machine must have the grinding capability to remove the amount of metal required to achieve the desired rail profile and the actual grinding stones must be developed to provide the optimum balance of metal removal rate and life.

John Holland considers that the RG9 grinding machine and the grinding stones that they are currently using, comes close to achieving this aim.

Experience to date has shown that for Corrective Grinding, only minimal improvement in efficiency is achieved because of the large amount of material to be

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removed. The grinding is just completed quicker as a result of fewer passes being required.

Maintenance Grinding on the other hand has shown a huge efficiency improvement as a result of:

i) Continuously moving in one the direction
ii) Moving with the traffic at 10-14kph
iii) Being able to work as a "slow train"

Sectional Grinding

Sectional Grinding is a refinement on One Pass Grinding and achieves improved efficiency when applied to Corrective Grinding. An example shows how.

The section of track in the Adelaide hills between Goodwood and Belair has numerous tight curves, steep grades and times of very intense traffic.

Sectional grinding involves the rail grinder working from Goodwood to Belair, non-stop as a train between services, grinding each curve as required as it goes. Upon reaching Belair, it then returns to Goodwood as a train, between other train services, again targeting those curves that require another pass and so on until the section is complete. By this method, high efficiency is achieved without disruption to other rail traffic.

Sectional grinding also overcomes issues with level crossings as the speed of the grinder and single direction of work means that road traffic are not held up for extensive lengths of time and extra people to man level crossings are not necessary.

Sliding Rate Pricing

Traditionally, rail grinding is priced as either a lump sum or as a fixed rate per finished km. The disadvantages to these methods of pricing are:

i) For the Client, there is no incentive to improve track time
ii) For the Contractor; risk is covered by increasing the rates

On the other hand a sliding rate pricing approach provides:

i) A non-adversarial alliance style contracting where there are performance incentives and penalties to both sides
ii) Is entirely transparent and quantifiable
iii) Provides indicative values only

Combined Benefit

By combining a One Pass Grinding method with a fair Sliding Rate, the benefits to both the operator and asset owner may be compounded still further, i.e. the efficiency of one pass grinding is linked to performance incentives.

The asset owner can put a value on the cost of poor grinding time verses the cost of holding back a scheduled service and thus make a decision as to who gets track time based on the optimum cost saving.

The true cost of grinding of a particular corridor can be determined, i.e. the effects of curves/grades, poor track time, aggressive profiles etc. are not hidden in a generic lump sum.

The results of some examples of the use of one pass grinding combined with a sliding rate are:

i) ARTC – Already have a close working relationship with John Holland. One Pass Grinding has reduced the cost of finished km by 16%. Sectional grinding has been introduced.
ii) Westnet Rail - Has accepted both One Pass grinding and the Sliding Rate approach. A reduction of 28% in the cost per finished km has been achieved due to this alone. John Holland is able to provide a full grinding service utilising his expertise, experience and equipment. The service can include identification/scooping, implementation, verification, monitoring, further refinement and so on. Jointly, Westnet Rail and John Holland are able to target a true long-term rail maintenance strategy for Westnet Rail's tracks.
iii) FreightLink - 1,100km of one pass grinding. Some of the lowest unit rates per finished km seen in Australia. A record set at 100.2kms finished in one 14hr shift. New 50kg rail, excellent track time, NCOP profiles, +-0.2mm tolerance. Vehicle stability issues largely resolved.

RG8 Grinding Machine

The procedures to procure the RG8 grinding machine were similar to that for the RG9 machine.

The advantages of the RG8 grinding machine are:

i) Value of flexibility
   a. Hirail
   b. Multi-gauge (BG, SG, NG)

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c. Switch grinding
d. Offset grinding

ii) Value of accuracy
iii) Tight sequence points
iv) Precision control
v) Angle control
vi) Machine speed control
vii) Stone down pressure control

Photo – RG8 Rail Grinder

The RG Grinding machine has a proven production record with:

i) Westnet
ii) ARTC
iii) Flinders Power
iv) Freight Australia
v) Works Infrastructure
vi) Yarra Trams
vii) Mainco (Connex)
viii) RIC / RailCorp
ix) PTA (Perth Urban)

Further Developments

To improve their rail grinding capability, John Holland is developing methods for:

i) Switch Grinding
ii) Offset Grinding
iii) Verification Tools, including:
a. Corrugation Analysis Trolley
b. EZ-2 Laser rail
c. BAR Gauge
d. Onboard real time laser measurement system

Other Equipment

In addition, to improve their total service package, John Holland are able to offer the dollowing:

i) Shoulder Ballast Cleaner
ii) Ballast Undercutter
iii) Mobile Flashbutt Welder(s)
iv) Surfacing
a. 09-32 CAT + Cross Plough
b. Unimat + USP regulator

A VIEW FROM AFAR - by Max Michell

Living in another colony fairly naturally provides a different point of view. Living in Sydney, self-proclaimed centre of the universe, has some significant advantages, but can also be very frustrating. It is my view that in fact the whole social and governance fabric here is still based on a guards and convicts culture – the government (and others) see themselves as having to deal with a population of irresponsible (if not criminal) lesser class people who cannot be trusted to do the 'right thing'. For instance in most states roadside signs read something like 'Speeding can cost you your life' but here they read 'Speeding is against the law'. The result of this culture is that there is an excess of legislative zeal that makes normal business and social behaviour just that much more difficult. Everything is regulated to the point that actually achieving anything, be it a major development or minor maintenance is difficult, slow and in some cases is never actually achieved at all. Planning on the other hand is all short term, and at least at the level of the 'guards' is rarely ever comprehensive or taken to a logical conclusion. Railway people who have even a passing awareness of the rail history in this state will know of examples of what I am referring to.

Which brings me to my issue for this issue – possessions; the practice of shutting the railway down in order to provide for a better service. The passenger railway here is basically a major suburban network, over-laid by an inter-urban system that reaches out to over 200 km. Most of the network is electrified with only three segments left operated with diesel multiple units. There are no loco hauled trains left here; all equipment is reasonably high performance multiple units suited to stop start operation. The basic suburban off peak pattern is either 15 or 30 minutes with the inter-urban frequencies being 60 to 120 minutes. Which is to say that while there are reasonably frequent services on all lines, in most cases they hardly tax the capacity of the track. Only in peak periods does track capacity become a widespread issue.

Inevitably the issue of track maintenance comes up, which here is apparently planned and overseen by 'guards' who require the system to be shut down for such activity. Most weekday evenings there are 'after 21.30' shutdowns somewhere in the metro area, while just about every weekend there are total shutdowns of one large part or another of the network. Shutdowns are in fact just another form of unreliability as far as the travelling public is concerned. Deliberate, institutionalised unreliability.

A recent instance has been on the Newcastle line. All electric passenger trains apart from a few in the peak ran only from Sydney to Morisset (40 km short of Newcastle) for a fortnight, with buses substituted on extended schedules to cover the absent trains. On the intermediate weekend (Queens Birthday Holiday weekend) the whole of the Newcastle line north of Strathfield, all the North Shore and Hunter Valley passenger lines were shut down. As it happened I had to go to Newcastle in the middle of this, but when I saw the amended arrival times, and having heard some horror stories of dysfunctional coordination of trains and buses, I made the safe choice to go by road. As no doubt did quite a few other people for whom a reliable arrival time was important.

I normally go by train when possible and even on weekends will do so for purely social outings (Blue Mountains and Illawarra have both been in this category). However when planning such outings it is essential to have the current weekend shutdown program if the journey is to be by uninterrupted train and not a cobbled together temporary bus service. The road network being what it is here the train can often be similar in time to car, so weekend longer distance trains can attract a good number of punters on a good day.

There is a billion dollar project here (nothing is done by half measures – the 'guards' again) to create Rail Clearways – separation of the various metro services so a failure on one will not cross infect the whole system. Despite this the existing train services are a confused set of curious routings, variable stopping patterns and wobbly frequencies that must be designed to achieve the very thing that the billion dollars is being spent to avoid. Just to highlight how specious the plan might be, a few weekends ago there was Operation CBD where all the city rail lines inboard of MacDonaldtown and North Sydney were shut down for the weekend. If it was really necessary to shut this part of the system down (in other words if the same thing could not have been achieved by a more selective approach) then the Clearway project is bound for failure, since all the Clearway routes at some stage will still require access to the city area over shared tracks. In other words if the overhead comes down on a Blue Clearway train at Redfern, or a passenger leaves his bag unattended in a Red Clearway train at Central the system will be brought to a stand just as effectively as now.

I understand that shutdown of the Port Adelaide line to lay concrete sleepers a couple of years ago resulted in a downturn in passenger numbers that took a much longer time to recover once normal service were resumed. Easy to lose and hard to regain. I strongly suspect that the Victorian Regional Fast Train project (which has had long closures on the four RFT routes) will find the same thing. Sydney has experienced a small but significant downturn in rail passenger numbers lately (which was in part spin-doctored as coming out of the shadow of the 2000 Olympics) which probably is related to the appalling performance of the network – late running, missed stops and cancellations are normal daily events, and these attract a consistent and lively bad press here. But I have a theory that in fact the perennial shutdown of the system (to provide better services on' your' line no less) are at the core of the lack of growth in passenger numbers over a long time on what is a comprehensive and potentially very good network. For the last 30 years 'possessions' have been a frequent and irritating part of Sydney's train services such that I would expect that the passenger numbers, which after all are not all that different to those achieved when Sydney had less than half its current population, have been significantly set back compared to what they might have been if concentration had been on passenger service rather than engineering convenience. Because after all it is the engineering profession, at least here in this state, in this culture, and in this railway that have been primarily responsible for this sad state of affairs. This is not to denigrate the individuals, most of whom are entrapped in a system not of their making, but rather the culture and skewed focus that applies here. Engineering convenience ahead of public amenity. If the billion dollars was in part devoted to a change in maintenance practices and removal of the entirely manageable complexity of the schedules (both within the domain of management rather than capital) then I suspect that most of the problems would be solved more effectively than by just casting money around. The outcome could be a considerable lift in the amenity that the rail travelling public perceive such that long-term growth would then be achieved. The alternative might be simply to divert the whole RailCorp office structure into bus operation and hire in a management group from elsewhere who really care about running the railway for the benefit of the city and its long suffering 'convicts'.

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Glenelg Tramline Upgrade Progress

The upgrade of the Glenelg Tramline Trackwork commenced on June 6th with the commencement of a planned 8-week shutdown.

At present, large sections of the tram track has been removed to allow for formation strengthening in preparation of the laying of new ballasted track with concrete sleepers.

Other significant works includes the renewal of the many road crossings along the tramline. The Greenhill Road crossing was renewed on the June long weekend and the Morphett Road crossing the weekend after. Other major road crossings that will be renewed are:
Cross Road – 25, 26 June
Marion Road – 2, 3 July
South Road and Leah Street – 9, 10July
Goodwood Road and Beckham Street – 16, 17 July

Improvements and modifications to tram stops to make them compatible to the new trams are also proceeding.

During the shut down, the existing "H" Class trams are being modified to allow them to operate from the modified tram stops.

The re-opening of the tramline is planned for 7th August.

Eight new trams are planned to enter service in November. Five of the existing "H" Class trams will be retained.

MEETINGS FOR 2005

Future Speakers/Dates/Topics				
Date	**Speaker**	**Organisation**	**Topic**	**Venue**
03/03/05 (joint PWI)	Max Shuard	Transport SA	Port River Expressway	Hosted by PWI. Riviera Motel and Function Centre
07/04/05	Malcolm Owens	ARTC	ARTC Expansion into NSW	Engineers Australia Chapman Hall
05/05/05	Robb van Toledo	John Holland	The new RG9 Rail Grinder	Engineers Australia Chapman Hall
No Meeting in June				
07/07/05	**Dean Philips**	**TransAdelaide**	**Re-Tendering of TransAdelaide's Railcar Maintenance Contract**	**Engineers Australia Chapman Hall**
04/08/05	Rob Schweiger	RTSA	Review of Heavy Haul Conference-Brazil	Engineers Australia Chapman Hall
01/09/05 (joint PWI)	Dean Lambert	Trans Adelaide	New Trans Adelaide Trams	Engineers Australia Chapman Hall (RTSA to host)
06/10/05	TBA	TBA	Upgrading of Glenelg Tram Infrastructure	Engineers Australia Chapman Hall
27/10/2005	Railway Quiz Night	PWI	Open to RTSA members	Riviera Motel and Function Centre
03/11/05	TBA	TBA	New CTC System for Trans Adelaide	Engineers Australia Chapman Hall
29/11/05	Annual General Meeting of RTSA - SA Chapter		Dinner meeting	

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Articles or editorial comment for Newsletter are very welcome. We have over 100 members locally some of whom will have stories, events or developments of interest that could be reported in 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.

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Electronic despatch of Newsletter is undertaken by Malcolm Menadue – contact Malcolm on mmenadue@ozemail.com.au if you have any problems receiving Newsletter electronically or in hard copy. Note that electronic subscribers will get their Newsletters and flyers as soon as the editorial stuff is done, while the hard copy mail will of course be some days slower.

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