National Rail Safety Investigations in Australia

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SUMMARY

Rail safety regulation and investigation in Australia has recently undergone significant reform. The outcome has been the creation of a national rail safety regulator, while the Australian Transport Safety Bureau (ATSB) has been recognized as the national rail safety investigator.

From 20 January 2013, most but not all Australian States began participating in the new national approach for rail safety regulation and investigation. Not only has the ATSB's investigation role expanded, but the ATSB has also taken on the role as the lead agency receiving notifications for the more serious incidents involving derailment, collision, death and serious injury.

The national approach to rail safety has provided the opportunity to better assess and analyse incident data for a more efficient decision making process and for initiating investigations across a greater range of safety matters. As safety trends and patterns emerge, the ATSB can provide information to the Australian rail industry aimed at prevention of broader, systemic safety problems.

The ATSB's SafetyWatch initiative is a tool for communicating safety concerns across the aviation, rail and maritime modes of transport in Australia. For rail, the highlighted risk area is 'Safe work on rail', an issue prompted by a series of incidents, one of which resulted in the death of a track worker. With an improved ability for better assessment and analysis of incident data, the ATSB expects to provide further information to the Australian rail industry aimed at prevention of broader, systemic safety problems.

Rail transport, especially freight, has a major role to play in Australia's national economy. It is only logical that the safety of a system having such national importance be managed with a national focus. It is expected that the implementation of a national rail safety regulator and adopting the ATSB as the national investigator will bring a more national approach to ensuring safety over Australia's railway networks.

INTRODUCTION

Rail safety regulation and investigation in Australia has undergone significant reform over recent years, but the need for change probably originates from early development of railways in Australia.

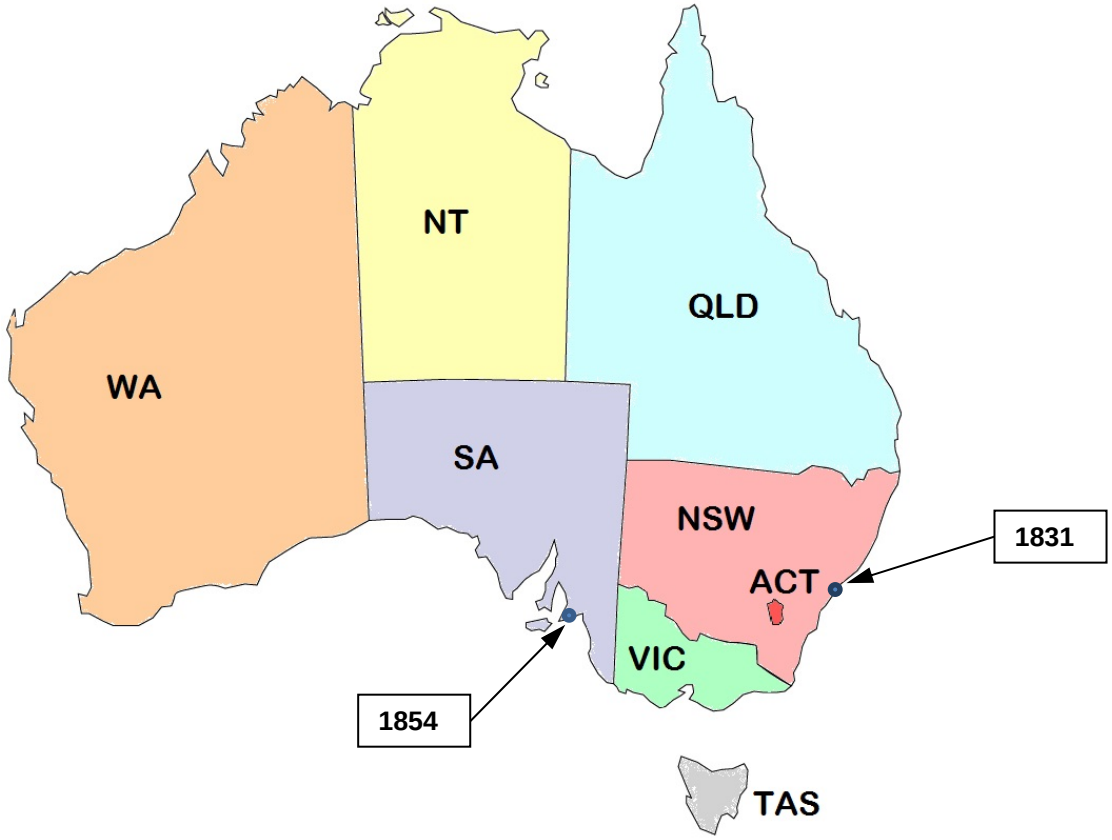
Figure 1: Derailment – Early Australian railways

RAILWAYS IN AUSTRALIA

Railways in Australia date back to Australia's early colonial days. Government in Australian had developed as six separate self-governing colonies (Queensland, New South Wales, Victoria, Tasmania, South Australia, and Western Australia). The first railway in Australia was privately owned, Newcastle (New South Wales) in 1831. The first government railway was in South Australia in 1854 with the other States of Australia following throughout the second half of the 1800's.

The Federation of Australia was the process by which the six colonies formed one nation. Each colony kept their systems of government but a federal government was developed to take responsibility for matters concerning the whole nation. The process of federation was heavily debated during the 1890's and one of the discussion points was that the railways should be a federal responsibility. However, the individual colonies were very cautious about delegating power to a national government, a condition that exists in Australia to this day.

Figure 2: Australia



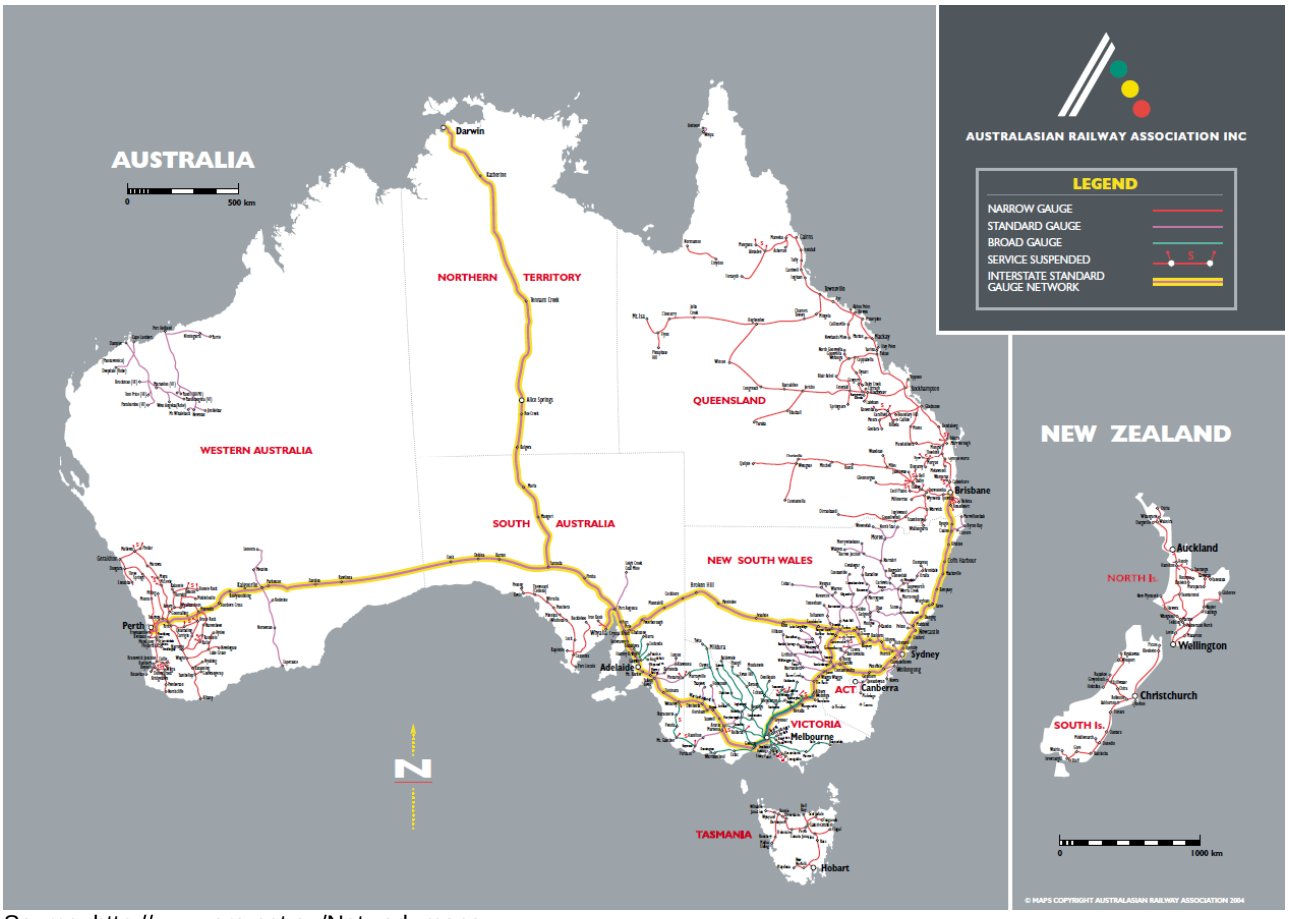
On 1 January 1901, the six colonies along with two federal territories (The Australian Capital Territory and the Northern Territory) collectively became part of the Commonwealth of Australia. However, the vote on federal control of railways was narrowly lost, so the railways remained a State responsibility.

Railways continued to expand, but each State had adopted (in general) one of three different track gauges.

- Narrow gauge (1067 mm or 3 ft. 6 in.)
- Standard gauge (1435 mm or 4 ft. 8 ½ in.)
- Broad gauge (1600 mm or 5 ft. 3 in.)

As railways extended out to State borders, a conflict in gauge often occurred, requiring a change of train for journeys between capital cities. It was not until 1995 that a continuous standard gauge railway was available between all five mainland (State) capital cities and to Darwin (Northern Territory) in 2004.

Figure 3: Railways in Australia



Source: http://www.ara.net.au/Network-maps

RAIL SAFETY REGULATION IN AUSTRALIA

Also, in 1995, as part of a broader reform process, an agreement was reach between the States for the development of State based rail safety regulators. The result was seven different rail safety regulators, each administering different State based laws and processes to regulate safety for Australia's rail system.

About a third of Australia's rail industry had operations across multiple States, requiring them to deal with two or more regulators. While there was reasonable cooperation between each regulator to ensure consistent application of rail safety law, there were still inefficiencies (real and perceived) for rail organisations. The need to manage differing State requirements added unnecessarily to the compliance costs of rail operators and diverted resources away from their end goal, which was to operate safely and efficiently.

In 2006, the process of introducing a national rail safety regulator began. By 2009, the States had agreed to the establishment of a national regulator and, on 20 January 2013, the Office of the National Rail Safety Regulator opened.

Figure 4: Office of the National Rail Safety Regulator

OFFICE OF THE
national rail
safety regulator

RAIL SAFETY INVESTIGATION IN AUSTRALIA

Similar to regulation, rail safety investigation has traditionally been a State responsibility. However, with the inception of the Australian Transport Safety Bureau (ATSB) in July 1999, followed by the enactment of the Transport Safety Investigation Act in 2003, Australia had for the first time a national body with a mandate for rail safety investigations.

Figure 5: Australian Transport Safety Bureau

The ATSB is an independent Commonwealth Government statutory Agency. It is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through independent investigation of transport accidents, recording and analysis of safety data, and research investigations.

From 2003, the ATSB conducted investigations into rail accidents, but as a federal organisation, generally focused its attention towards national operations. That is, rail accidents that occurred on the railway lines linking Australia's mainland capital cities, the network commonly referred to as the Defined Interstate Rail Network.

Similar to the reforms to rail safety regulation, 2006 saw the beginning of a process for introducing an investigator responsible for all rail safety investigations in Australia. It was agreed that the ATSB would become the national investigator and, on 20 January 2013, the ATSB's jurisdiction expanded from the main interstate lines to also incorporated metropolitan and intrastate railway lines.

2013 has seen a period of transition to the new national approach for rail safety investigation. From 20 January 2013, most but not all States began participating in the national rail safety regulator and investigator.

New South Wales and Victoria were the only States that had state-based investigators prior to 2013. These State agencies now conduct investigations (in their States) under federal law on behalf of the ATSB. The ATSB provides assistance and technical resources if necessary. Conversely, these State base agencies have also provided assistance to the ATSB, especially where they have been better placed to provide a prompt on-site response.

In South Australia, Tasmania and the Northern Territory, the ATSB is now responsible for conducting rail safety investigations over all lines within those States. Western Australia and Queensland are yet to sign-up to the national regulator and investigator reforms, but the ATSB is hopeful this will occur late in 2013 or early 2014.

INCIDENT NOTIFICATION

Before 2013, rail operators were required to notify the relevant State based regulator of any rail safety incidents within that State. The State regulators then notified the ATSB of the more serious incidents where an investigation may have been necessary. This meant, that for the seven State based regulators, there were seven notification regimes. Consequently, organisations that operated across multiple States were required to notify (multiple) regulators depending on where the incident occurred.

From 20 January 2013, the ATSB became the single national incident notification agency for all 'Category A' incidents occurring in most states and territories (noting that some States were yet to participate in the national scheme). Category A are the more serious incidents (derailment, collision, death and serious injury) whereby rail organisations a required to provide immediate verbal notification (phone call). The less serious 'Category B' incidents require written notification to the National Regulator within 72 hours.

All notifications are now consolidated into a national system which provides a simplified notification regime for rail operators. In addition, it provides consistency of data for the assessment and analysis of incidents and will allow for a more efficient decision making process for initiating investigations across a greater range of safety matters.

From mid-2013, a review of the Category A incident notification definitions was conducted. The intent has been to better define the incidents that require immediate action from a regulation or investigation perspective. In the past, the incidents defined as Category A have encouraged reactive safety improvement rather than pre-emptive safety improvement. The review has also considered immediate notification of incidents that could be considered pre-cursor events to a more serious event that may increase the risk of death or serious injury.

For example, in the past, investigation effort has predominantly been directed towards serious incidents that have resulted in derailment, collision, death or serious injury. In the future, the ATSB will also direct effort towards incidents that increased the risk of derailment, collision, death or serious injury, but in that instance did not result in derailment, collision, death or serious injury.

SafetyWatch – Safe work on rail

The introduction of more consistent national incident data provides the ability for better analysis and the identification of safety trends and patterns. The ATSB can use the information to discover and prevent broader, systemic safety problems.

In late 2012, the ATSB introduced its SafetyWatch initiative. SafetyWatch highlights the broad safety concerns that have come out of investigation findings and analysis of incident data. There are a series of nine identified safety concerns across the aviation, rail and maritime modes of transport in Australia. SafetyWatch provides information about each safety concern, strategies to help manage risk areas along with links to safety resources. The ATSB will add or remove topics to reflect current information on safety trends and occurrences.

Figure 6: ATSB SafetyWatch

For the rail mode of transport, SafetyWatch highlights ‘Safe work on rail’ as an area of concern and summarises the issue as:

> *Safety concern*
>
> *The ATSB has investigated several accidents that have occurred when maintenance work was being carried out on or near railway tracks. Conducting work on or near a railway track can be dangerous if safeworking rules and procedures have not been correctly implemented to protect the worksite. Trains cannot stop quickly and any breakdown in the communication or management of a worksite can leave workers extremely vulnerable to dangerous situations.*
>
> *What can you do?*
>
> *Operational safe working on track requires a high level of preparation and organisation. Whenever there is work taking place on or near a track, coordination and communication are essential. Before authority is granted to occupy or work near a track, it is essential that all information is clearly communicated and verified between the Protection Officer and the Network Control Officer.*
>
> *An adequate briefing about the work site and effective communications equipment must be made available to the track workers. For track workers, it is vital to ensure that all levels of worksite protection have been fully implemented before commencing work on or near the track.*

SAFEWORKING INCIDENT – NEWBRIDGE (NSW), 2010

One of the incidents (investigated by the ATSB) that prompted the inclusion of 'Safe work on rail' in SafetyWatch was a collision between a train and track workers near Newbridge in New South Wales. This was just one of a number of similar incidents, though the consequence of this incident was much more severe.

What happened

At about 1116 on 5 May 2010 a collision occurred between an XPT passenger train and a track-mounted excavator. The operator of the track-mounted excavator was fatally injured.

Figure 7: ATSB SafetyWatch

During the course of the investigation a similar incident occurred near Wards River, New South Wales (17 March 2011), where two work groups had to hurriedly vacate their on-track worksite due to an approaching train (there were no injuries). Both incidents occurred despite the fact that the work groups had been authorised, under a Track Occupancy Authority (TOA), to occupy and work on the track.

What the ATSB found

Train movements through Newbridge were controlled by fixed signalling operated from a remote network control centre. Signals display the authority for train movements and track circuits detect train location, while the control centre provides real time monitoring and control of the field hardware. However, the system relies on the ability to electronically 'see' trains on the network, determine conflicts and control the signals appropriately.

Workers accessing the track for maintenance purposes are often not detectable or controllable by the signalling system. Consequently, a different communication based method of safeworking is required. In this case, a TOA relies on verbally communicated information to ensure separation between rail traffic and track workers. However, it is essential under this system that all information that is critical to the TOA process is clearly communicated.

The ATSB established that, for the accident at Newbridge, a TOA was an appropriate method of authorising the work to be performed. However, a combination of individual actions and systemic issues contributed to the collision. When requesting the TOA, neither the Protection Officer (PO) nor the Network Control Officer (NCO) positively identified the location and type of worksite. Their actions were influenced by a deficiency in the TOA form, in that no provision was provided to record this critical information. Consequently, both the PO and NCO incorrectly concluded that a train, already within the track section, had passed beyond the limits of the worksite. In addition, the workers accessed the danger zone before additional site protection measures (detonators and flags) had been put in place. The ATSB also found that the workers were relatively inexperienced and that their training had not specifically discussed the hazards and protections that were relevant when working under a TOA.

The scenario for the Wards River incident was similar in that the PO did not clearly identify the location of the worksite and the NCO did not ensure a train already within the track section had passed beyond the worksite or track access point.

What has been done as a result

As a result of the incident at Newbridge on 5 May 2010, the operator took action to reinforce the rules and procedures associated with the issuing of TOAs. The operator also implemented the use of a revised TOA form that provided for the recording of critical information regarding the location and type of worksite. It is likely that implementation of the new form should reduce the risk of similar incidents.

Safety message

The ATSB highlighted the following safety message:

It is essential that information critical to the safe implementation of a TOA be clearly communicated between the Protection Officer and the Network Control Officer.

It is also essential that workers do not access the track until all levels of worksite protection have been fully implemented.

CONCLUSION

The Australian system of rail safety regulation and investigation has undergone significant reform over recent years. The outcome has been the creation of a national rail safety regulator, with the Australian Transport Safety Bureau (ATSB) recognized as the national rail safety investigator.

The reforms have provided the opportunity for a more national focus on rail safety, and now provides for a single point of call for incident notifications. The ATSB has been proactive in a number of ways, one being the implementation of its SafetyWatch initiative. With an improved ability for better assessment and analysis of incident data, the ATSB expects to provide further information to the Australian rail industry aimed at prevention of broader, systemic safety problems.

Rail transport, especially freight, has a major role to play in Australia’s national economy. It is only logical that the safety of a system having such national importance be managed with a national focus. It is expected that the implementation of a national rail safety regulator and adopting the ATSB as the national investigator will bring a more national approach to ensuring safety over Australia’s railway networks.