White Paper:
Streamlining the Rolling Stock Approval Processes.

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Prepared for:

Rail Industry Safety & Standards Board
Level 6, 200 Creek Street, Spring Hill Qld 4000
PO Box 518, Spring Hill Qld 4004
info@rissb.com.au

Prepared by:

Klaus Clemens
RMAus Pty Ltd
PO Box 1384
ROZELLE 2039

E: klaus.clemens@rmaus.com.au

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A MESSAGE FROM THE AUTHOR

I would like to express my gratitude to all the stakeholders who contributed their time and insights to this project. Their willingness to share experiences and perspectives was invaluable in shaping the content and direction of this White Paper.

The paper aims to stimulate industry debate and provide a roadmap for developing more efficient, consistent, and effective rolling stock approval processes across Australia's rail networks.

In developing the White Paper, I drew upon extensive stakeholder interviews, analysis of current practices, and consideration of emerging industry initiatives. The decision to focus on certification and registration procedures was driven by the recurring themes that emerged during these consultations.

The inclusion of stakeholder concerns, particularly around duplication of efforts and excessive technical requirements, reflects the importance of giving voice to industry participants who deal with these challenges daily. By highlighting both inefficiencies and good practices, I sought to provide a balanced view of the current landscape.

The recommendations presented in this paper are the result of careful consideration of the collected data, industry roles, and potential future developments of the National Rolling Stock Register project. These suggestions are intended to spark further discussion and collaboration to achieve viable solutions.

I encourage readers to view this document as a starting point for ongoing dialogue and improvement in this critical area of rail safety and efficiency.

Klaus Clemens

A MESSAGE FROM THE CEO, RISSB

Industry has told us that the multiplicity of approval processes to operate rolling stock across Australia is a major deterrent to investment and innovation. This is why RISSB has worked tirelessly to initiate and champion the production of this White Paper to address this industry wide issue.

This Paper is the culmination of extensive research to identify emerging industry initiatives, examine the effectiveness of current practices, and comprehensive engagement with key stakeholders around the country.

Together, we hope to examine a path to adoption that is both effective and commercially viable.

Over and above the safety and efficiency management perspective, it can't be said enough that inefficient and uncertain processes create a disincentive for investment into new technologies. Rail freight is essential to Australia's domestic and export economies. This is the substantive business case for improvement in the rolling stock approval processes.

In commending this Paper to industry, I would like to acknowledge the outstanding work done by the RMAus and Klaus Clemens to develop this important piece of work. The involvement of the organisations and individuals who supported the initiative and provided the information in the pages that follow, stands as a message of the rail industry's high expectations and commitment to innovation.

Damien White

CEO RISSB

"Delivering a more efficient and consistent approval process for rolling stock is a critical issue being addressed by the National Rail Action Plan, a significant program of reform set out by all Australian infrastructure and transport ministers.

The NTC has worked closely with industry to identify reform options to reduce the time, cost and resourcing burden on operators and infrastructure managers.

Ministers have now endorsed the options to pilot a single national application approach, develop guidance on safety assurance and harmonise testing requirements and locations.

This is an important initiative that the NTC will continue working with industry to implement and we thank RISSB and its members for their ongoing support."

Michael Hopkins – Chief Executive Officer and Commissioner, NTC

EXECUTIVE SUMMARY

The rail freight industry is seeking streamlined vehicle approval processes to reduce the administrative burden with transparent timeframes that enhances rolling stock utilisation.

Registration and certification of rolling stock ensures both the safety and efficiency of train operations for the freight train operator and the infrastructure manager. It is a regulated safety critical process to ensure and assure the safety of the rail interfaces between the rolling stock and the track infrastructure as well as between other rail operations on the network.

Registering a railway vehicle to operate across the Australian rail networks involves multiple networks managed by different rail infrastructure managers and the freight train operators.

The substantial issue raised by the industry within the broader vehicle approval processes is largely related to the certification of rail vehicles rather than the registration processes.

While the discussion is on registration of Rolling Stock Operators (RSOs) rolling stock on Rail Infrastructure Managers (RIMs) networks, it is not possible to consider registration without certification and to some degree, rail safety accreditation.

The approach is for industry to work collaboratively to deliver the following seven recommendations to address the concerns raised with rolling stock approval processes:

1. The forms and processes be digitised to reduce the duplication of effort. The National Rolling Stock Register (NRSR) project currently being undertaken by RISSB is the best way to deal with this in the short term.
2. Common requirements from the Rail Infrastructure Manager (RIM) can be rationalised and harmonised. They can then be more readily accessed through the NRSR system by the Rolling Stock Operators (RSOs) while allowing acknowledged differences in RIM interface requirements.
3. Reduce the requirements managed by RIMs to the interface performance requirements.
4. In effect, the Design & Construct requirements within the certification processes become self-certification processes for RSOs, consistent with the co-regulation model. This is currently subject to ONRSR scrutiny.
5. Common interface standards for registration are to be incorporated into an Australian Standard to complement AS 7501 for certification.
6. Network specific differences are to be addressed on a safety risk basis that identifies further controls as required by the RIM to demonstrate a So Far As Is Reasonably Practicable (SFAIRP) outcome.
7. Expand the use and the mutual recognition of the Certification and Registration standards to provide impetus for change.

RISSB is well-placed to develop and implement efficiency reforms to rolling stock approval processes, particularly in the context of the co-regulatory framework for safety. It is outside the scope of this paper to consider which federal organisation is best placed to provide regulation and governance over transport efficiency projects.

This paper supports the further development and expansion of the NRSR system and procedures, which will improve standardisation and enhance interoperability across multiple interstate and intrastate networks.


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1. INTRODUCTION

The primary purpose of this White Paper is to inform and stimulate debate in the industry on the rolling stock approval process used by network owners and rolling stock operators. In doing so the paper identifies current Good Practices and opportunities to improve efficiency and safety as well as the barriers and opportunities to achieving these more broadly in the industry.

By way of introduction only, stakeholders views were focus primarily on two issues dealt within the document:

1. The inefficiencies of the application processes for certification and registration with duplication of information by multiple organisations for the "same thing".
2. The apparent inconsistent technical approach to defining minimum operating standards for vehicles and sometimes the excessive detail required for registration.

The discussion is on the registration of RSOs rolling stock on RIMs networks as it is not possible to consider registration without certification and to some degree rail safety accreditation.

Certification and registration of rail vehicles and network approval of trains are safety assurance processes used by RIMs when considering new or modified vehicles and trains.

1.1 Background

Several clarifications need to be made at the outset to clearly make the following distinctions. Registration is not certification, but registration depends upon successful certification as detailed in AS 7501. Registration does not necessarily provide access to a particular route. To provide clarity the following are stated.

- **Certification** - the RIM/RSO joint safety assurance process of verifying and validating the compliance of the design and construction of rolling stock against RIM minimum operating standards and RSO nominated standards.
- **Registration** - the RIM safety process of validating that a RSO vehicle can operate safely on the infrastructure.
- **Rail Vehicles vs. Trains** – A train consists of multiple vehicles. Certification and Registration are for a vehicle but not a train.
- **Network Approval** of a train - the RIM safety process of validating that a RSO train can operate efficiently and safely on the infrastructure and particular routes.
- **Minimum Operating Standards** – the route standard sets the efficient and safe, technical and operating interface standards for the train path. E.g. track gauge, axle load, power and braking requirements etc.3

1.2 Types of Rail Vehicles

Registration and certification are applied to all rail vehicles that operate steel wheels on steel railway tracks including:

- Hand trolleys
- Road Rail Vehicles
- Track Machines
- Wagons and carriages
- Locomotives
- DMU – diesel passenger trains
- EMU – electric passenger trains

Certification is carried out at the rail vehicle level by class or 'Type' of vehicle and in some rarer cases by individual vehicle, whereas network approval is more usually for a train and may be route specific.

The efficiency and safety hazards a hand trolley introduces to a network are much less in number and consequence than a locomotive. Yet essentially the process and the artifacts are the same but scaled to the complexity of the engineering and operating assurances required for the two processes.

All these vehicle types are found to operate on more than one RIM Network and need multiple certifications and registrations.

1.3 Co-regulation

Co-regulation was first introduced in an Australian railway in 1993[1] to enhance the efficiency and safety of the rail transport system.

The co-regulation approach involves a shared responsibility between the government and the industry. It provides for a collaborative approach to managing safety, operational standards, and infrastructure development.

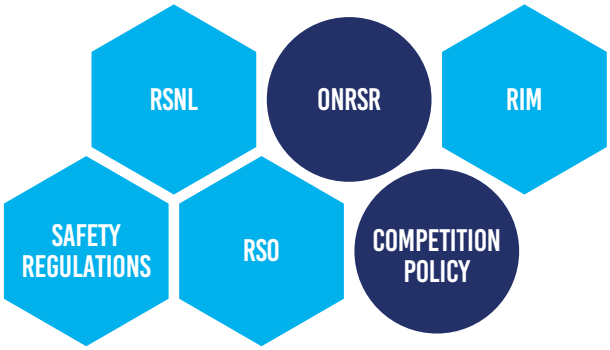
It does this by having the industry demonstrate how to manage a safe railway. Once the Safety Management System (SMS) is accepted and the organisation accredited the SMS in effect becomes a regulation under the law.

The government sets the legislative framework and overall safety objectives, while the railway operators are responsible for achieving these objectives through their safety management systems. This approach encourages innovation and efficiency within the industry, as operators have the flexibility to determine the most effective ways to achieve safety outcomes. At the same time, the government retains oversight to ensure public safety and accountability.

1 *NSW Rail Safety Act 1993*

Co-regulation thus attempts to strike a balance between government oversight and industry autonomy, aiming to promote both safety and efficiency in the rail transport system.

Figure 1: *ONRSR oversees the industry safety, the structure comes from competition policy.*



The vertical separation of railways in Australia commenced in 1996[2], primarily due to the adoption of the 'National Competition Policy Agreement 1995', which aimed to implement recommendations from the Hilmer report on microeconomic reform.

That competition policy mandated that public monopolies be stripped of regulatory functions before being exposed to competition and established a regime for third-party access to significant government-owned infrastructure facilities. The changes were intended to improve the efficiency, safety, and profitability of the railway industry but did not achieve the expected outcomes as noted in the 2005 final report of the Special Commission of Inquiry (SCOI) into the Waterfall Rail Accident.

The national approach to rail safety commenced with the introduction of the Rail Safety National Law (RSNL) in 2012. It emphasizes the promotion of safety and the provision of a national scheme for rail safety. The Office of the National Rail Safety Regulator (ONRSR) as the regulator was established to enforce and promote safe railway operations.

ONRSR has responsibility for regulatory oversight of rail safety in every Australian state and territory, to promote and improve national rail safety and ensure the safety of the community. In addition, it works to bring about legislative uniformity to reduce the costs, administrative burden and any uncertainty that operators face working across state and territory borders.

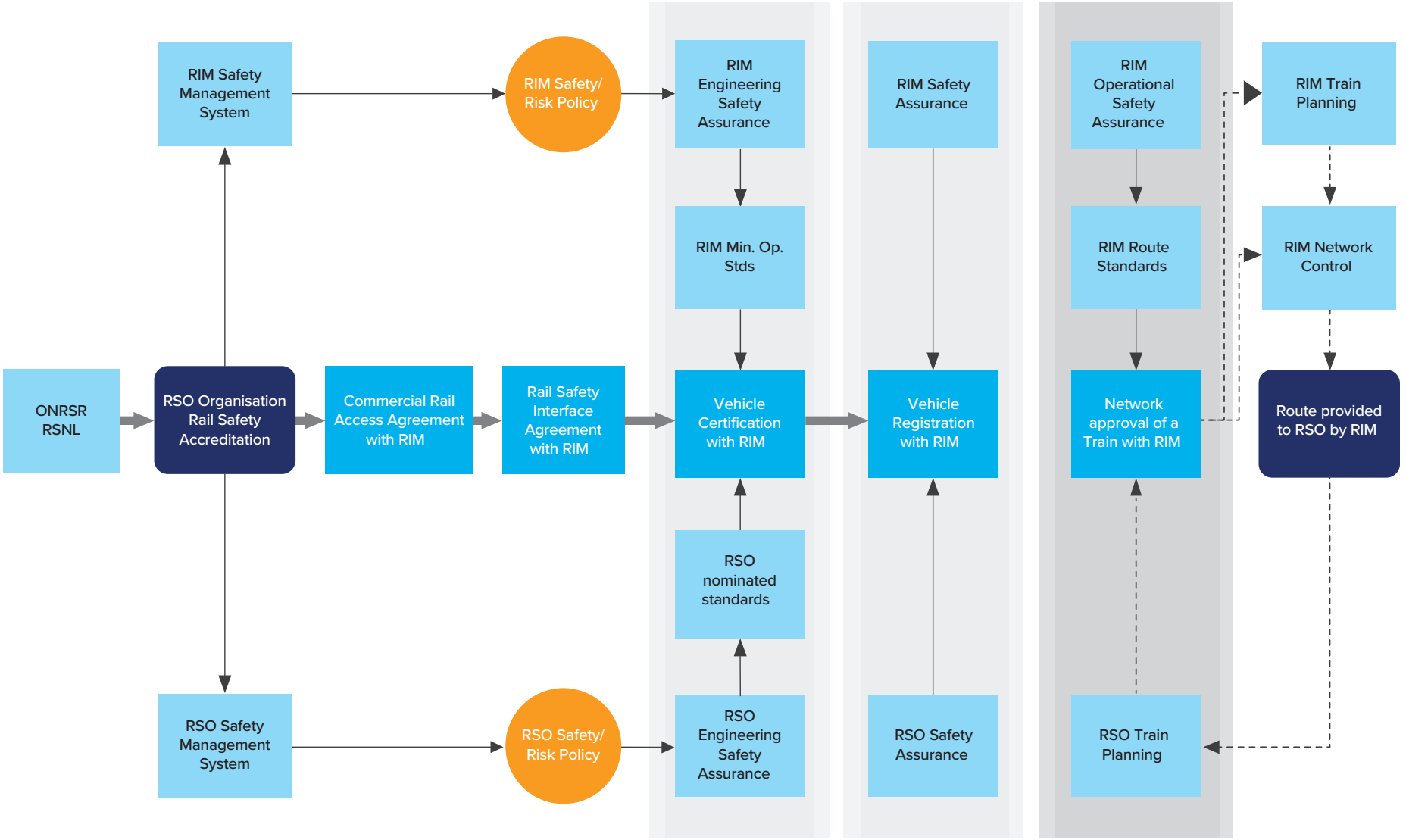
An entity that has demonstrated its competency and capacity to operate a railway safely receives approval of its rail SMS. The accredited SMS documents the policies, processes, standards and plans required to run a railway So Far As Is Reasonably Practical (SFAIRP).

Under the RSNL the SMS is in effect a regulation. ONRSR prosecutes not just for breach of its own regulations but also for failing to undertake those actions that the organisation itself has certified as required to operate the railway in the SMS.

Certification, Registration and Network Approval (of a train consist) processes form a part of the accredited SMS of a railway and as such are in effect a regulation under the RSNL.

2 *NSW Transport Administration Amendment (Rail Corporatisation and Restructuring) Act 1996*

Figure 2: *The SMS, and Safety and Risk policies impact upon the Rolling Stock Approval Process.*



HIGHLIGHTS

The safety of railways in a co-regulatory environment relies on the careful definition and management of the technical and operational interfaces. Understanding the roles and responsibilities of the various parties involved in this process is crucial to understanding the challenges associated with the rolling stock approval processes.

2. KEY STAKEHOLDERS AND ROLES

ONRSR accredits the RIM and RSO safety management systems which includes the processes of certification and registration as well as the Rail Safety Interface Agreement (RSIA). The RIM and RSO through the accreditation are authorised (in effect a licence to operate) to undertake their roles within the scope of the approved SMS. For material changes they must seek ONRSR's approval.

RISSB produces the standards for the vehicles and the certification and develops the NRSR register.

The independent competent person (ICP), if used, is a recognised, qualified and competent person that certifies the vehicle and advises on operating standards that apply.

The owner of the vehicle identifies themselves in the process but generally do not directly engage in the registration process with exceptions.

Key documents and approvals required for a RSO to obtain a route from a RIM are:

1. Rail safety accreditation approval as a RSO by ONRSR.
2. Access agreement to operate as an RSO on a RIM network.
3. Rail Safety Interface Agreement (RSIA) between the RSO and RIM.
4. Certifications (or acceptance of certifications) of the vehicle design and construction (etc.) by the RIM.
5. Registration of the vehicle in the RIM operating system.
6. An approved train configuration (consist) on the RIM network.

Table 1: *Industry roles and where they interact in achieving a route for a train.*

Role	Rail Safety Accreditation of SMS	Access Agreement	Rail Safety Interface Agreement	Certification / registration of vehicle	Approval of train
RSO	✓	✓	✓	✓	✓
RIM	✓	✓	✓	✓	✓
ICP[3]	✗	✗	✗	✓	✓
Owner	✗	✗	✗	✓	✗
ONRSR	✓	✗	✓	✗	✗

Safety in the railways relies on the careful definition and management of the technical and operational interfaces. More than most other transport modes the engineering and operational safety assurance is tightly coupled to the performance of each of the interfaces. At the highest level those interfaces occur between three areas of a railway. 1. Operating systems and procedures, 2. Track infrastructure, and 3. Rolling stock. Rail Safety Interface Agreements (RSIAs) between the parties is mandatory through the RSNL Regulation. In the RSIA the interface hazards are identified with the mitigations and controls as well as which of the parties is accountable for those mitigations and controls.

Table 2: *Rail safety interface hazard lead role.*

Role	Operating Systems & Procedures	Track Infrastructure	Rollingstock
Rolling Stock Operator	Lead on train management	-	Lead
Rail Infrastructure Manager	Lead on Network Rules & technical interfaces	Lead	-

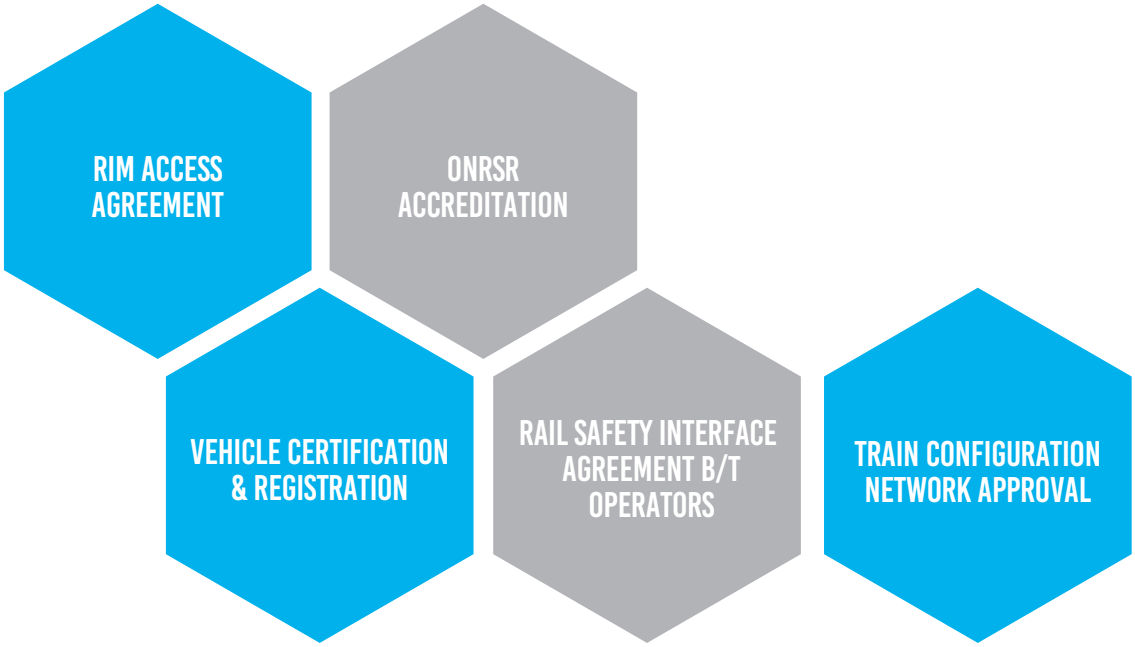
3 *Accepted as certifying authority by some RIMs*

ONRSR accepts (accredits) the SMS of the RIM and RSO as the processes they are obliged to follow to achieve a safe outcome. It is the only regulated interface between the RIM and RSO with respect to the final effect on the certification standards and registration processes both of which are risk-based processes covered by ONRSR's guidelines regarding engineering and operational safety assurance processes. The final operational approval step before being allocated a train path is a review of the train configuration to ensure the train is not too long, too heavy, has sufficient power etc. are essentially efficiency checks confirming the train can maintain its train path schedule.

The regulator does not manage the interfaces but reviews and accepts the processes that manage them in both organisations. The quality and efficiency of the outcome is largely with the RIM and RSO to determine.

The differences in approaches by the RIMs appeared to be more related to their organisational capacities to manage the interfaces. Railways that historically were relatively isolated with little relative diversity in infrastructure standards and little practical differences with rolling stock had no need to develop and manage the standards to the same high degree.

Figure 3: *Approvals and agreements required to gain a train route.*



Stakeholder Issues

Key stakeholders to the rolling stock approval processes have been identified as:

- Rolling Stock Operator (RSO): operator of the train.
- Rail Infrastructure Manager (RIM): access provider and traffic manager.
- Owner: of the individual vehicles.
- Office National Rail Safety Regulator (ONRSR): the independent rail safety regulator.
- RISSB, the standards organisation for the Australian Railway Industry: sets out the process for the certification of rolling stock.

The RIM and RSO key stakeholders interviewed in preparing the paper are detailed in Appendix B. Hyperlinks to the documents available from the stakeholders are provided in Appendix C. A detailed issues and comments register is provided in Appendix D.

There were five common themes on the discussion points raised by stakeholders:

1. Registration being a cumbersome time-consuming paper-based approach with inconsistent data definitions and data fields.
2. Certification process being a much larger burden and concern than Registration.
3. There were examples of 'Good Practice' mutual recognition of other RIM's acceptance of certifications and registrations.
4. All were prepared to share their own data to test the NRSR register.
5. Questions regarding the NRSR register which centered around functions and concerns over the governance of the data and the functionality.

Stakeholders may not be receiving the RISSB NRSR register project communications. The stakeholders themselves acknowledged that they had not paid enough attention to the project. There was concern for the long-term plan for the project. Most expressed the view that the business case for its implementation was strong for them.

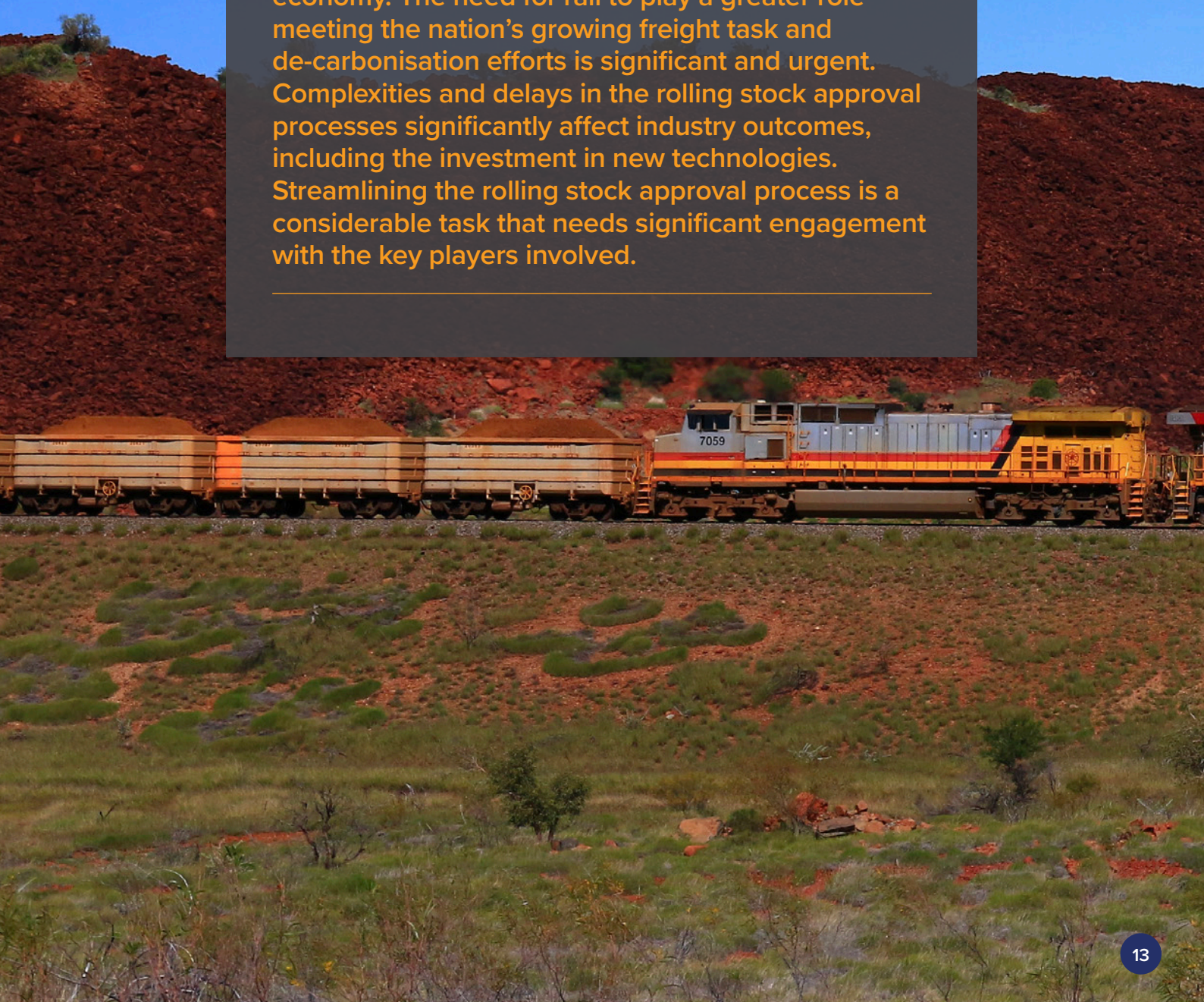
RIM registration processes were confirmed as not being digitised and were a series of complex forms with small differences, but the overall process was the same. RSOs were concerned that while registration is the appraisal of vehicles and the interface to operating standards, they were being asked a great deal of information that was beyond that scope.

For the RSOs the certification processes and documentation are a bigger issue than registration. The RIMs vehicle certification processes were cumbersome with time consuming processes. While there is some recognition of other RIM certifications there were also reports of RIMs that did not accept anyone else's test results thus requiring expensive retesting.

Several cases of RIMS mutually recognising the certification and registration information were given as examples of "Good Practice". It was however not clear that this was the best safety outcome or due to under resourced engineering assurance functions.

HIGHLIGHTS

Rail freight is the backbone of the Australian economy. The need for rail to play a greater role meeting the nation's growing freight task and de-carbonisation efforts is significant and urgent. Complexities and delays in the rolling stock approval processes significantly affect industry outcomes, including the investment in new technologies. Streamlining the rolling stock approval process is a considerable task that needs significant engagement with the key players involved.



3. SIZE OF THE TASK

Rail freight is essential to Australia's domestic and export economies. There was 445.3[4] billion tonne kilometres of rail freight moved in 2022 to 2023. Passenger[5] journeys on heavy rail in Australian capital cites was 328 million passenger movements in 2022 compared with 754 million passenger movements pre-Covid.

Rail vehicles are expensive assets. If registration is delayed the vehicle cannot be allocated a train path. This reduces asset utilisation and opportunity cost for the RSO. This is the substantive business case for improvement in the approvals processes.

In practice every operator (RSO) must have at least one vehicle registered on at least one rail network (RIM) even if they are the same organisation, putting aside those RSOs that are purely labour hire organisations.

There are no ready metrics to measure the registration task. ONRSR publishes a table of the 198 accredited organisations and identifies these as RIM, RSO or both, and which States and Territories they are accredited in. There are 143 accredited RIMs and 182 RSOs, 127 are both a RIM and RSO.

Each State & Territory has several RIM networks some of which are quite extensive while others have little significance to RSOs.

The six largest interstate rail freight companies all operate across the ARTC network and require registration of their fleets of thousands of vehicles with at least another five RIMs to reach ocean Ports, inter-modal and bulk transport hubs.

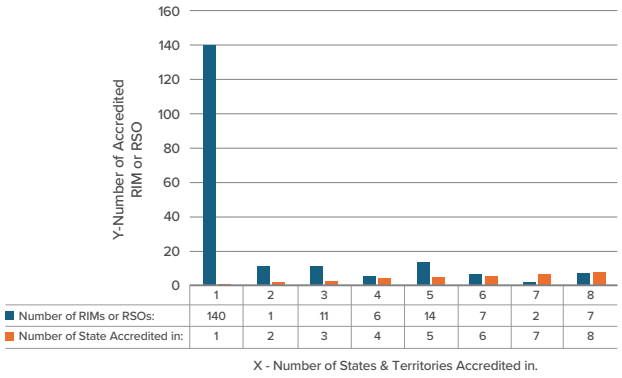
For example, from the ARTC route standards, their main network interfaces directly with the following networks:

- Queensland Rail (To the North of Acacia Ridge QLD)
- Sydney Trains (Suburban train network NSW)
- NSW Trains (Transport for NSW)
- Aurizon (Tarcoola to Darwin NT)
- ARC Infrastructure (To the West of Parkeston WA)
- VLine (Multiple interface points in Victoria)

In practice to register a new freight wagon there are typically up to 9 different application forms to complete.

From the ONRSR information, the distribution of the States & Territories that each accredited party is operating is illustrated in the following figure. This is informative but leaves many questions unanswered.

Figure 4: *The number of entities by the number of States & Territories they are accredited in.*



Seven companies are accredited in every State & Territory. They are all track maintenance and construction contractors. They are predominantly operating track maintenance vehicles that are registered with each network they work on or traverse to get to the worksite.

Hand trolleys, road rail vehicles and track machines are moved on to various RIM networks in the country. Many of these vehicles are hired out by rental equipment companies. In addition, some of the major contractors have their own equipment and deploy these on their various projects across networks.

The number of maintenance vehicles is difficult to determine but in NSW on just the TfNSW network there are within the Train Operating Conditions (TOC) Manual, 17 pages of track machines listed and 46 pages of road rail vehicles. It is not a trivial amount to manage.

Table 3: *The number of accredited RIMs and RSOs by State and Territory.*

State or Territory	Number of RIMS	% of total number RIMs	Number of RSO	% of total number RSOs
NSW	57	23.6	85	22.8
QLD	46	19.0	67	18.0
VIC	43	17.8	65	17.4
WA	34	14.0	53	14.2
SA	33	13.6	50	13.4
TAS	12	5.0	18	4.8
NT	9	3.7	17	4.6
ACT	8	3.3	18	4.8

4 https://datahub.freightaustralia.gov.au/explore/rail
5 https://www.bitre.gov.au/publications/2023/australian-infrastructure-and-transport-statistics-yearbook-2023/rail

HIGHLIGHTS

It's important that all rolling stock operating on the rail network meet the technical requirements to be compatible with the network infrastructure. Understanding the various standards at play within the rolling stock approval process and the risks that it is intended to mitigate is essential to understanding the challenges associated with the rolling stock approval processes.

4. TECHNICAL STANDARDS

Certification - Minimum Operating Standards

The purpose of the RIM 'Minimum Operating Standards' also known as 'Interface Requirements' for rolling stock is to ensure that all rolling stock operating on the RIM network meet the minimum technical requirements to be compatible with the network infrastructure. These standards are the primary documents that a new or modified vehicle is certified against for a particular network.

Design requirements provide for the specification of performance parameters to be met by rolling stock for each section of track over which they operate. This may include as follows:

a. Vehicle structure.
b. Vehicle suspension.
c. Coupling and draw gear.
d. Electrical couplings and equipment.
e. Braking systems.
f. Motive power systems.
g. Wheel sets.
h. Operation of rolling stock, safety elements.
i. Rolling stock recovery equipment.

Construction requirements provide for rolling stock in respect of the items listed above. They also include the following items:

a. Process control.
b. Use of appropriate construction and installation practices and specifications.
c. Procedures to ensure use of approved and current plans.
d. Preparation of operating and maintenance procedures and instructions.

Commissioning requirements for the inspection and testing of new or modified rolling stock ensure that vehicles are verified as meeting the appropriate requirements and standards.

Inspection and test plans cover at least the following items:

a. The compatibility between new or modified rolling stock and other functional areas.
b. Verification that the system conforms to the design and operating requirements of the RSO and the operating parameters of the railway.
c. Validation that the installed system conforms to the required safety standards and RSO requirements.

Commissioning performance tests for rolling stock include the following:

a. Structural integrity.
b. Ride performance.
c. Noise and vibration emissions.
d. Braking performance for air brake, parking brake and handbrake.
e. Electrical equipment.
f. Ventilation.
g. Tractive performance.
h. Signalling and telecommunications system compatibility.
i. Conformance to permissible rolling stock outline.

Operating (Route) Standards

'Operating (Route) Standards' are established requirements. They are applied to a common and repeated use of rules, conditions, guidelines, or characteristics for rail operations or related processes.

Operating (Route) Standards are used by train planning, network control, and train crew, and are read in conjunction with the relevant safeworking procedures as well as the train plan.

Route standards, operating procedures and the register of vehicles may be provided by the RIM.

Some or all of the above information are generally included in the document known by several names in the industry including:

- 'Train Operating Conditions' (TOC Manual TfNSW)
- 'Train Operating Data' (VLine)
- 'Load Tables' (Aurizon)
- 'Route Access Standards' (ARTC)

These documents detail the technical requirements for train operations for the purpose of safe and efficient operations and is applicable to all freight, passenger, and infrastructure maintenance operations.

Contents of the operating standards may include:

- **Route Standards:**
  - Classification of lines and locations of tunnels and field devices
  - Safeworking systems
  - Grades
  - Areas controlled by network control boards
  - Track width classifications
  - Train operating maximum length
- **Operating procedures:**
  - Locomotive operations
  - Train operations
  - Train marshalling
  - Loading restrictions
  - Train inspection
  - Disabled trains and defective vehicles
  - Operation of infrastructure maintenance vehicles
- **Register of vehicles:**
  - Locomotive and rolling stock data
  - On-track infrastructure maintenance vehicle data
  - Road Rail Vehicle (RRV) data

HIGHLIGHTS

Registering a railway vehicle to operate across the Australian rail networks involves multiple networks, which are managed by different infrastructure managers. This section aims to clearly outline the various requirements associated with the rolling stock approval process.

5. ROLLING STOCK APPROVAL PROCESS REQUIREMENTS

At the highest level the process to achieve rolling stock approvals follows on from agreements, approvals and acceptances on each RIMs network.

Certification precedes registration. Certification of each class (or type) of vehicle is design and construction assurance to nominated standards that may include Australian Standards but also International Standards. Certification documentation may be used to demonstrate how risks related to rolling stock are being managed by the RSO and RIM under the accreditation requirements of ONRSR.

Unlike certification, registration is about meeting the interface requirements and populating an operating procedure used to run the railways safely and efficiently. A vehicle, or vehicle type, must appear on the approved register, usually within a route operating standard, for the train to be given a train path by the RIM. As an exception, some operators may provide a waiver system.

5.1 Rolling stock compliance certification

AS 7501:2019 Rolling stock compliance certification, is a generic process standard for assessing rolling stock compliance with the referenced standards that has as its objectives:

1. A standard method for certifying rolling stock compliance to referenced standards.
2. Facilitating network registration of rolling stock.

Operation of rolling stock regarding network safe working rules and route standards is not covered by AS 7501. That is the standard does not address the network approval of trains process used by RIMs.

The standard covers the design, construction and testing of rolling stock. Certification of individual units of rolling stock or those which are coupled to operate is included, but not trains.

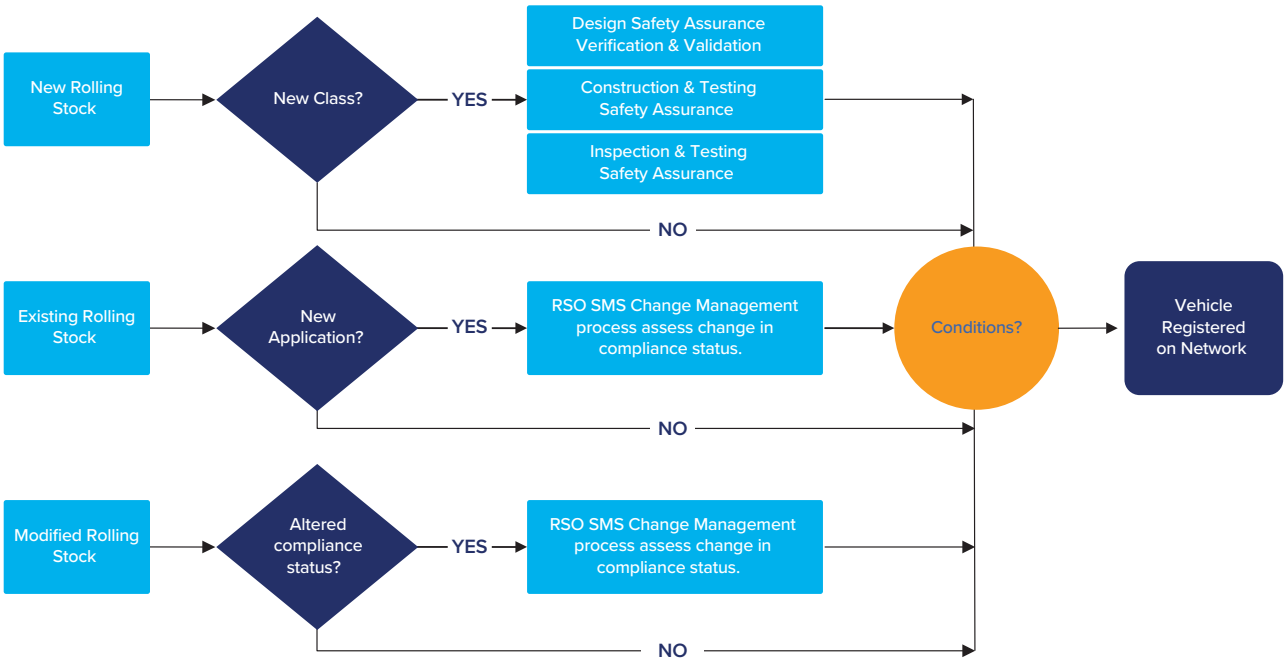
AS 7501 applies to new rolling stock, modified rolling stock and existing rolling stock being proposed for operation on a Network on which the class of rolling stock has not previously operated. It also applies to existing rolling stock that is to be or has been modified and has previously operated on the network.

The standard incorporates both mandatory requirements and non-mandatory preferred recommendations. Where a recommended control is not applied it may be incumbent on the adopter of the standard to demonstrate their actual method of controlling the risk. Similarly, it could also be incumbent on an adopter of the standard to demonstrate their method of controlling the risk to contracting entities, or interfacing organisations where the risk may be shared.

Certification documentation produced by the process includes:

1. Design compliance certificate.
2. Construction conformance certificate.
3. Acceptance for on-track testing certificate.
4. Certificate of Standards compliance.

Figure 5: *AS 7501 as applied to certification of vehicles.*



ONRSR is highlighting[8] the need for Independent Competent Persons (ICPs) that certify rolling stock (including road rail vehicles) to be truly independent and to stress the requirement for rail transport operators to undertake appropriate due diligence in their selection and acceptance of an ICP.

The Australian Standard AS 7503 Train Identification and Integrity describes requirements for the identification of rolling stock.

AS 7503 specifies:

1. That each rolling stock shall have a specific vehicle identifier
2. Requirements for display of the identifier
3. The fitment of a manufacturer's nameplate on each new vehicle
4. Requirements for Automatic Equipment Identification (AEI) vehicle identification tags
5. Requirements for identification of equipment

The general purpose of AS 7503 is to maintain consistency in the identification of rolling stock, including the location and programming of AEI tags on Australian rail networks. Rolling stock shall be fitted with AEI tags where required by the network they are running on as specified in the Standard. The standard includes other requirements on tag size and location etc. for consistency of access and visibility.

In practical terms the certification processes implemented by the RIMs and the standards being applied are common, but not the same as AS 7501 process. This was acknowledged by some RIMs and RSOs interviewed. Four of the RIMs provide a reference to AS 7501 in their certification procedures. The comparison of data requirements made in Section 6 of this report supports the view that most RIMs are unlikely to be completing a comprehensive AS 7501 approach.

Many differences were observed related to the roles involved for e.g. who could certify, what was required to be in scope to achieve certification.

Essentially the RIMs were observed to be at two ends of the approach to certification etc.:

1. Function like a regulator being very specific about requirements with a due diligence approach to the process.
2. Treat hazards associated with certification as an RSO responsibility with minimal scrutiny and accept adjoining RIM processes and approvals.

Interviewing only a sample of the specific RIM certification managers the author's observation was that the approach by RIMs with a large complex RSOs interface was to manage the RSO hazards rather than restrict themselves to their own hazards. This is a complex relationship whose structure is usually articulated in the Rail Safety Interface Agreement.

RSO stakeholders' comments were "they behave like the regulator" and another "why are they interested in my RSO risks. I'm managing those not them". At least one RIM certification manager acknowledged "we are like a regulator" and a related comment from an RSO "why do they care how I will recover a train, that's my concern". Clarification of role responsibilities, objectives and a review of certification requirements may be beneficial to the industry. ONSRS's expectations should be central to any discussion to increase coordination and cooperation.

The RIMs with the smaller interface with "outside RSOs" were reported to have fewer resources to manage certification and were far less concerned with the process requirements and more readily recognising other RIM certifications albeit informally.

5.2 Registration with a RIM

The requirements for registration differ depending upon the type of vehicle or train. This is because they have different interfaces with the operating standards.

In practice the freight operator manages not only the differences in the documented processes, if they exist, but also the actual requirements for registration.

The least of these is a simple trolley which still requires registration, through to track machines that can be large, complicated pieces of machinery. These appear to attract a lot less concern to the RIMs and to the track infrastructure maintenance and construction companies (RSOs) operating them. However, based on a review of the TfNSW and ARTC vehicle registers they are considerable in number.

a. **Trolleys and trailers** are small vehicles used for conveying tools and equipment along the track. A trailer is like a trolley but fitted with a tow bar for connecting to another vehicle.
b. **Road-rail vehicles** are rubber tyred or crawler tracked road vehicle fitted with retractable rail wheels.
c. **Track maintenance vehicles:** include tampers, ballast regulators, overhead wiring vehicles, rail grinders, tracklayers, ballast cleaners, etc.

Trains and in particular locomotive hauled freight trains have considerably more interface with the RIM infrastructure and operating standards compared to non-train vehicles.

d. **Locomotive:** a self-propelled rail-bound vehicle that may be used to move other vehicles.

e. **Wagons & Carriages:** a rail vehicle hauled by a locomotive capable of carrying freight or passengers.

f. **Diesel Multiple Unit (DMU):** a distributed powered passenger train made up of similar diesel powered and non-powered vehicles capable of carrying passengers and operating as a train.

g. **Electric Multiple Unit (EMU):** a distributed power electric passenger train made up of similar powered and non-powered vehicles capable of carrying passengers and operating as a train.

A second dimension to the RIM process for registration is how well the operational and technical interfaces are defined and then by the degree that the RSO rolling stock interacts with them. Taking the examples of a trolley compared to a freight train. The trolley does not have to interact with the signalling system but the freight train must operate reliably and safely all the signal systems it interacts with. Locomotives operating as light engines (not hauling wagons) may not operate signalling reliably but that does not mean they can not operate on the route. There are conditions placed on the registration that dictate how that vehicle must be operated by network control and the train crew by the method of block working deemed to be the safest method within the technical constraints. On routes with high demand or priority traffic the RIMs network control may make the business decision to not permit a train to operate with such an inefficient procedure at that time in the train schedule.

5.3 Network Approval of Train

Another dimension to the difference in approaches of the RIM to registration is that they have business objectives for efficiency, utilisation of the corridor, reliability and safety. An example of this is that some RSO operators may gain a reputation for not operating reliable equipment or not entering the train path on time. Such an RSO may have condition placed upon their registration to have more locomotives than they need for the task to make them less of an efficiency risk.

Operating standards specify the specific conditions for the operation of a train and rolling stock on a network and a route. Topics covered may include:

- Route Standards
- Locomotive Operations
- Train Operations
- Train Marshalling
- Loading Restrictions
- Train Inspection
- Train Numbering
- Disabled Trains & Defective Trains
- Operation of Infrastructure Maintenance Vehicles
- Rolling stock vehicle data
- Road Rail Vehicle data

Registration in the operating system of the RIM may contain conditions on the operating parameters or configuration of the train. Typical examples are the length of the train, it's maximum axle load, it's maximum speed etc. It also includes, the requirements for driver safety systems, train radio, lighting etc.

Other risk factors associated with route standards and the signalling system as noted by ARTC document ESS-32-01 may include:

- ineffective detection of train presence
- electromagnetic interference between trains and signalling infrastructure
- electrical interference between trains and signalling infrastructure
- train braking performance and acceleration
- damage to signalling equipment such as facing points and axle counters, due to mismatched wheel geometry.
- Information transfer between signalling systems and train or driver
- the ability of the driver to initiate appropriate responsive action

A waiver is required for the operation of any vehicle/vehicle type which is authorised, but not registered. Not all RIMs provide waivers for unregistered vehicles.

HIGHLIGHTS

Rolling stock data exchange is core to the conversation and is considered critical to managing operational risks. Having a mechanism to clearly define the data requirements, efficiently exchange that data, and make it available for the industry is essential for improving the rolling stock approval process. This section of the paper outlines the observations that support standardising a rationalised list of data fields.

6. DATA REQUIREMENTS

I note that ARTC have outsourced the track machine and road rail vehicle asset management and register to Aquipa the developers of the RISSB NRSR data base. The outcome of this beneficial arrangement is that it provides a ready way for the industry to view the availability of and book the hire of track machines and road rail vehicles. This by far exceeds the purpose and functions of the NRSR project which is a list of registered vehicles and their registered data.

Freight operators did raise concerns that their fleet deployments can be more readily determined by competitors who can then bid for work that they are less well placed to operate. The NRSR register project advises that data availability is controlled by the RSO and not the RIM, and the register does not capture deployment information unlike the ARTC Aquipa system.

Differences in data definitions and the number of data fields were raised as an issue between the different RIM processes for the RSOs. I am advised the NRSR register accommodates differences in data definitions.

Appendix E contains a comparison of subject headings required for three different types of vehicles. This plus the long list of track vehicles and road rail vehicles in the registers of NSW and ARTC suggest this may a good starting point for the NRSR register.

The NRSR register based on AS 7501 can accommodate 221 data fields. For comparison, removing the seven passenger requirements leaves 214 data elements describing a freight train. I note that a stakeholder commented that this was “too much”. But I also note that each RIM nominates and can add data fields as they need in the NRSR register and the data in AS 7501 is for information only.

Several stakeholders, in particular one RSO, provided details of their data field requirements for RIM registration. This has been consolidated into a spreadsheet for a freight train to allow comparison between the RIMs data requirements.

Table 4 summarises the number of common data fields across the number of RIMs. The number of common fields across 9 RIMs is minimal. However 60% of the data fields across the top 3 RIMs are aligned. It does not serve the purpose of the report on the details of those data fields or their RIM identities.

Table 4: *Number of RIMs that nominated the same data fields.*

Number of RIMS nominated	Number of Common Data fields	CUM No. Data Fields	% of Total	CUM %
9	5	5	2.4	2.4
8	5	10	2.4	4.8
7	10	20	4.8	9.6
6	18	38	8.6	18.2
5	11	49	5.3	23.4
4	26	75	12.4	35.9
3	49	124	23.4	59.3
2	24	148	11.5	70.8
1	61	209	29.2	100.0

The common data fields nominated from 9 - 4 of RIMs listed in Table 4 are representative of ownership, operator details and the physical and performance characteristics of the train. The common data nominated from up to <3 of the RIMs can be characterised as more detailed testing and compliance related data but also included some but far fewer physical and performance characteristics of the train.

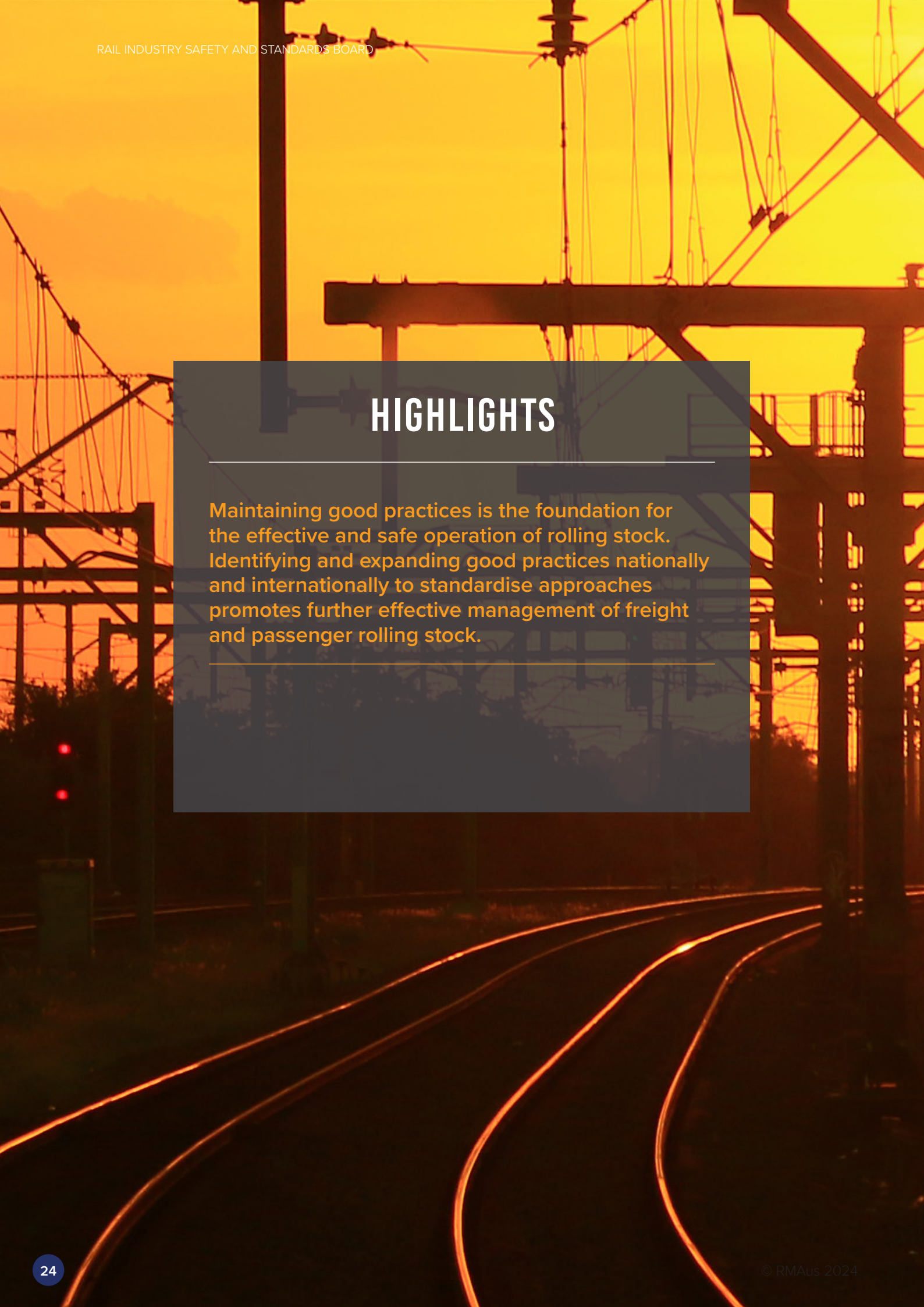
The data in Table 4 may be seen to validate the industry view that the data fields nominated by some RIMs could be rationalised. But it also strongly suggests other RIMs are not capturing all the data fields needed. Neither conclusion can be made because these are outputs of risk processes not a popularity vote. However, both observations supports standardising a rationalised list of data fields.

The data fields included in each RIMs process forms part of the risk and engineering assurance processes that have been accepted by ONRSR. The data requirements in theory at least depend on what interfaces and incidents have been considered in preparing the route standards. They are an output of the SMS procedures and processes as well as the organisational consequences of the individual RIMs.

Comparing freight train certification/registration data field requirements across seven RIMs the range was from 24 to 172. TfNSW needed the most data at 172 elements which is not unexpected to the informed reader.

Reasons for the large variation in technical data requirements:

1. Several of the RIMs on the lower end of the range said, “that if it’s been accepted on the adjoining network to get here, we take it that its OK”.
2. A clear difference in the risk (appetite) policy being applied.
3. The more heavily trafficked the RIM the more data registration requirements they have.
4. The larger and the more complex the RIM network the more data registration requirements they have.
5. The SMS processes and the RIMs competency and capacity varies.
6. There is no current forum or avenue for RIMs to consider their collective approach.



HIGHLIGHTS

Maintaining good practices is the foundation for the effective and safe operation of rolling stock. Identifying and expanding good practices nationally and internationally to standardise approaches promotes further effective management of freight and passenger rolling stock.

7. GOOD PRACTICE

A 'Good Practice' is a practice that has been proven to work well and produce good results and is therefore recommended as a model. It is a successful experience that has been tested and validated and deserves to be shared so that more people can adopt it. A good practice should be effective, successful, and sustainable.

The benefits of identifying and sharing good practice include replacing poor practices, raising the performance of poor performers, decreasing the learning curve, reducing rework, preventing "reinventing the wheel," and cutting costs through better productivity and efficiency.

In reviewing the RIM registration processes the following are considered good practice:

i. RSSB (UK) Safety Interface Committee Protocol[7] sets out a framework for the governance, operation, and management of the efficiency at the interface between vehicles and infrastructure.

ii. ARTC – online Track Maintenance Vehicle Register (Aquipa) serves as a centralised platform for registering and managing rail track maintenance vehicles. Key points are:

   a. Ensures compliance and safety.

   b. TOC Waivers are no longer required.

   c. Streamlines the process and provides a more efficient and safer solution.

iii. Railways of Australia (ROA) was an Australian association of railways operators established in 1963 when the government railway operators of Australia and New Zealand decided to unite to promote the industry on a national scale. The ROA national railways interface standards for rolling stock and infrastructure are considered the parent documents of all railway standards since the late 1980's having been developed from the Commissioner of Railways meetings of the Chief Operators and Chief Engineers meetings. ROA standards represented the best practice standards of their time and are the basis for some of the existing Certification standards used today.

iv. Similarly, TfNSW certification/registration standards and procedures represent a body of knowledge from which a rationalised standard for a vertically separated railway based upon individual assessment of the network hazards applying their own risk acceptance policy.

v. RISSB's Australian Rail Risk Model[8] (ARRM) provides a basis for a common view of the hazards when considering the efficient rationalised and standardised 'Minimum Operating Standards' for rollingstock interfaces.

7 https://www.rssb.co.uk/about-rssb/groups-and-committees/technical-strategy/system-interface-committee-chairs
8 https://www.rissb.com.au/safety-tools/arrm

HIGHLIGHTS

RISSB in partnership with Commonwealth, state and territory governments, has developed a national rolling stock register that will provide a single data source on rolling stock across Australia. The national rolling stock registration system is a significant tool that can assist in resolving the identified challenges with rolling stock approval processes.

8. NRSR REGISTER PROJECT

The NRSR register is a system being developed by RISSB in partnership with Commonwealth, State and Territory governments. It will provide a single data source on rolling stock across Australia and a central platform for managing the rolling stock registration process.

The NRSR enables the input of rolling stock identification information and provides rail infrastructure managers, rolling stock operators and asset owners the functionality to update and access shared data within agreed data security parameters. In 2020-21, with the support of state transport ministers, RISSB in partnership with the NTC, as a project of the National Rail Action Plan (NRAP), was tasked to deliver a register of vehicle registration numbers. RISSB has self-funded further development and ongoing support to enable it to become operational.

The NRSR system provides a centralised environment for rolling stock owners, operators (RSO) and infrastructure managers (RIM) to exchange information for the purposes of registering rolling stock.

The RSOs can submit the information at a single point and select the networks to which the registration is applicable. The system notifies the corresponding RIMs of a pending application, and the RIMs can authorise the application on the system and highlight any exemptions.

Rolling stock owners and operators use the system to share information, and RIMs use the system to clearly define the registration requirement creating consistency and the level of transparency required.

The system is currently in testing phase with RIMs providing their own RSO information. RISSB summarises the benefits of the NRSR system as:

1. Centralised rolling stock data repository.
2. Rolling stock information is submitted once for registration on any network.
3. A unique identifier is assigned to all rolling stock.
4. The history of rolling stock is centrally captured, including data associated with significant modifications such as gauge conversation.
5. Removes the need for re-registration of any rolling stock on asset transfer.
6. Transparency on the registration requirements across the network and ongoing harmonisation of the requirements.
7. Cost saving to RSOs & RIMs as they do not have to maintain their own registration systems.
8. Up-to-date data is available for other systems, such as Wayside detection and other operations systems.
9. Improvement in safety and efficiency for assurance processes (management of risk, training, auditing)
10. Provides a digital foundation for the further rationalisation and harmonisation of RIM requirements.

I make the following further observations regarding the NRSR project:

1. Stakeholders and potential users have not understood the current build of the NRSR register. There is a need to communicate better with the industry.
2. The purpose and processes of certification and registration are not widely understood.
3. The cost benefit of the implementation of the current NRSR register is not widely understood. It may be considerable when considering the amount of capital assets that could be better utilised.
4. The NRSR is potentially very costly for RSOs to implement because their existing certification records are not digitised. By regulating its use on new rolling stock the industry begins to lower the cost of implementation.
5. The variations in the certification processes are substantial in implementation. The breadth of standards nominated and the non-acceptance of certification from third parties are substantial opportunities for improved efficiency. There is an industry business case to standardise these around AS 7501.

HIGHLIGHTS

Achieving rolling stock approval harmonisation across Australia, requires cooperation, coordination and leadership by the industry. RISSB and Commonwealth and State transport agencies are required to deliver this work successfully, and it requires significant consultation and commitment.

9. DISCUSSION

There are significant opportunities for efficiency improvements, and these should be seen as an opportunity for industry to be working better together.

As the required changes have both a safety and efficiency management perspective the matter requires industry's cooperation and coordination with safety oversight provided, as now, by the rail safety regulator.

RISSB has a strong understanding of standards and processes and quite separately the Commonwealth government has the experience in implementing cross jurisdictional reforms. Both skills and processes are required to implement any proposal to address the concerns of the industry. Good coordination will mitigate unintended barriers to reform between both approaches. This requires a great deal of consultation and leadership.

Currently the RISSB certification and registration standards are in fact process standards. That is organisations follow an approved, and in fact regulated, process for approving vehicles onto their networks. Several of the RIMs do not have a documented process and the interface standards, if developed, are minimal and they informally rely on the neighbouring RIM to complete the assurance activities. Consequently, freight operators are understandably frustrated with those providing seemingly onerous requirements compared with the lowest common denominator.

The safety risk here is that the interfaces between the infrastructure and the train are not managed SFAIRP. The obvious safety issues with the RIMs is that they have incomplete vehicle registration processes and are focusing just on the efficiency opportunities.

The industry is significantly behind the rest of the transport sector in digitising its operating systems. RSO stakeholders noted that legacy certification data is not digitally recorded, and the task in gathering and inputting the data was not trivial. They advised that generally registration data was slightly better but that a lot of non-digital forms were still being generated.

Based upon the stakeholder interviews the desired state for the registration process can be summarised as:

a. Reduce paperwork and improve the efficiency of processing information.

b. Reduced variation in processing time and standards between RIMs.

c. Where practicable allow mutual recognition of Certification & Registration for vehicles & trains between RIMs.

d. A risk based rather than a compliance approach to recognition of third-party RIM certification and registration documents and data.

e. Standardised data definitions and data fields.

f. Common process for certification without applying the lowest common denominator that may reduce safety performance.

Stakeholders identified inefficiencies in the application process, which often involves duplicating information submissions across multiple organisations. This duplication not only slows down the registration process but also increases the administrative burden on rolling stock operators. There is certainly an opportunity to improve processing efficiency and speed, as demonstrated by the ARTC Aquipa registration process and the NRSR project.

Moreover, there is an inconsistency in the technical approach to defining minimum operating standards for vehicles. Some organisations require an excessive level of detail for registration, which can be seen as an unnecessary complication. The risk assessments of the interfaces should be provided and reviewed to support the interface requirements of RIMs on the freight operators. The RISSB Australian Rail Risk Model (ARRM) is well placed to assist all RIMs with this approach.

A more streamlined and standardised process is necessary. By reducing duplication, standardising and rationalising technical requirements, the industry can move towards a more efficient and effective certification and registration system.

This will not only benefit the operators in terms of reduced delays and costs but also enhance the overall safety and reliability of the rail network.

The way to proceed to address the concerns is at least twofold:

1. The forms and processes can be digitised to reduce the duplication of effort. The NRSR project with further funding is the best way to deal with this in the short term.
2. The harmonised data fields can be provided to each RIM through the NRSR system, while allowing acknowledged differences in RIM interface requirements to be identified.

The RIM Registration depends upon the management of interface hazards as highlighted in Figure 6. The next few options listed below were consulted widely but may need further development to arrive at an approach that can be easily adoptable:

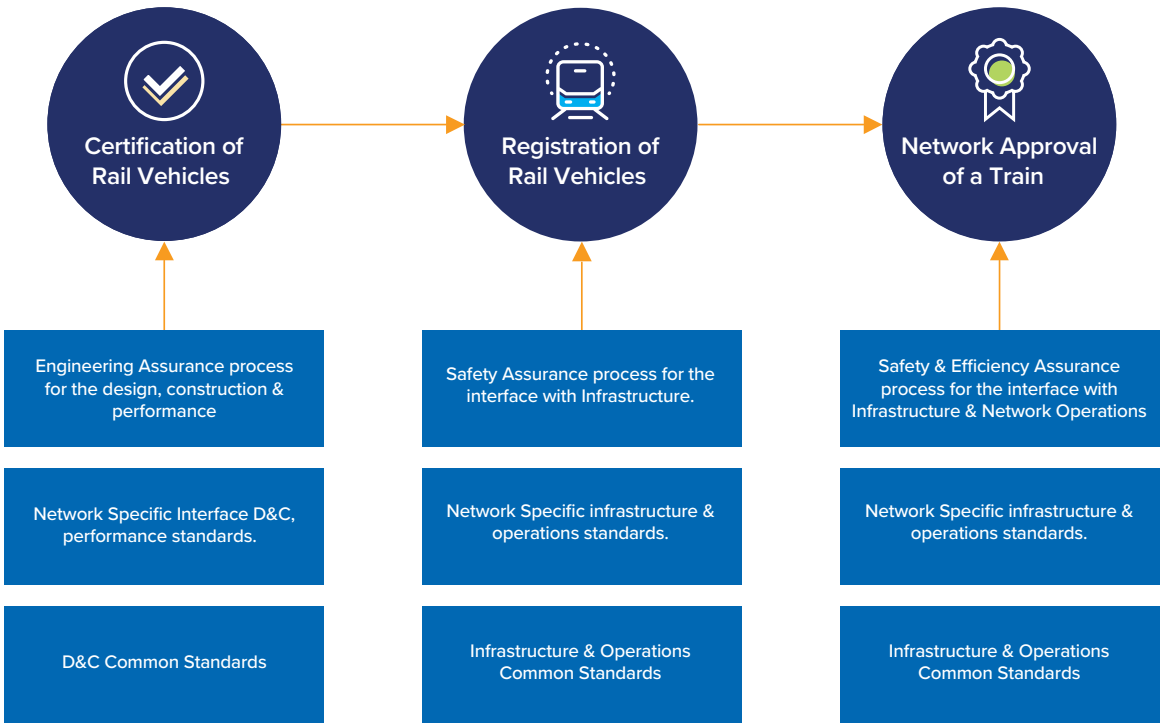
3. Reduce the certification requirements with RIMs to the interface static and dynamic performance requirements. In effect the design and construction requirements become self-certification processes by RSOs consistent with the co-regulation model and subject to ONRSR scrutiny.
4. Infrastructure and Operations common interface standards for registration are incorporated into an Australian Standard to compliment AS 7501 for certification.
5. Network specific differences are then managed on a safety risk basis that identifies the further controls the RIM requires to demonstrate a SFAIRP outcome.
6. Regulate the use of and the mutual recognition of the Certification and Registration standards to provide impetus for change.

The substantive industry business cost is the reduced utilisation and missed opportunity costs of delayed deployment of expensive capital equipment. An assessment of this can be expected to provide a strong business case for an expanded centralised, standardised and online NRSR project taking into account certification.

The NRSR project could be expanded as a program of projects, not just a database, with clearly stated industry outcomes. As detailed elsewhere in this paper this encompasses essentially 4 main topics:

- Governance over the functions and data security.
- Standardisation of certification standards adopting AS 7501 as a regulation if required.
- Standardisation of registration standards.
- A risk assessment from the RIM to support why they require more than the above information.

Figure 6: *RIM Registration depends upon the management of interface hazards.*



To achieve these industry outcomes, the required changes for a more effective outcome for the NRSR project may include:

1. A structured project governance over development.
2. Implement a project management and development methodology.
3. Provide program leadership to more than just the information technology aspects of the project.
4. Expand communication & consultation on outcomes and processes.
5. Recognition of certain barriers to the outcomes will require strong policy support.
   - Clarity of RIM & RSO roles and responsibilities,
   - Development and implementation of risk-based standards,
   - Recognise local route interface hazards, and
   - Certification standards.

In considering the above further with the aim of improving safety and efficiency, three frameworks appeared necessary.

1. Time frames for implementation
2. Any urgent matters, and
3. Alternative approaches

Table 5: *Opportunities for improvement of the registration processes.*

Opportunity	Short Term	Long Term
a. **Rationalise certification**	Regulate that AS 7501 process be required to certify new rolling stock.	Develop the NRSR register into a program of projects.
b. **Rationalise registration processes**	Implement the NRSR register for registration of maintenance rail vehicles.	Regulate that a vehicle registration is required to be recorded in NRSR system.
c. **Reduce barriers to operational interfaces**	Develop further national approaches to operational interfaces through CoP and Australian Standards.	Regulate for their future adoption.
d. **Reduce barriers to technical interfaces**	Fund planning for implementation of common technical platforms. Identify and plan the reduction of technical barriers that can be addressed.	Regulate that any new infrastructure and rolling stock reduces technical interfaces to enable the plan.

HIGHLIGHTS

The development of this White Paper drew upon extensive stakeholder interviews, analysis of current practices, and consideration of emerging industry initiatives. The recommendations result from careful consideration of the findings from the collected data, industry roles, and potential future developments of the National Rolling Stock Register project.

10. RECOMMENDATIONS

The following recommendations are made in the context of the scope of this report for further consideration:

i. Program of projects that address the barriers to increased efficiency. That program to consider the following:

   a. Fund the NRSR project for its full ambition and implementation to include certification into the system.

   b. Develop an Australian Standard for registration process to compliment certification standard AS 7501.

   c. The RISSB Australian Rail Risk Model to be promoted and developed further for certification and registration of vehicle hazards as the Good Practice approach.

   d. Including mutual recognition by RIMs of certification to AS 7501 process standard whilst allowing for a risk-based process in its application.

   e. Increased transparency of certification and registration processes promoted through the NRSR system.

   f. RISSB is best placed to lead a forum of RIMs to consider their collective approach to data register, data definitions and testing, and certification. The objective should be to harmonise and standardise the approaches as far as practical while still allowing for a risk-based approach.

ii. Rationalisation and standardisation of the data definitions and required data fields for certification and registration. This may also require consideration of the test methods.

iii. Seek ONRSR's acceptance of RSO self-assurance for certification. Within the proposed framework as proposed in this paper where further assurance can be sought by RIMs but only on the basis of a network hazard not being addressed by the certificates presented.

iv. Regulate to mandate mutual recognition of Certification documents as described in AS 7501 or their equivalents at a future point in time to provide impetus for harmonisation.

v. RISSB together with rail operators and infrastructure managers have a strong understanding of standards and processes and quite separately the Commonwealth government has the experience in implementing cross jurisdictional reforms. Bring these together as follows:

   a. Efficiency thought leadership led by a refocused RISSB. I note the approach of the UK RSSB on interoperability and efficiency that does not interfere with the independence and impartiality of the safety focus of ONRSR preserving the co-regulatory model.

   b. Program governance and regulation should come from the one government organisation - working closely with the RISSB facilitated processes. Efficiency regulations could become at cross purposes to rail safety regulations and should not be administered by ONRSR.

vi. Business case be developed for the national standardisation of certification and registration to an efficient online centralised process to support a program of works including a fully operational NRSR system covering certification.

APPENDIX A: ABBREVIATIONS

The terms used in this report are per the published RISSB glossary or as described in the report.

Abbreviation	Definition
ARRM	Australian Rail Risk Model
ARTC	Australian Rail Track Corporation.
DMU	Diesel Multiple Unit - a distributed powered passenger train made up of similar diesel powered and non-powered vehicles capable of carrying passengers and operating as a train.
EMU	Electric Multiple Unit - a distributed power electric passenger train made up of similar powered and non-powered vehicles capable of carrying passengers and operating as a train.
ICP	Independent Competent Person - a person accepted by the RSO, and the RIM as having practical and theoretical knowledge and experience in specified areas to examine, determine and record compliance of new or modified rolling stock against the referenced standards critically and capably.
NRSR	National Rolling Stock Register (RISSB project)
ONRSR	Office of the National Rail Safety Regulator (ONRSR) is an independent body corporate established under the Rail Safety National Law (South Australia) ACT 2012.
QR	Queensland Rail
RIM	Rail Infrastructure Manager - in relation to rail infrastructure of a railway, means the organisation who has effective control and management of the rail infrastructure, whether or not the organisation owns the rail infrastructure; or has a statutory or contractual right to use the rail infrastructure or to control or provide access to it.
RISSB	Rail Industry Safety And Standards Board, the standards organisation for the Australian Railway Industry
ROA	Railways of Australia.
RSIA	Rail Safety Interface Agreement is an agreement between a railway entity and another interfacing organisation setting out how hazards are managed between them.
RSNL	Rail Safety National Law
RSO	Rolling Stock Operator - a person who has effective management and control of the operation or movement of rolling stock on rail infrastructure for a railway but does not include a person by reason only that the person drives the rolling stock or controls the network or the network signals.
SFAIRP	So Far As Is Reasonably Practicable
SMS	Safety Management System
TfNSW	Transport for NSW
TOC	Train Operating Conditions

APPENDIX B: STAKEHOLDERS INTERVIEWED

Table 6: *RIM/RSO stakeholders interviewed.*

POSITION	ROLE
ARC Infrastructure	RIM
ARTC	RIM
Aurizon	RIM/RSO
Pacific National (PN)	RSO
PTA WA	RIM/RSO
QUBE	RSO
Queensland Rail (QR)	RIM
Rail First	RSO/ Rolling stock Owner
SCT	RSO
TfNSW	RIM/RSO
VLine	RIM/RSO
WATCO	RIM/RSO

APPENDIX C: HYPERLINKS TO DOCUMENTS

Table 7: *Stakeholders documents.*

Company	ROLE	
ARTC	RIM	https://extranet.artc.com.au/eng_rolling-stock.html (Rollingstock Standards) https://www.artc.com.au/customers/standards/route/access/ (Route Access Std) https://extranet.artc.com.au/eng_plant-equip-ex.html (P&E External) https://extranet.artc.com.au/eng_rolling-stock_procedure.html (Min Stds)
ARC Infrastructure	RIM	https://www.arcinfra.com/Rail-Network/Network-Specifications (Rollingstock Interface Requirements)
Aurizon	RIM/RSO	No published links.
ONRSR	Regulator	https://www.onrsr.com.au/safety-essentials/safety-messages/safety-message-maintenance-of-rolling-stock-assets-2 (RSO asset management)
Pacific National (PN)	RSO	No published links.
PTA WA	RIM/RSO	https://www.pta.wa.gov.au/our-system/freight-network (Access undertakings) https://www.pta.wa.gov.au/about-us/working-with-the-pta/safety-resources/safeworking-rules-and-procedures#Work-on-Track-393 (3019 Track Vehicles)
QUBE	RSO	No published links.
Queensland Rail (QR)	RIM/RSO	https://www.queenslandrail.com.au/forbusiness/access/access-undertaking (access undertaking, Interface Standard, Route)
ONRSR	Regulator	https://www.onrsr.com.au/publications/fact-sheets-guidelines-and-policies/guidelines (ONRSR Guidance Docs) https://www.onrsr.com.au/publications/national-rail-safety-register (Accredited organisations etc)
Rail First	RSO/Rolling Stock Owner	https://railfirst.com.au/
SCT	RSO	No published links.
TfNSW	RIM/RSO	https://www.transport.nsw.gov.au/TAHE/access (access undertakings) https://standards.transport.nsw.gov.au/search-standard-specific/?id=TBA%20-%200002377:2022 (Minimum Op Std) +++ https://standards.transport.nsw.gov.au/tocwaiver-standard/ (TOC Waiver)
VLine	RIM	https://corporate.vline.com.au/Network-Access/Network-service-plan (Network operating requirements and addenda)
WATCO	RIM/RSO	No published links.

APPENDIX D: ISSUES REGISTER

Issues and comments on the RISSB NRSR register project were:

i. RIM - “I’m concerned for the governance of the NRSR register and processes”.

ii. RIM - “There is not a strong business case for the NRSR register”.

iii. RSO - “There is a strong business case for the NRSR register”.

iv. RSO - Need a control board for NRSR registration development/management Policy issues.

v. RIM - Concerned with NRSR implementation not clear to them.

vi. RSO - considered sensitive commercial info may leak from NRSR.

vii. Large RSO - NRSR of benefit ready to share data but should align registration processes.

viii. Will not use RISSB NRSR as operating system will use as dBase.

ix. RSO advised their certification records, and a great number of the registration data are not digitised and they do not have the resources to translate them from the current archives.

x. RIM – They Register each carriage and Car Sets. Wondered if NRSR allows identification of sets?

xi. Difficult to see RSO’s having resources to provide data sets may be easier for RSO to have data agreement with RIM and RIM provides the data to RISSB.

xii. Issue - Certification/Accreditation/Registration confused.

xiii. Different data definitions for the same data e.g. draw gear length.

xiv. Data in docs not digitised.

xv. Issue is vehicle numbering and doubling up.

xvi. RIM - Suggested starting point is to list all the vehicle registration types/numbers.

Issues and comments on the RIMs train registration process were:

i. RIM - Registration is the appraisal of vehicles and Operating Conditions.

ii. RSO - too many forms.

iii. RSO - too many differences between processes.

iv. Improved implementation of the engineering safety assurance in some networks. “Lowest common denominator for registration is not good enough”.

v. Some “RIMs act like they are the regulator”. They should manage the RIM hazards and let the RSO manage theirs.

vi. Some RIMS mutually reportedly recognise the Certification and Registration information provided from other RIMS. (PTA & ARC Infrastructure as well as VLine accepting ARTC Registration).

vii. RSO/RIM - “High level all RIMs same” but each RIM processes applications and details differently - often resource constrained.

Issues and comments on the RIMs vehicle certification process were:

i. Certification – is an assessment of RS interface with Network Infrastructure Stds.

ii. Issue - RIM processing returns time consuming.

iii. For the RSOs certification processes and documentation are a bigger issue than registration of rolling stock.

iv. Issue – One RIM do their own testing do not accept certificates or ICP.

v. Some RIM different you follow process with them others you fill out form and apply.

vi. Issue - Certification needs harmonisation.

vii. QR and ARC registering/certifying vehicles not class of vehicles.

viii. Certification too onerous needs standardisation.

ix. 1 wagon requires 9 applications for certification in different forms requiring different information and some data definition difference.

x. Need to consider how Certification can be standardised as longer project deliverable.

xi. RIM - not ready to provide Certification data set.

xii. RIM – accepts others tests and able to under gap assessment to complete certification.

xiii. RSO - 1/2 day to fill out forms for three networks for one type of rake set.

xiv. RSO - Data points v different between RIMS.

xv. RSO - Data set in AS 7501 is too large not needed.

xvi. RIMs asking for data that is not used for their risk mitigation.

xvii. No one is asking qn on what are differences in stds?

xviii. RIM – Infrastructure stakeholders also drive risk tolerance.

APPENDIX E: COMPARING CERTIFICATION DATA SETS FOR DIFFERENT VEHICLE TYPES

The table below only shows a sample of vehicle types.

Locomotive[9]	Road Rail Vehicle[10]	Trolleys[11]
1. Owner and operator information - Owner - Operator - Declaration **2. Vehicle information and design** - Vehicle description - Vehicle dimensions - Rolling stock outline design - Vehicle track and civil interface and operating conditions - Traction details and operating conditions - Vehicle-to-vehicle interface and coupling - Vehicle structure and body - Bogies - Suspension - Wheels - Axles - Wheel and axle assembly - Axle bearings - Brakes system - Brake and pneumatic equipment. - Toilets - Marking and identification - Safety equipment **3. Vehicle static tests** - Static rolling stock outline test - Static vehicles weigh test - Static vehicle twist test - Static vehicle – bogie swing test - Static vehicle-vehicle swing test - Static brake test - Static (basic) kinematic test - Signal visibility test - Electrical safety inspection - Signal compatibility test - Signal/communication interference test - Safety system function test	**1. Owner and operator information** - Vehicle owner - Vehicle operator (if different from owner) - Declaration **2. Vehicle information and tests** - Vehicle description - Vehicle dimensions and masses - Vehicle documentation - Suspension and guidance gear - Transfer to and from rail - Rail wheels and wheelsets - Compliance plates - Brakes - Rolling stock outline - Vehicle identification and reflective zebra stripes - Protective structures - Electrical safety and height restrictors - Safety equipment - Ride performance test - Elevating work platforms (EWPs) - Vehicles with wireless control	**1. Owner and operator information** - Vehicle owner - Vehicle operator (if different from owner) - Declaration **2. Vehicle information and tests** - Vehicle description - Vehicle dimensions and masses - Vehicle documentation - Suspension and guidance gear - Transfer to and from rail - Rail wheels and wheelsets - Compliance plates - Brakes - Rollingstock outline - Marking & Identification - Electrical safety and height restrictors - Powered vehicles - Drawbars - Lighting - Ride performance test - Vehicles with wireless control

Locomotive[9]	Road Rail Vehicle[10]	Trolleys[11]
4. Vehicle dynamic tests - Static rolling stock outline test - Static vehicles weigh test - Static vehicle twist test - Static vehicle – bogie swing test - STATIC VEHICLE-VEHICLE SWING TEST - Static brake test - Static (basic) kinematic test - Signal visibility test - Electrical safety inspection - Signal compatibility test - Signal/communication interference test - Safety system function test **5. Vehicle dynamic tests** - Dynamic brake performance test - Ride performance test - Pitch and bounce test - Dynamic kinematic performance test - Traction performance test - Environmental tests		

9 Based upon TS 04060:1.0
10 Based upon T HR RS 00816 ST
11 Based upon T HR RS 00817 ST

E: info@rissb.com.au
PO Box 518
Spring Hill QLD 4004

RISSB.COM.AU

RISSB
RAIL INDUSTRY SAFETY AND STANDARDS BOARD