



JOINT RTSA/PWI CHAPTER MEETING:

Wednesday 4th November, Lunchtime Meeting

ARTC Investment Stimulation Package

Presented by Ben Leske, ARTC



Venue: Hilton Hotel, Mile End, cnr South Road and Sir Donald Bradman Drive

Time: 1200 - 1400hrs

Light refreshments will be served following the presentation.

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Chapter Meetings

Wednesday 4th November 2009

Lunchtime Meeting, hosted by the PWI, Ben Leske presents on ARTC's Investment Stimulation Package 12-2pm. Hilton Hotel, Mile End.

Late November / Early December 2009

PWI Field Visit to South Road Tram Overpass. More details to follow.

Tuesday 1st December 2009

Annual Dinner Meeting + AGM, Hyde Park Tavern. See flyer, registration form and AGM business papers distributed with this Newsletter for details.

Monday 4th February 2010

Joint RTSA/PWI Field Visit – Dry Creek Maintenance Depot. Hosted by the PWI.

Note: Meetings in the calendar for later in 2010 are in the process of being confirmed. More details to follow in the Newsletters as they become available.

Publisher

This newsletter is a publication of the South Australian Chapter of the Railway Technical Society of Australasia, Engineering House, 11 Bagot Street, North Adelaide SA 5006. Opinions expressed within are not necessarily those of the Chapter, Society or Editor.

Contributions

Contributions, including news, opinions, or letters to the editor, are always welcome. Send material by e-mail to sa-editor@rtsa.com.au

Continuing Professional Development

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

RTSA Website

The RTSA website www.rtsa.com.au has details of RTSA activities, including future meetings and reports from past meetings, for all Chapters.

Membership

Information for potential new members and an application form may be found at www.rtsa.com.au.

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Newsletter Dispatch

Despatch of the newsletter is undertaken by Steve Torok. Contact Steve on storok@tge.com.au if you have any problems receiving newsletter electronically or in hard copy, or change your e-mail address.

News

SA Chapter Meeting October 1st, 2009

The last Chapter meeting provided attendees with a presentation from a very different perspective when Lucky Soegito talked to us on the topic of Accident Investigation in Indonesian Railways. The slides relating to this presentation are attached to this Newsletter.

2010 RTSA Annual Railway Engineering Awards

Nominations for the 2010 Engineering Student Thesis Award and the Contact Mechanics Award will close on 27th November 2009. The cash prize component for both of these awards has been increased to \$4000 and full details can be found on the RTSA website: www.rtsa.com.au

Coming Events

AusRail Plus 2009, Adelaide

Between 17th-19th November, Adelaide will host the largest annual rail event in the Asia Pacific region, AusRail Plus, at the Adelaide Convention Centre. With trade exhibitions, networking functions and a program of international speakers, this 3-day conference will be the biggest rail event of 2009.

Full details can be obtained from www.ausrail.com/informa0z/AusRAIL/

RTSA National AGM

The RTSA's National AGM will be held on Tuesday 17th November at the AusRail Plus Conference at Adelaide Convention Centre, North Terrace, Adelaide SA and is open to all current financial members.

RTSA South Australia Annual Dinner and AGM

Our Annual Dinner and AGM is being held on Tuesday 1st December, Hyde Park Tavern at 7pm for

7.30pm. Guest Speaker is Mark Carter from GRMS Media who will be presenting on the topic of 'Taking the Scenic Route', including some famous and not so famous rail journeys in Europe, Africa, Asia and Australia. If you are planning on attending, please get your registration forms in ASAP! Registration forms are being circulated with this Newsletter along with an event flyer.

If your company is interested in sponsoring this event, please contact our Treasurer, Michael Forbes. Sponsorship costs \$400 (inclusive of GST) and includes 2 complimentary dinner invitations plus the display of your company logo on promotional material on the evening.

CORE 2010 – Wellington, NZ

The RTSA's biennial Conference on Railway Engineering (CORE) is to be held next year in Wellington, NZ with the theme 'Rail – Rejuvenation & Renaissance'. Registration for Abstract Submissions is open now until November 29th 2009. For more details please see <http://www.core2010.org.nz/>

Chairman's Chatter

Although Australia is a large continent, its rail network is, by world standards, more modest. Our 45,000 km of railway compare with 266,000 km on just the Class I railroads in the USA alone. The largest operators there have more trackage than in the whole of Australia. And the North American wagon fleet totals over 1.5 million vehicles.

Nevertheless, Australia contributes positively to the world-wide industry, probably to a greater extent than the scale of its local operations would suggest. The globalisation of world commerce and trade is increasing available opportunities.

Australia's competitive advantage lies in niche areas, such as the development and implementation of technology, rather than as a direct competitor in the manufacturing sector. Even in the latter area, however, there have been successes. For example, Australian turnout manufacturers have successfully serviced the Asian market for transit developments, although this field has in recent times been subject to increasing price competition from other countries. Our major infrastructure construction contractors have also had successes in this region.

But it is in the field of advanced technology where Australia has been most successful. For example, in the areas of wayside monitoring, and driver simulation training, Australia is recognised as being towards the forefront of worldwide developments. With technologies developed here in Adelaide, no less.

A number of Australian engineering consultancy organisations have built up a significant offshore presence, both in the areas of traditional project feasibility studies, development and implementation, and in the more specialist fields of research and problem solving.

A major competitive advantage for Australia relates to the technologies associated with heavy haul

operations. In this specialist field, Australia, North America and perhaps Brazil stand out as world leaders, with others progressively catching up. Our gains in higher axle loads, longer rail life, heavier trains, and continuously improving asset utilisation, set benchmarks for other to follow. In fact, in 2001, Australia set a world record by operating a 99,000 tonne 7,400 m long iron ore train comprising 8 locomotives and 682 wagons. Albeit, this was not intended to be the start of regular operation of such trains.

Visitors to North America have for many years reported that Australian general freight, passenger and heavy haul operations compare most favourably with those overseas, and that North America has as much to learn from Australia as Australia has to learn from North America. In particular, city-to-city journey times for North American intermodal freight, with extended dwell times at intermediate locations, are a long way behind those achieved in Australia.

The interesting presentation by Lucky Soegito on railway accident investigation in Indonesia at our October meeting illustrated another aspect of Australia's contribution to the world-wide industry. By providing training opportunities to people from developing nations in our region, we are not only assisting the industry in those countries, but in a small way enabling a greater appreciation by Australian rail industry personnel (and RTSA members) of the circumstances and challenges faced by others.

Overall, it can reasonably be claimed that in a global context, the Australian rail industry punches well above its weight in many areas.

Duncan McLeod

Railway Accident Investigation in Indonesia – Lucky Soegito


The slides from this presentation can be seen on the following pages:



**RAILWAY ACCIDENT
INVESTIGATION IN INDONESIA**

Lucky B Soegito

 National Transportation Safety Committee
Ministry of Transportation



INDONESIA

Indonesia is an archipelagos country that has 17,508 islands located between two continents – Asia and Australia with estimated population of 237 million people

**BACKGROUND:
INDONESIA RAILWAY SYSTEM**

NTSC

- SINGLE GOVERNMENT OWNED OPERATOR (until now),
- 5.042 KILOMETERS narrow gauge track
- Laid on two main islands at Indonesia

**BACKGROUND:
INDONESIA RAILWAY SYSTEM**

NTSC



**BACKGROUND:
INDONESIA RAILWAY SYSTEM**

NTSC

2008

- 127 railway accident occurred
- 43 fatalities, 73 serious injuries and 73 minor injuries
- All accidents are investigated. Only small portion investigated by NTSC, remaining investigated by operator alone.

**NTSC:
ACCIDENT INVESTIGATION BODY**

NTSC

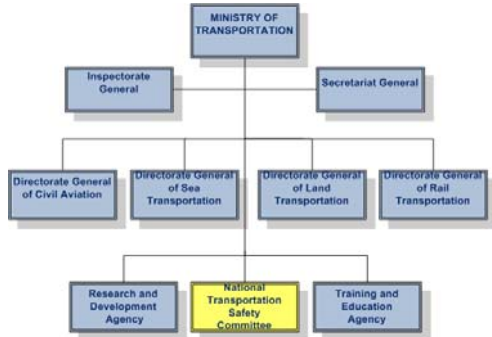
NATIONAL TRANSPORTATION SAFETY COMMITTEE

As consequences of being ICAO (International Civil Aviation Organisation) and IMO (International Maritime Organisation) members, Indonesia was recommended to have an accident investigation body .

NTSC was established by Indonesian Presidential Decree No. 105/1999 (Keppres No. 105/1999), as a permanent independent agency responsible to the Minister of Transportation. Previously accident investigations were conducted by each transport mode, not integrated in single agency.

NTSC: ACCIDENT INVESTIGATION BODY

NTSC



NTSC: ACCIDENT INVESTIGATION BODY

NTSC

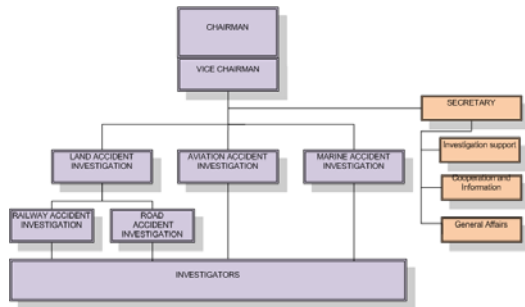
NATIONAL TRANSPORTATION SAFETY COMMITTEE

The NTSC is responsible for the investigation of safety deficiencies of **AVIATION, MARITIME** and **LAND TRANSPORT** (include **RAILWAY** and **ROAD** accident) in Indonesia.

Based on the results of accident investigations, the NTSC makes recommendations that should be taken to **PREVENT** the **RECURRENCE** of **SIMILAR ACCIDENTS**.

NTSC: ACCIDENT INVESTIGATION BODY

NTSC



NTSC: ACCIDENT INVESTIGATION BODY

NTSC

The sole objective of NTSC accident investigation is to prevent recurrence of similar accidents/incidents and not to apportion blame or liability

NTSC accident reports can not be used as evidence in courts of law.

Indonesian Minister of Transportation has appointed **16** professional experts from various backgrounds to work at NTSC as on call Rail investigators. They are mostly retired employees from Indonesian rail operator and not working daily at NTSC.

NTSC has also appointed **6** staff for investigation support to provide assistance to investigations carried out.

RAILWAY ACCIDENT INVESTIGATION: RAIL INVESTIGATOR

NTSC



RAILWAY ACCIDENT INVESTIGATION: LEGAL BASIS

NTSC

Indonesian Law No. 23/2007 on Railway

Ministry of Transportation Decree No. 82/2000 on Railway Accident Investigation

NTSC Railway Accident Investigation Guidelines (adapted from ICAO Annex 13)

RAILWAY ACCIDENT INVESTIGATION: TYPE OF ACCIDENT

NTSC

NTSC investigate occurrences defined as follow:

- An accident resulting in fatality or serious injury
- An accident with severe result:
 - 1) Major destruction to rollingstock or track infrastructure (*this has been defined in specific loss of 1.5 million rupiah or more*)
 - 2) Part or whole train derailed or involve in collision
 - 3) Train having severe damage caused through shunting
 - 4) Danger as result in train operation or shunting (includes near miss collision and run away train)
 - 5) Causes 6 hours of closing on particular track section where accident occurs (*≤ 6 hours and ≤ 1,5 million rupiah usually investigated by operator*)

RAILWAY ACCIDENT INVESTIGATION: TYPE OF ACCIDENT

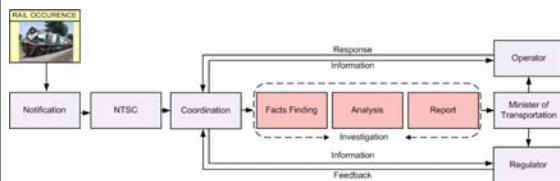
NTSC

NTSC will investigate Level crossing collisions

Level crossing collision investigations are conducted under Road Accident Investigation sub committee.

RAILWAY ACCIDENT INVESTIGATION: INVESTIGATION

NTSC



RAILWAY ACCIDENT INVESTIGATION: ACCIDENT DATA

NTSC

YEAR	NUMBER OF ACCIDENTS					INVESTIGATED BY NTSC
	Collision	Derailment	Level crossing collision	Others	Total	
2004	7	91	30	38	166	6
2005	10	66	15	8	99	11
2006	5	68	15	8	96	14
2007	3	117	20	2	142	14
2008	3	95	19	10	127	7

RAILWAY ACCIDENT INVESTIGATION: INJURIES

NTSC

Year	Number of passenger (million)	Fatal	Serious Injuries	Minor Injuries
2004	150	85	78	29
2005	152	36	85	111
2006	159	50	76	52
2007	175	34	128	164
2008	194	43	73	73

RAILWAY ACCIDENT INVESTIGATION SOME EXAMPLE

NTSC

- 1) Broken wheel
- 2) Derailment
- 3) Train structure collapse

BROKEN WHEEL (PASSENGER DIESEL TRAIN)

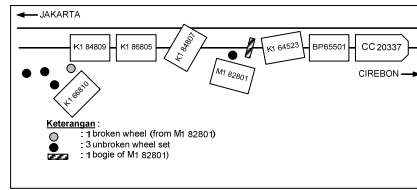
KA 84 Kamandanu between Lemahabang Station – Kedunggedeh Station, Western Java , 1 Aug 2003



KA 84 was a passenger train from Jakarta to Semarang, Central Java. Train was derailed at Bekasi area, Near Jakarta resulted 6 serious injuries and 12 minor injuries

EXAMPLE 1

NTSC



EXAMPLE 1

NTSC



EXAMPLE 1

NTSC

Crack started from wheel rim and propagated towards the centre. Dynamic impact caused wheel to fracture and broken.

Another wheelset from another vehicle was discovered with fracture post derailment. Temporary field repair made and wheel disintegrated at workshop.

Mark on head rail was revealed prior to POD. At that time, no procedure to check cracks on solid wheel (daily check, half yearly check and yearly check).

Cast iron brake pad was replaced using composite brake pad without considering coefficient of friction (in this case : 2 x higher). Result: thermal stress on wheel and causing thermal fatigue. In conjunction with track condition the train derailed.

EXAMPLE 1

NTSC

DERAILMENT

KA 1 Argo Bromo Angrek between KARANGJATI Station – GUBUG Station , 27 Oct 2003

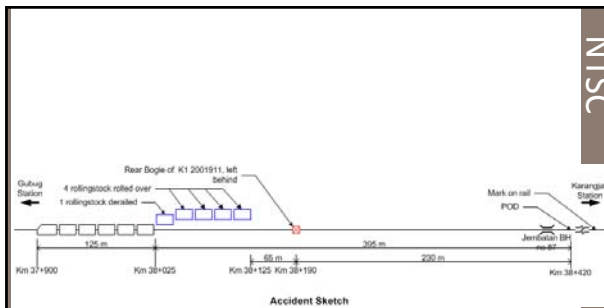


Train KA1 Argo Bromo Angrek was an executive train, routed from Surabaya (east Java) to Jakarta. Stop only at Semarang (central Java)

It was travelling 85 km/h when it started to derail. Maximum speed on passage from Surabaya to Semarang was 95 km/h.

EXAMPLE 2

NTSC



EXAMPLE 2

NTSC

NTSC

K9 Bolsterless type bogie, manufactured in 1997 and 2001

EXAMPLE 2

NTSC

Poor track condition resulted in excessive suspension travel of K9 bogie (causing conical rubber spring, connection rod and anti roll bar, sling and M bracket failure).

There was no speed restriction in the track section although track surveys conducted 3 months prior to accident. Type of track was class III ($35 < TQI \leq 50$) and recommended speed 60 – 80 km/h.

EXAMPLE 2

NTSC

COLLAPSE – TRAIN STRUCTURE COLLAPSE

K3 81102 ex KD3 81203 at Kebayoran Lama yard, Jakarta, 3 March 2006

Passenger train KA 907 loco hauled economy class, was travelling from Rangkas Bitung (west Java) to Jakarta during peak hours. Reported full load of passengers inside carriage and on roof when the carriage collapsed. 10 serious injuries and 19 minor injuries as result of accident.

EXAMPLE 3

NTSC

Train was modified from diesel powered passenger car to a non powered passenger carriage on December 2003. Strengthened on its buffer and control valve braking system added.

EXAMPLE 3

NTSC

Originally 3 doors on each side were modified to 2 doors each side.

Modification was made to 31 similar carriages, 13 were reported having deformation on centre underframe (bended and cracking).

Investigation revealed the deformation was caused by poor welding techniques applied when modification made to doors.

Engineering design and certification for modifications and post inspection were never found during investigation.

EXAMPLE 3

NTSC

COLLAPSE – TRAIN STRUCTURE COLLAPSE

KA 128 (Parcel/postal) between Sulur Station – Kradenan Station, Central Java on 13 September 2006

Corrosive; train was made in 1958

EXAMPLE 4



NTSC

KA 128 was a freight train (postal), routed from Surabaya (east Java) to Jakarta freight terminal.

The wagon collapsed in service at Semarang, Central Java (about 300km from Surabaya Station). Underframe was found severely corroded

No regular road worthiness records of inspection found for this wagon.

EXAMPLE 4

NTSC: INVESTIGATION

NTSC

Sequence of investigation:

1. Facts finding
2. Analysis
3. Define causing factor
4. Recommendation to prevent recurrent of similar accident



NATIONAL TRANSPORTATION SAFETY COMMITTEE

NTSC



Train KA 17B hit group of people at railway corridor, Jakarta
19 April 2005
6 fatalities and 9 major injuries



NATIONAL TRANSPORTATION SAFETY COMMITTEE

NTSC



Derailed of coal train KA BBR 21 at South Sumatra
17 December 2003
7 coal train derailed (28 axles)



NATIONAL TRANSPORTATION SAFETY COMMITTEE

NTSC



Level crossing collision between passenger train and bus at Sragen, Central Java
16 Juni 2003
Bus driver and 14 passenger were fatally injured




NATIONAL TRANSPORTATION SAFETY COMMITTEE

NTSC



Derailed of KA 125 passenger train at Butuh, Central Java
28 March 2004
8 carriages derailed


NATIONAL TRANSPORTATION SAFETY COMMITTEE



Derailment of KA 8476 passenger train at Purwakarta, West Java
24 Januari 2004
5 carriages derailed

NTSC


NATIONAL TRANSPORTATION SAFETY COMMITTEE



Derailment of KA 174 passenger train at Suradadi, Central Java
7 April 2007
7 carriages derailed; 2 fatalities and 23 serious injuries

NTSC


NATIONAL TRANSPORTATION SAFETY COMMITTEE



Collision between train KA 583 and KA 585 electric passenger train at Jakarta
30 June 2005
5 fatalities, 40 serious injuries and 73 minor injuries

NTSC

NATIONAL TRANSPORTATION SAFETY COMMITTEE



Collision between train KA 155 and KA 39C passenger train at Terisi yard, west Java
3 June 2005
Locomotive of train KA 155 severely damaged and 1 carriage derailed; 1 carriage from train KA 39C damaged

NTSC

NATIONAL TRANSPORTATION SAFETY COMMITTEE



Driver cabin

NTSC

NATIONAL TRANSPORTATION SAFETY COMMITTEE



NATIONAL TRANSPORTATION SAFETY COMMITTEE
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NTSC