



AUSTRALASIAN RAILWAY ASSOCIATION INC

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Submission to
The Australian Federal Government
Senate Enquiry

“The shortage of engineering and
related employment skills”

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Introduction

About the ARA

The Australasian Railway Association (ARA) is a member based organisation and peak body representing the interests of all rail operators, private and government, passenger and freight operators, track owners and managers, manufacturers of rolling stock and components, and other aspects of the rail industry across Australia and New Zealand. A primary goal of the ARA is to illustrate and promote the positive impact that railways have on the economy, society and environment of Australasia and act as an industry voice on important issues.

Industry Overview

The Australian Rail Industry directly employs over 40,000 men and women in diverse occupations throughout urban and regional Australia. Many more people work in supporting industries providing goods and services to the industry (estimates place the number at almost 100,000 people)¹. This includes the manufacture of rollingstock and infrastructure construction.

Traditionally the rail industry has been viewed as employing train drivers, station staff and track workers. The reality is that is a very diverse industry employing engineers and technicians from a wide spectrum of experience and knowledge. Industries that support rail and employ engineers include the construction of rolling stock, maintenance and construction of track infrastructure, engineering services and component supply, radio and digital communication, project management and consultancy.

The rail industry is in a period of expansion in both freight and passenger operations and “investments in infrastructure have been increasing and are expected to continue to grow”².

Total freight carried by Australian rail increased by 5.2 per cent in 2008/09 and a further 12.9 per cent to 853.5 million tonnes in 2009/10³. Most of this growth has been in the Iron Ore and Coal supply chains. As at 2009/10, ore contributed 48.3 per cent of the national rail tonnes, followed by coal (37.3 per cent), other bulk products (6.7 per cent), sugar (3.2 per cent), bauxite (2.1 per cent), non-bulk products (2.1 per cent), and steel (0.3 per cent)⁴. In simplest terms this results in a new train set of locomotives and wagons going across the network each week. It also involves the construction of new tracks and infrastructure.

In urban passenger operations across Australia rail is also seeing exponential growth with increases in patronage of 6.1% each year since 2008 undertaking 769.9 million travelling journeys in 2010⁵. This means an added 60,000 people are on the rail network every week.

While the rail industry is experiencing significant growth and demand for increased employment it is doing so in a constrained skilled market influenced by the resource sector boom. Like all industries with a skilled workforce, rail is facing numerous shortages, particularly in the engineering discipline. There are many engineers required in rail, from a wide variety of backgrounds including Civil, Mechanical, Structural, Electrical, Telecommunications and Environmental Engineering. “The Rail engineering workforce resembles the whole engineering workforce in many respects, suggesting that its skill capacity problems may reflect broader structural and labour supply problems afflicting the engineering profession as a whole”⁶.

Addressing the Terms of Reference

This submission is made on behalf of members of the Australasian Railway Association (ARA) and in support of the submission made by the Australian National Engineering Taskforce (ANET).

The ARA's submission responds directly to the Senate's terms of reference pertaining to rail related issues incorporating "the nexus between the demand for infrastructure delivery and the shortage of appropriate engineering and related employment skills in Australia, with particular reference to:

(a) the implications of the shortage for infrastructure delivery in terms of economic development, cost, efficiency, safety and disputation;

(b) the impact of the long-term outsourcing of engineering activities by government on skills development and retention in both the private and public sectors;

(c) options to address the skill shortage for engineers and related trades, and the effectiveness and efficiency of relevant policies, both past and present;

(d) options for infrastructure delivery using alternative procurement models which aim to foster collaboration and achieve effective community outcomes, including skills development and retention;

(e) effective strategies to develop and retain engineering talent in the private and public sectors through industry training and development, at enterprise, project and whole-of sector levels;

(f) opportunities to provide incentives to the private sector through the procurement process to undertake skills development;

(g) consequences of skills shortage in the construction sector to the public sector's capacity to effectively procure and manage infrastructure projects;

(h) the impact of delayed and stalled infrastructure projects on economic development, workplace productivity and employment; and

(i) other related matters"⁷.

Current Issues and Recommendations

Infrastructure Delivery

Due to a number of issues government at all levels require efficient and reliable rail services to support the effective movement of both people and freight. With public concerns growing over the economic cost of capital city congestion, level of green house gas emissions and the escalating hazard of more and larger trucks on our highways, efficient rail is required more than ever to provide a viable solution to government⁸.

Australia's approach to the planning of cities, land use and transport has changed dramatically over the last half century as a result of population growth. Our major cities have expanded and their centres have grown denser. Demand for passenger and freight transport services have steadily grown, both within and between urban centres. The pressure on transport infrastructure is set to progressively intensify over the coming years as Australia's population increases to a forecast 30.5 million by 2030 (ABS 2008). In this environment, decisions must be made about how much and where to invest in transport infrastructure. These decisions must be informed by the true value of rail or the wrong investments will be made⁹.

It is not only projected infrastructure growth that needs to be considered, the recent spate of natural disasters in Australia has disrupted economic growth and resulted in significant damage to infrastructure¹⁰ which further adds to the demand for skilled engineers in rail, to rectify this damage.

The importation of labour has historically been a feature of Australia's response to skills shortages in Engineering¹¹ and the rail industry is no different. Rail has supported skilled migration to address the shortages and worked in conjunction with The Cooperative Research Centre (CRC) for Rail Innovation¹², to develop a website providing the rail industry with a one stop shop of information necessary for recruiting skilled migrants from both off shore and on shore¹³. However, considering this is an expensive option for employers and competition for rail engineers is global, with a number of large rail construction projects in Asia and the Middle East draining Australian capacity¹⁴; the rail industry will reach a point where this solution is not viable.

Recommendations

1. Reduce national reliance on skilled migration and focus on home grown talent to increase domestic supply. (refer to recommendations listed in Future Skills for Engineers and Technicians).

Training

Most Australian railways were government-owned and operated until recent years¹⁵. There are now considerably more industry participants and considerably greater private sector service provision¹⁶. As a result of this transition, “there was a significant structural shift within the rail industry which resulted in changes in how workers were recruited, trained and developed...the large scale training programs and resources sustained by the government owned rail organisations were subsequently substantially rationalised or viewed as a non-core part of operations”¹⁷; especially in the more technical areas (such as track and rolling stock maintenance) where services were increasingly being outsourced¹⁸.

Although the rail industry is accepting in its responsibility to train and develop young engineers and many have graduate programs in place, with one organisation reporting 69 out of 108 graduates in 2011 were for engineering¹⁹, with a retention rate of 80-88%. Industry acknowledges that whilst some larger sized rail employers are more likely to offer apprenticeships, traineeships, internships/cadetships and professional graduate recruitment programs²⁰, smaller organisations do not have the resources and the retention rates of programs vary. The increasing move to privatise across the rail sector is also contributing to less training to be undertaken. Commercial drives often constrain discretionary spending and training is affected. Also relevant is that the skill shortage results in there being few personnel available to supervise or undertake training. The government could provide tax incentives to companies to take on additional trainees and this would have a long term economic benefit to the economy.

Employers who had advertised in 2010 generally experienced difficulty filling positions but it is important to note they were commonly seeking qualified and experienced engineers (often requiring five to ten years or more of relevant industry experience)²¹.

Rail industry feedback supports this statement that organisations are generally not accepting graduates with less than 5 years experience, which is creating a significant gap in the skills pipeline now and into the future.

Compounding this problem is research showing that “the problem of an ageing workforce is being felt more acutely in the rail industry than the general workforce”²². Many of the engineers currently employed in rail are approaching retirement age²³. The rail industry has been aware of this issue for some time and taken steps to utilise mentoring and coaching to capture the knowledge and experience that will be lost through retirement, however this is not unique to rail with the “average age of the engineering labour force 41.9 years (42.5 years men and 36.6 years women) compared to 40.3 years for non-engineering skills (40.5 years men and 39.1 years women)”²⁴.

Recommendations:

1. Government incentive to increase the training of engineers and technicians; a scheme that assists the employer to undertake training and carry the additional cost to their operation would be most welcome. This issue could be further addressed but government to subsidise programs encouraging employment of grads with 1-5 years experience, provide tax incentives for cadetships undertaken and support of mentoring and coaching program for engineers incorporating local exchange activities across industries.

Data Collection

Accurate statistics are vital to ascertain the current availability of engineering and related skills in our workforce. Understanding what we have now is the key to future planning, providing realistic targets of what skills we need to develop to prepare for upcoming demand.

DEEWR and other government agencies make policy decisions based on the latest ABS data. Because this source is a survey, it has limitations when the survey population is disaggregated for occupational analysis because standard error problems are quickly encountered²⁵. On analysis this data bears no resemblance to the size and problem of each sector, particularly when it comes to rail. For example a train driver or rail signal engineer working for a mining company is deemed to be part of the mining industry. However the training and professional development of these skills relates entirely to rail and not to other sectors. Similar examples exist to the employment of rail engineers employed by those building new locomotives who are deemed to be in the manufacturing sector. Also, there is currently no mandatory requirement for registration of engineers on a national basis and thereby difficult to assess extent of skills shortages.

Recommendations:

1. The ARA supports Engineers Australia and other stakeholders in the engineering profession with the view that “a mandatory national registration system for engineering practitioners would minimise risks to public safety, and would facilitate national workforce mobility and skills acquisition. A nationally consistent system of registration of engineering practitioners could be enacted by each State and Territory and should be based on a system of registration established by the profession with the full support of the peak professional engineering bodies and active participation by State and Territory governments”²⁶.
2. A government programme that clearly records the skill base against the relevant industry sector would help in the development of better policy and responses and provide industry with realistic data for effective workforce planning. It would also identify appropriate skills being displaced from other industries which can be redistributed where needed with the development of appropriate bridging qualifications to enable efficient transfer of skills to rail.

Impact of Resource Boom

The impact of the resource boom has added to rail's challenges pertaining to engineering skills shortages with mining companies seeking to employ only experienced engineers. While the rail industry is experiencing significant growth and demand for increased employment it is doing so in a constrained skilled market. "In terms of highly skilled occupations, the mining sector requires relatively large numbers of engineers, mining professionals and accountants, as well as engineering, automotive and electrotechnology trades workers"²⁷.

"In the five years to February 2011, Mining employment rose by 75 100 to 205 800 representing an average annual growth rate of 9.5 per cent"²⁸. Rail's ability to retain skilled professionals is hindered through inability to compete with the higher salaries on offer. "In 2010 median weekly earnings of full-time employees in Mining were higher than for any other industry and nearly double the all industries average"²⁹; which in turn impacts on increase in employment cost across the whole industrial sector. This is quickly leading to higher cost of projects as employers have to pay more for their project engineers, project managers and ancillary technical workforce.

Training and professional development are vital aspects of the solution to tackling skills shortages. The other major impact of the rail sector, in all categories, is the failure of the resource sector to conduct any training. For a number of years there has been reluctance among rail operators to invest in training for fear the qualified employee will be poached before a return on the training investment is realised³⁰. Many employers in the urban passenger networks have increased the numbers of technicians being trained to match the demand from the resource sector with no return on their investment.

Recommendations:

1. Government recognition of the importance and long term benefits that training and development will make towards addressing skills shortages and suggests implementation of a training levy for those organisations who do not contribute to development of engineers. The government could also require the companies associated with the approval of major projects to conduct a percentage of their investment to training of engineers and technicians.
2. To develop a model to enhance professional development, as well as setting minimum requirements for expenditure on training which can be linked to government funding and/or tax incentives, to increase the number of engineering graduates. Similarly, companies who do not meet minimum standards should pay a penalty which would be used toward assistance for the participating organisations.
3. To develop incentives to retain employees e.g. professional development offering vs salary. Suggest government funded exchange program between local companies "to broaden the outlook and experience of rail people and give others a serious insight into rail. This would also tend to compensate for the loss of skill diversity and cross-skilling opportunities that were once a feature of lifetime careers in the large government-owned railways that mostly still existed until the 1990's"³¹.

Future Skills for Engineers and Technicians

Central to understanding the strategies that will provide the largest benefits for the industry, is a comprehensive understanding of the current and future skill and workforce requirements³². The shortage of engineers is complicated by the fact that rail transport is experiencing a technological revolution³³. The use of automotive and digital communications is changing the rail industry. Today rail employs train drivers and rail signal engineers but already the digital control system is changing the need for these skills. Already there are driverless trains and networks controlled remotely through modern control systems.

A signal engineer of today may not have a role in rail in fifteen years. The role undertaken by this engineer will be more likely a control engineer or computer technician. The challenge for industry is undertaking the analysis and research required to investigate and design the course and skill sets needed for the engineer for tomorrow. Reassessing the skills sets could properly identify what tasks must be undertaken by a fully qualified engineer and those that can be carried out by technically-trained engineering staff, which would go some way to ease the burden and provide adequate level of assistance to professional engineers and utilise their time effectively. Just as significant is the need to determine the curriculum being delivered by universities and the high school sector.

It seems obvious that to plan for the next generation, we need to “increase the level of engagement with the school sector”³⁴. The problem of attraction and retention of students in tertiary education as a whole begins in primary and secondary education, with a declining uptake of key mathematics and science prerequisite courses affecting the number of secondary students eligible to apply for tertiary engineering courses, including higher level mathematics, physics and chemistry³⁵. Studies have shown that “though we all are surrounded by the products of engineering in our everyday lives, students and the general public don’t understand what engineers do”³⁶.

Recommendations:

1. The rail industry has not got the resources to undertake the research required to assess the skills required for tomorrow’s workforce. A role for government could be to examine future skills required for engineers and technicians and assist in amending curriculum in current training programs and the education sector.
2. Raise the awareness and profile of the engineering profession and encourage more students to study the enabling subjects through funding of relevant programs which engage students in the real and practical outcomes of engineering work. Eg. F1inSchools Program³⁷

Diversity of Employment

Currently, only 16 percent of the rail workforce is female and companies have been endeavouring to narrow the gender gap through diversity initiatives dedicated to recruiting women, particularly into operational and engineering roles. Gender diversity makes good business sense for a variety of reasons, not least due to the fact that “Women's participation in the labour force in August 2011 is 59%; almost double that of August 1961 (34%)”³⁸. Successfully tapping into this market and attracting more women to engineering in rail is not an easy task but we must continue to focus on this objective.

Government incentives to undertake these programs would expedite greater diversity in the employee base.

Recommendations:

1. Raise the awareness and profile of women in engineering through support of programs such as the RailCorp and University of Wollongong initiative ‘So you think you can Engineer?’ A summit for young women interested in a career in Engineering³⁹.

Conclusion

The Australasian Railway Association appreciates the opportunity to make a submission to this Inquiry on behalf of the Australian Rail Industry and in support of the submission made by the Australian National Engineering Taskforce (ANET).

The Australian rail industry is ready and willing to tackle the challenges of the future and there is a considerable amount of work being undertaken at organisation, industry, skills council and university level to deal with Workforce Development issues.

The industry collaborates on workforce development issues via the Rail Workforce Development Committee (RWDC)⁴⁰, and participates in relevant research conducted by the Cooperative Research Centre (CRC) for Rail Innovation, as well as facilitating initiatives within their own individual organisations.

However, there is still significant work to be done to increase the industry's ability to meet the upcoming challenges especially in the areas of trades and engineering.

These challenges will require time, dedicated resources and funds to develop and implement appropriate strategies.

Appropriate and effective planning can best be achieved through collaboration between relevant rail organisations, external stakeholders and government. This inquiry provides the Senate the potential to guide the re-shaping of the way Australia plans and manages the success of the engineering discipline across a wide range of industries, most importantly the rail sector, which is heavily reliant on engineers to meet the demand of significant state and federal investment in rail.

The ARA fully supports the Inquiry's efforts to improve the current situation around engineering skills shortages. Attracting, developing and engaging a skilled workforce is essential and we welcome the opportunity to provide further information or assistance to the committee as required.

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