



National Signalling Assessment Framework

VERSION 2

30 Oct 2025

Version Control

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29 Sep 2023	1	Initial release
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1. PURPOSE

The National Signalling Assessment Framework (**the Framework**) underpins the Rail Industry Worker (**RIW**) System for ensuring the competence of signalling rail safety workers and compliance with the Rail Safety National Law (**RSNL**). The Framework provides a collaborative approach to assessment in the interest of portability of skills and supporting industry to increase the overall resource pool needed to deliver the increasing number of rail projects across Australia.

2. SCOPE

The Framework provides the guidance for RIW Cardholder's wishing to work in the rail industry where an assessment of competence is required. As detailed in the glossary in Section 5, this assessment can be in addition to the Australian Qualification Framework (**AQF**), or where not reasonably practicable to attain an AQF, the assessment confirms the RIW Cardholder has acquired the necessary qualifications / competencies, knowledge and generic skills to carry out rail safety work safely.

The assessment is targeted at generic and portable competence recognised by all Network Operators and removes the need for RIW Cardholder's to demonstrate generic competence on each network. However, where additional Network Endorsements are required to manage network risk, these authorisations are limited to truly domain requirements and not a duplication of generic requirements.

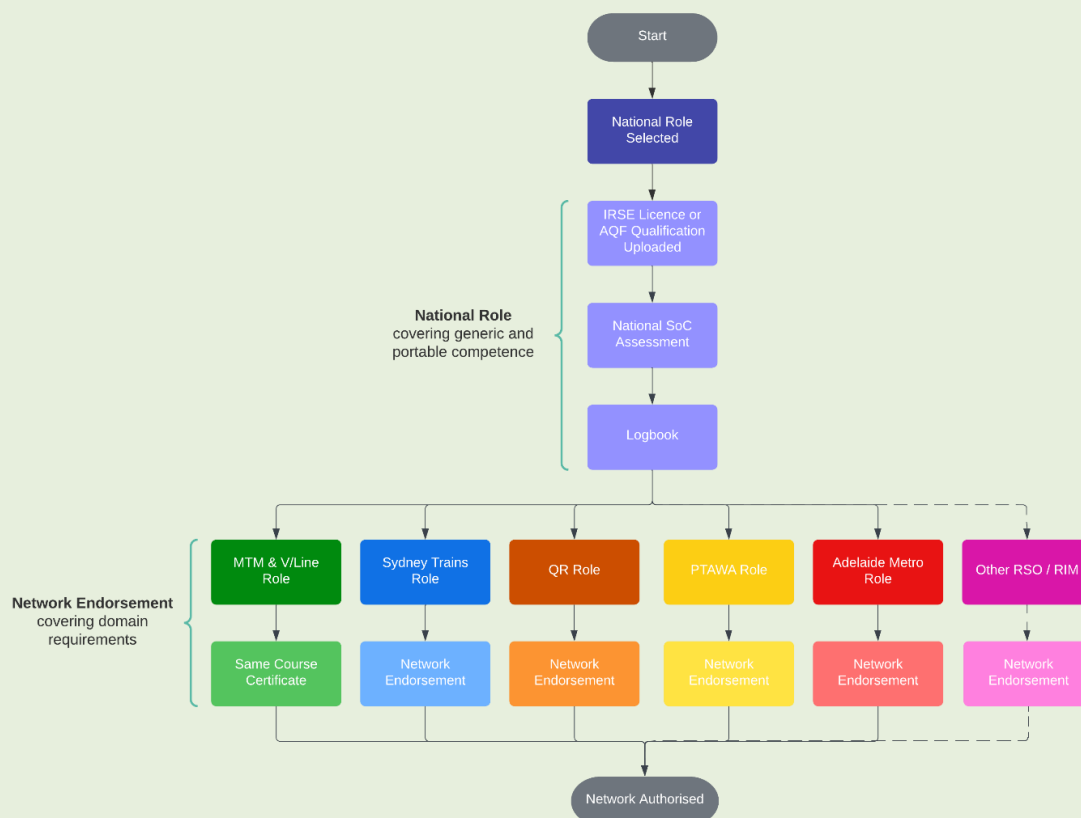


Figure 1 – High level overview showing National Roles and Network Endorsements¹

¹ Figure 1 is not an exhaustive list of all Network Operators, it's simply a graphic to show the relationship between a National Role and associated Network Endorsement. Refer Section 2.1.1 for further information on Network Endorsements

As shown in Figure 1, for a National Role to be valid, evidence of underpinning knowledge acquired via either an AQF qualification or Institution of Railway Signal Engineers (**IRSE**) licence **plus** a separate assessment completed by a National Signalling Assessor (**Assessor**), against the requirements of the relevant National Statement of Competence (**National SoC**) and supporting Logbook.

2.1.1. Network Endorsement

While every attempt has been made to harmonise generic requirements on the National SoC, RIW Cardholder's may require additional Network Endorsement / Authorisation to work on that network. These endorsements capture specific domain requirements, such as Safeworking Rules, Network Signalling Principles / Standards or Induction requirements.

Where Network Endorsements are required, RIW Cardholder's will need to hold the National Signalling Job Role (**National Role**) **plus** the Network Role of the same name to work on that network as shown in Figure 1.

Further information on which National Role(s) require further Network Endorsements and what that endorsement process entails, can be found on the RIW website².

3. THE FRAMEWORK

The overall Framework is an extension of the National RIW Competency Matrices and made up of the following supporting elements shown in Figure 2. These supporting elements and explained in the following sections.

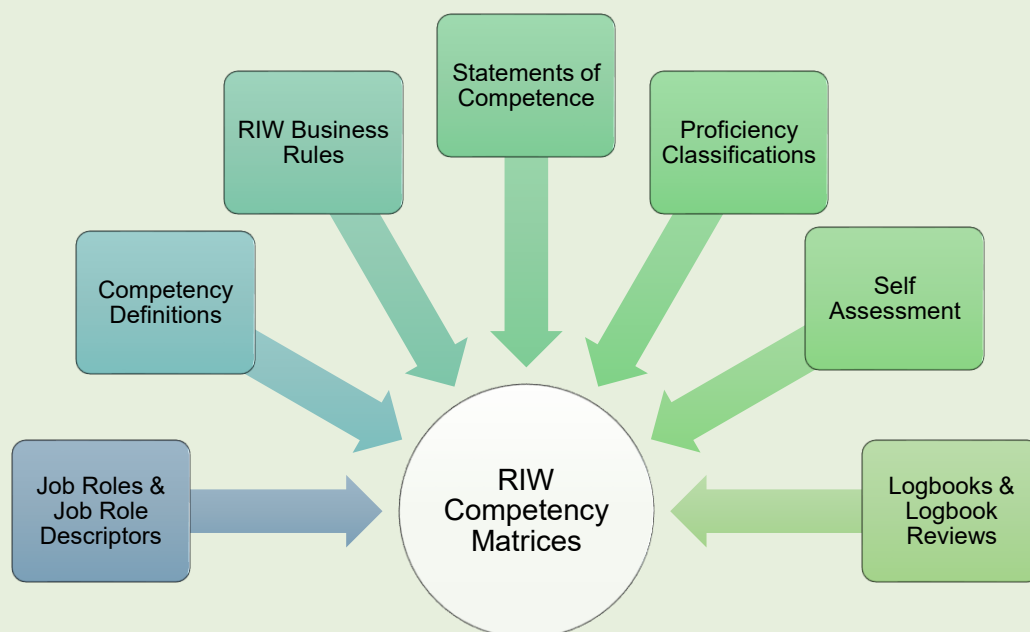


Figure 2 – The Framework

² <https://www.riw.net.au/business-rules/network-operators/>

3.1. National RIW Competency Matrices

National RIW Competency matrices are central to the Framework. The matrices are developed by the ARA with input from the relevant industry stakeholders and are considered the minimum competency requirements required to fulfil a job role.

In their simplest form, matrices consist of job roles on one axis and the competency requirements of the job role on the other axis. Refer to Section 6 for the National Signalling Matrix.

Note. These competency requirements do not measure cognitive skills, consider personal attributes/attitudes or beliefs or a substitute for professional development, the matrices are simply the minimum technical requirements to perform a National Role.

3.2. RIW System Job Roles and Job Role Descriptors

A job role refers to a particular task or set of actions that a RIW Cardholder has the competence to perform. Whereas the job role descriptor describes the functional area where the tasks may be performed. In the signalling discipline, these job role descriptors are aligned to the Rail Industry Safety Standards Board (**RISSB**) Standards and therefore key in minimising different interpretations across the rail industry and support a more objective assessment of a RIW Cardholder. The descriptor also outlines the role and responsibility expected of a RIW Cardholder performing the tasks of the job role.

Job roles can be categorised as National, Network or Employer as follows:

- National – a job role that is nationally recognised, such as National – Signalling Designer,
- Network – a job role that is specific to a network, MTM – Signalling Designer Authorisation, or
- Employer – a job role that is specific to an employer who has RIW Premium Functionality enabled in the RIW System.

3.3. Competency Definitions

As defined in Section 5, competency refers to evidence provided to demonstrate knowledge or the application of a task successfully and consistently. In the rail industry, the term competency refers to a number of requirements including qualifications, accreditations, validations and re-validation authorisations, currencies, and certifications.

Within the RIW System, job roles are often made up of multiple competencies that must be fulfilled for a job role to be valid. If any of the required competencies are not fulfilled, the job role will not be valid and the RIW Cardholder cannot work in that capacity, and similar to job roles, competency requirements may be set at National, Network or Employer levels.

3.4. RIW Business Rules

RIW Business Rules provide the minimum acceptance criteria for the verification of competency evidence by the RIW Service Desk agents or where applicable, an Assessor. Every competency in the RIW System is supported by a corresponding Business Rule to reduce errors and improve data quality.

3.5. National SoC

A National SoC is required to ensure initial and continuing proficiency of RIW Cardholders holding a National Role.

An approved Assessor will issue the populated and signed National SoC on completion of the assessment process. The National SoC will be uploaded into the RIW Cardholder's profile against the relevant National Role and will be recognised by other Network Operators.

Refer to Section 6 for the National Signalling Matrix to identify which role requires a National SoC, and Section 7, 9 & 11 for the Signalling Design, Testing and Technician / Electrician SoC's.

3.6. Proficiency Definitions

Assessors completing assessments against the respective National SoC's will use the following definitions to confirm a RIW Cardholder's ability to perform the tasks as described by the National SoC task definitions.

- **P1** – A RIW Cardholder has limited knowledge obtained through either formal training or experience. The RIW Cardholder requires supervision in more complex tasks and activities to allow that person to gain relevant experience. May perform simple tasks unsupervised where previous experience can be demonstrated. (Refer Section 5 for examples of simple tasks)
- **P2** – A RIW Cardholder who has sufficient knowledge through either formal training and/or experience allowing to work unsupervised in tasks and activities within the relevant experience. (Refer Section 5 for examples of complex tasks)

Prior to the release of this Framework, several Network Operators utilise a third proficiency level or subject matter expert proficiency. However, given the National Framework is aimed at supporting generic and portable competence, interpreting domain standards and principles does not sit at the National level and remains at a domain level. RIW Cardholder's should refer to the Network Operator's requirements for other proficiencies or endorsements.

3.7. Self-Assessment

As part of a RIW Cardholder's ongoing professional development, a RIW Cardholder should self-assess themselves outside of the RIW System supported by their Logbook and Workplace Supervisor. Where a self-assessment identifies a formal assessment is required, i.e., a RIW Cardholder wishes to move from 'work under supervision' to 'work unsupervised', or have tasks initially graded, a self-assessed SoC should be uploaded into the RIW System and submitted for assessment by the Assessor.

3.8. National Signalling Logbook

Logbooks are fundamental in demonstrating knowledge/experience and supporting the professional development of a RIW Cardholder. Acceptable Logbook templates can be adapted from the RIW Cardholder's organisation, Registered Training Organisation or other professional body like IRSE³ or RIW Cardholder's may use the example provided in Section 12. However, as a minimum the Logbook shall contain the following sections:

- **Witness status list** – first name & surname of the Workplace Supervisor, Organisation, RIW Number, current RIW Role(s), specimen signature/initial to validate countersigned Logbook entries and date.

³ <https://www.irse.org/Licensing/Licensing-documentation/Logbooks>

- **Record of Work Experience** – entries detailing the activities undertaken, including dates, employer/client or infrastructure owner, tasks/activities completed, equipment (if applicable) and area for the Workplace Supervisor to sign and any cross reference to the SoC.
- **Continue Professional Development** – including formal training, seminars, short courses, equipment course etc,
- **Logbook reviews** – Refer Section 3.9.

Note. The falsification of competence evidence identified by either the RIW Service Desk or Assessor will trigger an investigation under MTA's Fraud Control Plan. The results of the investigation will be reviewed by the National Rail Industry Worker Operations Committee (**NRIWOC**) and any other relevant parties, including Network Operators and the Office of the National Rail Safety Regulator (**ONRSR**). The outcome of these reviews could result in the suspension of the National Role and/or RIW Cardholder.

3.8.1. Workplace Validation

Evidence based assessment is a key feature of many assessment frameworks, i.e., the RIW Cardholder has been observed undertaking tasks in the workplace or participating in simulated activities and these activities have been entered in the Logbook and validated by the RIW Cardholder's Workplace Supervisor. It is essential the Workplace Supervisor is vocationally competent, i.e., holds the same role or higher plus a P2 level of proficiency.

Where the assessment is being completed by a Third-Party Assessor, a face-to-face or MS Teams/Zoom (or equivalent) meeting shall occur to support the Assessor in validating Logbook entries and assessment of proficiency. This meeting could also facilitate the RIW Cardholder providing additional evidence in support of any Logbook entry, or further discussions with the Workplace Supervisor(s).

Note. The inclusion of a face to face or MS Team/Zoom meeting for Third Party Assessor should mitigate the need for any assessment being rejected in the RIW System, as deficiencies can be resolved before the assessment process is complete.

3.9. Logbook Reviews

A Logbook review is important in validating the completeness of the Logbook. The review shall include a review of each Logbook section listed in Section 3.8. and shall include a section for comments, actions, dates for completion/follow up and confirmation any action has been completed.

These reviews shall be completed:

- Annually by the RIW Cardholder's Workplace Supervisor,
- Prior to job role is submitted for assessment, indicating the Logbook and the self-assessed SoC are ready for assessment, and
- When the Logbook is reviewed by the Assessor.

As with Logbooks, templates can be adapted from the RIW Cardholder's organisation, Registered Training Organisation or other professional body like IRSE⁴.

⁴ <https://www.irse.org/Licensing/Licensing-documentation/Logbooks>

3.10. Data Privacy

All competence evidence listed on the National Signalling Matrix and used in the assessment process under this Framework, shall be uploaded in the RIW System on the RIW Cardholder's profile. This is to ensure that all data can be managed as per the RIW Program Privacy policy⁵.

4. THE ASSESSMENT PROCESS

The Framework provides a learning pathway, and greater access to skills across industry, paving the way for mutual acceptance across states and jurisdictions, whilst continuing to meet the requirements of the RSNL. The framework aligns to the 70.20.10 model of learning where:

- 70% of learning comes from workplace experiences and assignments,
- 20% of learning comes from relationships with others and the feedback received. and
- 10% comes from formal training, courses, and workshops.

The National Signalling Matrix, the Model of Learning and the Framework demonstrates a blended approach to competency assessment.

Figure 3 links this model of learning to the assessment elements and requirements.



Figure 3 – Model of Learning

4.1. The Principles of Assessment

An effective assessment framework measures skills, knowledge, and attitudes of applicants. The assessment process in the Framework is closely aligned to the 'Principles of Assessment' to provide credibility of the assessment, as per the Registered Training Organisation Standards, developed by the Australian Skills and Qualifications Association (**ASQA**), these are outlined as follows:

⁵ <https://www.rlw.net.au/privacy-policy/>

- **Fairness** – The assessment process is available to all via the RIW Knowledge Centre and includes of an opportunity to challenge any assessment via the Appeals and Review Process.
- **Flexibility** – The assessment reflects the RIW Cardholder's needs and assesses proficiency no matter how or where RIW Cardholder's have acquired their knowledge.
- **Validity** – The assessment is supported by the practical application of proficiency overseen and ratified by a Workplace Supervisor in the RIW Cardholder's Logbook which is then assessed by an Assessor.
- **Reliability**: Assessors are required to utilise common assessment tools, definitions and outcome measures are comparable and recognised by all Network Operators who use the National Roles.

4.2. Types of Assessments

There are three types of assessment associated with the National Roles:

- **Initial assessment**: Completed the first time a RIW Cardholder is assessed against the requirements listed on the National Signalling Matrix for that role.
- **Upskilling assessments**: An assessment completed after the initial assessment and before the 5-yearly reassessment **or** where an upgrade (or downgrade) in proficiency is justified and requires formal assessment by an Assessor.
- **Renewal assessments**: An assessment completed 5-years post initial assessment.

Note. A Network Operator may require a RIW Cardholder to undertake additional training and/or assessment as part of any remedial activity post incident. However, whilst this would be captured in the RIW Cardholder's Logbook and National SoC, this assessment type is not categorised by any of the types listed above.

4.3. Assessment Tools

To support alignment, reliability of the assessment and objectivity of the Framework, nationally agreed assessment tools have been developed and will be utilised by the Assessor in determining proficiency levels defined by the Framework.

The following supporting elements as defined in Section 3, form the assessment tools used by the RIW Cardholder and Assessor:

- National SoC relevant for each National Role,
- Proficiency Classifications,
- Self-Assessments completed on the National SoC relevant for RIW Cardholder's National Role, and
- Supported by a current and complete Logbook.

4.4. How to become an Assessor?

RIW Cardholder's wishing to become an Assessor shall complete a Service Request⁶ via the RIW website by selecting the category 'Employer' and subcategory, 'Assessor account creation / Alteration to scope of assessments' and upload the completed form at Section 13.

⁶ <https://www.rlw.net.au/contact-us/request-a-service/>

The application process includes a sign-off by the applicant, a requirement for Network Operator sponsorship to substantiate the signalling knowledge and experience, and an alternative pathway to allow Network Operator employees to become assessors based on their employment as opposed to holding an RIW job role like Third Party Assessors.

The Service Desk will confirm the RIW Cardholder holds a valid National Signalling Assessor⁷ role on their profile before administering the applicable Business Rules on what roles the Assessor can assess. Once the service request is verified, access to the RIW System Assessor Portal will be granted.

Note. As part of adoption of the National Framework, each Network Operator will provide industry communications listing what existing signalling roles can assesses what National Role. This will allow existing Assessors, who are vocationally competent, to assess National Roles until they themselves transition to a National Role.

4.4.1. Assessor Communication

To support RIW Cardholder's with the assessment process, it is essential that once an Assessor logs into the RIW System Assessor Portal⁸ for the first time, 'Edit Assessor Notes' is selected and edited.

These notes appear when an RIW EA chooses to submit a role for assessment. The notes are a way for the Assessor to communicate for example, days they are available, rates, DO NOT SUBMIT during August 2024 as I will be on leave, mobile number or other communication means etc.

If a National Role is submitted for assessment and no notes are provided advising the RIW EA of an absence, there is no way for the Service Desk to intervene and reject the assessment on behalf of the Assessor to allow for an alternative Assessor to be selected. In this example, the RIW EA must wait until the Assessor returns from leave.

Other Knowledge Centre Articles (**KCA**) supporting the Assessor can be found on the RIW website⁹.

4.5. Submitting a Job Role for Assessment in RIW

KCA's exist outlining the process for 'How does a company submit or resubmit a job role for assessment'¹⁰, this includes:

- Uploading evidence of competence – refer to the National Matrix and relevant job role to understand what needs to be uploaded,
- Selecting an Assessor,
- Submitting the job role for assessment,
- Monitoring the status of the job role assessment, and
- Monitoring and resubmitting rejected assessments.

⁷ Refer to Section 6 to understand what competencies are required for the National Signalling Assessor role.

⁸ <https://support.riw.net.au/support/solutions/folders/51000257631>

⁹ <https://support.riw.net.au/support/solutions/folders/51000257631>

¹⁰ <https://support.riw.net.au/support/solutions/articles/51000030462-how-does-a-company-submit-or-resubmit-a-job-role-for-assessment>

RIW EA's and/or RIW Cardholder's can appeal the outcome of any assessment where resolution with the Assessor cannot be reached¹¹.

4.5.1. Completing the Assessment

As per Section 5, the Assessor shall ensure they are vocationally competent under this Framework. That is the RIW Cardholder holds a valid National Signalling Assessor Role plus:

- A valid National Role that is the same as the role being assessed or higher role and a P2 level
- OR
- A Network Operator employee who has had their vocational competence validated during the application process.

In both cases the application process allows the RIW Service Desk to configure the Assessor's portal with the correct roles for assessment.

Once a National Role has been submitted for assessment, the Assessor will use the tools listed in Section 4.3 to populate the National SoC based on the evidence submitted. It is essential the RIW Cardholder's Logbook has been updated to support the assessment including a recent Logbook review completed by the RIW Cardholder's Workplace Supervisor as per Section 3.9.

Note. Where a Logbook review hasn't occurred or where the Assessor wishes to confirm the vocational competence of the Workplace Supervisor listed in the Logbook witness list or the Assessor identifies a signature not listed on the Logbook witness, the Assessor must be aware of the RIW Cardholder relationship functionality within the RIW System to confirm vocational competence¹².

4.5.2. Assessment Notes

The Assessor shall utilise the Logbook review section of the Logbook and/or 'Assessment Notes'¹³ when reviewing evidence of competence within the RIW System. These Assessment Notes are important to the RIW EA when an assessment has been rejected to understand why before resubmitting the role for assessment.

4.5.3. Assessor Conduct

Where the conduct/performance of an Assessor has been identified that is contrary to the requirements of the Framework, or a dispute with a RIW Cardholder cannot be resolved, the National Rail Industry Worker Matrices Committee (**NRIWMC**) will be involved in identifying a resolution or remedial action.

4.6. General Framework Information

The following sections cover general information supporting the assessment process.

4.6.1. File types

As per the RIW System rules¹⁴ and outlined the following KCA, the maximum size of a singular file uploaded in the RIW System, such as competency evidence or rail health (medical) assessment, is 10

¹¹ <https://support.riw.net.au/support/solutions/articles/51000286664>

¹² <https://support.riw.net.au/support/solutions/articles/51000140852-what-are-the-different-types-of-cardholder-relationships-in-the-riw-system->

¹³ <https://support.riw.net.au/support/solutions/folders/51000257631>

¹⁴ <https://www.riw.net.au/wp-content/uploads/2021/04/RIW-System-Rules.pdf>

megabytes. Multiple file uploads are accepted, providing each singular file does not exceed 10 megabytes. Only files with *.jpg *.jpeg *.pdf and *.png extensions are permissible¹⁵.

4.6.2. Naming Conventions

There is no specific naming convention required for electronic file types, as each file is linked to specific areas within a RIW Cardholder's profile.

4.6.3. Statutory Declarations

RIW EA's & Cardholder's and Assessor's must ensure compliance to the relevant business rule applicable for each competence¹⁶ listed on the National Signalling Matrix, i.e., names on qualifications, must match that of the RIW Cardholder.

Where a RIW Cardholder's name has changed, usually through marriage etc, a Statutory Declaration can be uploaded into the RIW System under the 'Other Details' tab on a RIW Cardholder's profile¹⁷. Unfortunately, this tab is not visible via the Assessor's portal.

Unless the Assessor has another RIW System permission that provides access to the other details tab, the RIW Cardholder must provide a copy of the Statutory Declaration via alternative means to support the assessment.

4.6.4. Overseas Applications

Network Operator's may require a RIW Cardholder to hold a National Roles and/or Network Endorsement. RIW Cardholder's wishing to comply with these requirements must satisfy the Overseas Business Rules for International Qualifications, Stage 1 Competency Assessments or Migration Skills Assessments. Refer to the RIW website for further information¹⁸.

¹⁵ <https://support.riw.net.au/support/solutions/articles/51000029868-what-is-the-maximum-size-for-uploaded-files-and-what-format-should-they-be-in->

¹⁶ <https://businessrules.riw.net.au/support/solutions/folders/51000054195>

¹⁷ <https://support.riw.net.au/support/solutions/articles/51000168238-how-does-a-company-upload-a-statutory-declaration-to-a-cardholders-riw-profile->

¹⁸ <https://businessrules.riw.net.au/support/solutions>

5. GLOSSARY¹⁹

Term	Definition
Assessment of Competence²⁰	Rail transport operators must ensure that each rail safety worker (RSW) who is to perform rail safety work in relation to its railway operations has the competence to carry out that work safely. Assessment can be achieved via a worker being assessed against the AQF, assessment in addition to the AQF or where not reasonably practicable to attain an AQF, the worker has acquired the necessary qualifications and competencies applicable to that rail safety work and has knowledge and skills to carry out rail safety work safely.
Assessment	Assessment is the term given to the process of reviewing and approving a cardholder's National Role. Accompanying evidence is uploaded that requires an Assessor's validation.
Australian Qualifications Framework (AQF)	The AQF is the policy for regulated qualifications in the Australian education and training system. Refer https://www.aqf.edu.au .
Australian Skills Quality Authority (ASQA)	The is the national regulator for vocation education and training in Australia.
Australasian Railway Association (ARA)	The ARA is the owner and endorser of the Rail Industry Worker Program. The ARA is the peak body for the rail sector in Australia and New Zealand. The ARA represents more than 150 member organisations including passenger and freight operators, track owners and managers, suppliers, manufacturers, contractors and consultants. Members include listed and private rail-related companies, government agencies and franchisees. For more detailed information about the ARA, visit www.ara.net.au
Cardholder	A cardholder is a person who has an RIW profile and card they can also be referred to as the worker.
Competency	Within the RIW Program, competency is the ability and evidence provided to demonstrate knowledge or the application of a task successfully and consistently²¹. In the Rail Industry, the term competency refers to a number of requirements including qualifications, accreditations, validations and re-validation authorisations, currency, and certifications. There are some competencies such as Safeworking competencies that expire within a nominated time frame, which means that a cardholder would need to be re-assessed to remain competent in that capacity. A qualification or unit of competency issued under the Standards for RTOs can also be considered a competency. For the purposes of the RIW Program and the safety critical nature of the roles performed, although most

¹⁹ All definitions are consistent with those published on <https://support.rw.net.au/support/solutions/articles/51000141445>

²⁰ <https://nraspricms01.blob.core.windows.net/assets/documents/Policy/Application-of-the-AQF-to-Rail-Safety-Worker-Competence-Policy.pdf>

²¹ Similar in definition to Vocational Competence as defined by <https://www.asqa.gov.au/>

	qualifications/units do not expire, cardholders may be required to prove they have maintained the appropriate level of competency against certain units. A revalidation date will be shown in the RIW System for this purpose.
Competency Matrix	Is a collection of agreed generic skill and knowledge requirements for a task, for the rail safety worker to identify with or provide a pathway to minimum accepted competence for the rail industry.
Complex Tasks	Complex is defined as a task that is novel or unique in nature, work that requires the application of a worker's knowledge and skills in non-routine ways or work that has multiple simultaneous elements of risk. A swinging overlap with multiple sets of facing points is an example of simultaneous elements of risk.
Contractor in Charge (CIC)	This term is given to the company who has been allocated a 'Project' within the RIW System, and therefore is responsible for adhering to the requirements set by the Network Operator. This allocation of a Contractor in Charge is typically part of the contract award phase of a project and is conducted by the Network Manager/Operator.
Employer Administrator (RIW EA)	An Employer Admin is a permission in the RIW System who has full access rights to a company's functionality and the primary cardholders. A company's Employer Administrator primary use is to manage and monitor primary employees RIW profiles.
Joint Venture	Joint Venture – means, a project delivered by one of the RIW participant company with another entity; and where the Joint Venture does not have a standalone ABN/ACN.
National Rail Industry Worker Matrices Committee (NRIWMC)	The NRIWMC's role is to act as representatives of industry, to provide advice and guidance in developing and delivering standardised national job matrices, simplifying competency requirements, and providing consistency and transportability across participating rail operators. The NRIWMC may engage an industry working group to support specific work streams requiring specialist knowledge ²² .
National Rail Industry Worker Operations Committee (NRIWOC)	The NRIWOC's role is to act as representatives of industry, to provide advice and guidance to support the operational performance of the RIW Program in line with the RIW System Services Agreement and provide guidance to the Australasian Railway Association, as program owners, and Metro Trains Australia as the RIW Service Provider ²³ .
National Signalling Assessor (Assessor)	A RIW cardholder who is vocationally competent and holds a valid National Signalling Assessor Role on their profile to complete assessments under this Framework. Like all National Roles, the role is owned by the ARA, supported by the NRIWMC and working group and administered by the RIW Service Desk via the appropriate RIW Business Rule.
National Statement of Competence (National SOC)	A national recognised statement issued to a RIW confirming the worker has satisfied the requirements of the skills, knowledge and abilities pertaining to a National Role.

²² <https://www.riw.net.au/about-us/clients/>

²³ <https://www.riw.net.au/about-us/clients/>

Network Authorisation	A Network Authorisation complements the National Statement of Competence and is required of the Rail Safety Worker when carrying out rail safety work on participating rail networks across Australia. The network authorisation specifically captures domain specific requirements, Safeworking, access requirements and/or additional knowledge and skills requirements specific to that network domain.
Network Operator	Network Operator / Network Manager are terms used interchangeably in the RIW Program. However, in both cases the term refers to an accredited Rail Transport Operator, the custodian of the rail network under the RSNL.
Previous Experience	Witness logbook entries that have been assessed as satisfying the proficiency level requirements and therefore continue application of that proficiency.
Rail Industry Safety Standards Board (RISSB)	RISSB supports and works hand in hand with the Australian and New Zealand rail industry to provide the essential tools rail organisations need – good practice Standards, Codes of Practice, Guidelines and Rules. RISSB is the only accredited Standards development organisation for the rail industry in Australia and has a vast catalogue of more than 200 publications, all of which help industry improve safety, reduce costs and increase productivity and efficiency. RISSB publications can also be used in New Zealand ²⁴ . Refer to footnote for information on how to gain access to the member products. ²⁵
Rail Industry Worker (RIW)	Any individual who is issued a Rail Industry Worker card including without limitation any employees, agents, officers, contractors (or employees, officers or contractors of those contractors) or invitees (or employees, officers or contractors of those invitees) of the ARA or the ARA's Members. A RIW may or may not be performing rail safety work as defined in this document; however, the RIW competence can be confirmed within the RIW System.
RIW Card	Physical card which contains data linked with the RIW System for the purposes of identification of the cardholder and data captured regarding their job roles and competencies etc.
RIW Cardholder	A RIW who holds a valid RIW Card.
RIW Participant Organisations	Refers to Network Operators, Contractor's in Charge, Joint Venture and Employer Organisations who use the RIW System.
RIW System	The RIW System is the main system used by RIW System Users to manage a workforce. The RIW System is used to send employment requests, manage cardholder profiles including uploading competencies and job roles and ordering cards for cardholders.

²⁴ <https://www.rissb.com.au/about/our-role-in-industry/>

²⁵ <https://www.rissb.com.au/membership/member-sign-up/>

RIW Knowledge Centre Articles (RIW KCA)²⁶	The RIW Knowledge Centre is the central self-help library of articles to support end users on all aspects of the RIW Program and RIW System functionality.
RIW Program	The Rail Industry Worker Program (RIW) is a national competency and safety management system for workers in the Australian rail industry. It provides a single electronic record of their health, education and competencies as they work across projects, move between employers and operate on different state networks. The RIW Program helps the rail industry meet its fitness for duty and competency obligations under RSNL. The Australasian Railway Association (ARA) established the RIW Program in 2012 and engaged Metro Trains Australia (MTA) to support its delivery on 28 June 2019.
Rail Safety National Law (RSNL)	RSNL is an act to make provision for a national system of rail safety. First enacted in South Australia in 2012, it is now administered by the Office of the National Rail Safety Regulator (ONRSR or “the Regulator”). All other states and territories have either adopted the RSNL or passed legislation that models it.
Rail Safety Worker²⁷	The RSNL identifies a rail safety worker (s.4) as any individual who has carried out, is carrying out, or is about to carry out rail safety work (s.8(1)), which includes: a. driving or despatching rolling stock or any other activity which is capable of controlling or affecting the movement of rolling stock; b. signalling (and signalling operations), receiving or relaying communications or any other activity which is capable of controlling or affecting the movement of rolling stock; c. coupling or uncoupling rolling stock; d. constructing, maintaining, repairing, modifying, monitoring, inspecting or testing – i. rolling stock, including checking that the rolling stock is working properly before being used; or ii. rail infrastructure, including that the rail infrastructure is working properly before being used; e. installation of components in relation to rolling stock; f. work on or about rail infrastructure or associated works or equipment that places, or may place, the person performing the work at risk of exposure to moving rolling stock; g. installation or maintenance of – i. a telecommunications system relating to rail infrastructure or used in connection with rail infrastructure; or ii. the means of supplying electricity directly to rail infrastructure, any rolling stock using rail infrastructure or a telecommunications system; h. work involving certification as to the safety of rail infrastructure or rolling stock or any part or component of rail infrastructure or rolling stock;

²⁶ <https://support.riw.net.au/support/solutions>

²⁷ <https://nraspricms01.blob.core.windows.net/assets/documents/Guideline/Guideline-Identifying-Rail-Safety-Work-Under-the-RSNL.pdf>

	i. work involving the decommissioning of rail infrastructure or rolling stock or any part or component of rail infrastructure or rolling stock; j. work involving the development, management or monitoring of safe working systems for railways; k. work involving the management or monitoring of passenger safety on, in or at any railway.
Shall	Implies certain actions are mandatory, i.e., Where the assessment is being completed by a Third Party Assessor, a face-to-face or MS Teams/Zoom (or equivalent) meeting shall occur to support the Assessor in confirming Logbook entries used to support assessment of proficiency
Simple Tasks	For Design, simple tasks include: • Work that is detailed/described in standards, procedures or • Design tasks that are based on other very similar or pre-existing designs, i.e., Object Controller Circuit Design, Data Design as per template or Application Logic Data Specification, Location Power Design, Signalling Apparatus Plan all excluding cross boundary. For Test, simple tasks include: • Work that is detailed/described in standards, procedures or work instructions (except for work instructions that deal with complex tasks). • Work that is deemed simple including Verification Testing off all installations, Function Testing of Greenfield Circuit, Control Table & Principles Testing of Greenfield areas with prescribed interfaces, Railway Crossings with no Signal Interlocking. • Work that is repetitive in nature, i.e., wire count, null count, bell test etc For Maintenance, simple tasks include: • Work that is detailed/described in standards, procedures, and service schedules that poses no risk to the integrity or reliability of the signalling system. For example, ○ Like for like replacement of a points mechanism where a no bridging authority is required. ○ Testing, adjusting and certifying a facing point lock and detection during maintenance or after a failure. • Investigating and certifying right side failures of the signalling system
Sufficient Knowledge	The quality, quantity and relevance of the knowledge enables an assessed judgement to be made of a RIW Cardholder's proficiency.
Third Party Assessor	An Assessor who does not work in the same organisation as the RIW Cardholder.
Vocationally Competent Assessor	That is the RIW Cardholder holds a valid National Signalling Assessor Role <u>plus</u>: • A valid National Role that is the same as the role being assessed or higher role and a P2 level

	<u>OR</u> • A Network Operator employee who has had their vocational competence validated during the application process. Note. Refer to Section 4.4 regarding what existing Signalling roles are permitted to assess what National Role until the RIW Cardholder has transitioned to a new National Role.
Workplace Supervisor	A Workplace Supervisor is a colleague, peer or line manager (within the same organisation, alliance, project etc) who oversees task completion and who holds a higher level of proficiency in the task, skills or activity being completed. A Workplace Supervisor supports the RIW's self-assessment of competence, recommending to the Assessor when the RIW is ready to be assessed. Workplace Supervisors often work with the RIW in determining when they may be ready for a National Assessment to confirm the worker is competent.

6. NATIONAL SIGNALLING MATRIX

Note. The Design, Testing and Maintenance Matrices have been separated for ease of viewing but are still collectively referred to as the National Signalling Matrix.

National Signalling Matrix		National Roles/Functions								
		Signalling Assistant Designer	Signalling Designer	Signalling Principles Designer	Signalling Assistant Tester	Signalling Verification Tester	Signalling Function Tester	Signalling Principles Tester	Signalling Tester in Charge	Signalling Assessor
Requirements	National Requirements									
Medical	Railway Medical Categories (1 or 2 or 3)	#	#	#	#	#	#	#	#	
Access	Safely Access the Rail Corridor – TLIF2080/TLIF0020	#	#	#	#	#	#	#	#	
	Work Safely in the Construction Industry – CPCCOHS1001	#	#	#	#	#	#	#	#	
Qualifications	Master of Signalling and Telecommunications	1M	1M	1M	1M	1M	1M	1M	1M	
	Master/Bachelor of Engineering (Electrical)	1M	1M	1M	1M	1M	1M	1M	1M	
	Master/Bachelor of Engineering (Information Technology)	1M	1M	1M	1M	1M	1M	1M	1M	
	Master/Bachelor of Engineering (Mechanical)	1M	1M	1M	1M	1M	1M	1M	1M	
	Master/Bachelor of Engineering (Mechatronics)	1M	1M	1M	1M	1M	1M	1M	1M	
	Master/Bachelor of Engineering (Science)	1M	1M	1M	1M	1M	1M	1M	1M	
	Master/Bachelor of Engineering (Telecommunications)	1M	1M	1M	1M	1M	1M	1M	1M	
	Master/Bachelor of Technology	1M	1M	1M	1M	1M	1M	1M	1M	
	Graduate Diploma of Signalling and Telecommunications <i>(See Note 1)</i>	1M	1M	1M	1M	1M	1M	1M	1M	
	Graduate Certificate in Signalling and Telecommunications <i>(See Note 1)</i>	1M	1M	1M	1M	1M	1M	1M	1M	
	Graduate Diploma of Railway Signalling <i>(See Note 1)</i>	1M	1M	1M	1M	1M	1M	1M	1M	
	Graduate Certificate in Railway Signalling <i>(See Note 1)</i>	1M	1M	1M	1M	1M	1M	1M	1M	
	10780NAT – Graduate Diploma in Rail Signalling	1M	1M	1M	1M	1M	1M	1M	1M	
	22593VIC – Graduate Diploma of Railway Signalling	1M	1M	1M	1M	1M	1M	1M	1M	
	22596VIC – Graduate Certificate in Railway Signalling	1M	1M	1M	1M	1M	1M	1M	1M	
	UEE62220 – Advanced Diploma of Electrical – Engineering	1M	1M	1M	1M	1M	1M	1M	1M	
	52726WA – Advanced Diploma of Applied Electrical Engineering	1M	1M	1M	1M	1M	1M	1M	1M	
	UEE63020 – Advanced Diploma of Electrical Systems Engineering	1M	1M	1M	1M	1M	1M	1M	1M	
	UET60222 – Advanced Diploma of ESI – Power Systems	1M	1M	1M	1M	1M	1M	1M	1M	
	UEE62111 – Advanced Diploma of Engineering Technology – Electrical	1M	1M	1M	1M	1M	1M	1M	1M	
	UEE50420 – Diploma of Electrical Engineering	1M	1M	1M	1M	1M	1M	1M	1M	
	UEE53020 – Diploma of Electrical Systems Engineering	1M	1M	1M	1M	1M	1M	1M	1M	
	UET50221 – Diploma of ESI - Power Systems	1M	1M	1M	1M	1M	1M	1M	1M	
	Cert IV in Relevant Field <i>(See Note 2)</i>	1M	1M	1M	1M	1M	1M	1M	1M	
	UEE41223 – Cert IV in Electrical – Rail Signalling	1M	1M	1M	1M	1M	1M	1M	1M	
	Non-Washington Accord Degrees <i>(See Note 3)</i>	1M			1M					
	Formal training evidence <i>(See Note 4)</i>	1M			1M					

National Signalling Matrix

		National Roles/Functions								
		Signalling Assistant Designer	Signalling Designer	Signalling Principles Designer	Signalling Assistant Tester	Signalling Verification Tester	Signalling Function Tester	Signalling Principles Tester	Signalling Tester in Charge	Signalling Assessor
Requirements	National Requirements									
IRSE (See Note 7)	Signalling Assistant Designer	1M								
	Signalling Designer		1M							
	Signalling Design Verifier		1M							
	Signalling Principles Designer			1M						
	Signalling Test Assistant				1M					
	Signalling Verification Tester					1M				
	Signalling Function Tester						1M			
	Signalling Principles Tester							1M		
	Signalling Tester in Charge								1M	
	IRSE Exams (See Note 5)		1M	1M				1M		
	MIRSE or FIRSE (See Note 6)		1M	1M		1M	1M	1M	1M	
Unit of Competency	TAEASS412 – Assess Competence									M
Statement of Competence	Signalling Designer		M							
	Signalling Principles Designer			M						
	Signalling Verification Tester					M				
	Signalling Function Tester						M			
	Signalling Principles Tester							M		
	Signalling Tester in Charge								M	
Logbook	Logbook		M	M		M	M	M	M	

Notes.
(1) Graduate Diploma and Graduate Certificate courses registered in the Higher Education Sector do not have a course code like their equivalent qualification registered in the VET Sector. These Higher Education Qualifications are managed via the Tertiary Qualification Business Rule used for Bachelor and Master Degrees.
(2) The following are acceptable equivalents: 21730VIC Cert IV in Rail and Tram Signal Systems, UTE40499 Cert IV in Electro Technology – Computer Systems (Spec in Control) and PTC Signal Maintenance Technician Course (Certificate).
(3) This allows overseas workers to commence their skills development with a Non-Washington Accord Degree.
(4) This role now supports RSW's who have commenced formal AQF training but are yet to complete it. RSW's wishing to comply with any of these Assistant Roles shall upload evidence from the Registered Training Organisation where they are enrolled that demonstrates formal training has commenced. Refer to National Business Rules for evidence that satisfies this note. ²⁸
(5) Evidence the RIW Cardholder has completed IRSE Exams (All Modules).
(6) MIRSE and FIRSE process involves a process of validating both, qualifications and experience - refer https://www.irse.org/Membership/Membership-Options .
(7) Refer to IRSE website for a list of Assessing Agencies and a list of licence categories they offer https://www.irse.org/Licensing/Assessing-Agencies
M = Mandatory
1M = At least one of the items is mandatory
A Network Operator role (including a medical) will be required if entering the rail corridor

²⁸ <https://businessrules.riw.net.au/support/solutions/folders/51000054195>

National Signalling Matrix

		National Roles/Functions						
		Signalling Electrician (Maintenance)	Signalling Technician	Signalling Electrician (Installer)	Signalling Electrician (in training)	Signalling Field Engineer (Pathway 1)	Signalling Field Engineer (Pathway 2)	Signalling Maintainer (Mechanical)
Requirements	National Requirements							
Medical	Railway Medical Categories (1 or 2 or 3)	M (Cat 1)	M (Cat 1)	M (Cat 1)	M (Cat 1)	#	#	#
Access	Safely Access the Rail Corridor - TLIF2080/TLIF0020	M	M	M	M	#	#	#
	Work Safely in the Construction Industry - CPCCOHS1001	M	M	M	M	#	#	#
Qualifications	Master of Signalling and Telecommunications		1M			1M		
	Master/Bachelor of Engineering (Electrical)		1M			1M		
	Master/Bachelor of Engineering (Information Technology)		1M			1M		
	Master/Bachelor of Engineering (Mechanical)		1M			1M		
	Master/Bachelor of Engineering (Mechatronics)		1M			1M		
	Master/Bachelor of Engineering (Science)		1M			1M		
	Master/Bachelor of Engineering (Telecommunications)		1M			1M		
	Master/Bachelor of Technology		1M			1M		
	Graduate Diploma of Signalling and Telecommunications <i>(See Note 1)</i>		1M			1M		
	Graduate Certificate in Signalling and Telecommunications <i>(See Note 1)</i>		1M			1M		
	Graduate Diploma of Railway Signalling <i>(See Note 1)</i>		1M			1M		
	Graduate Certificate in Railway Signalling <i>(See Note 1)</i>		1M			1M		
	10780NAT – Graduate Diploma in Rail Signalling		1M				1M	
	22593VIC – Graduate Diploma of Railway Signalling		1M				1M	
	22596VIC – Graduate Certificate in Railway Signalling		1M				1M	
	UEE62220 – Advanced Diploma of Electrical – Engineering		1M				1M	
	52726WA – Advanced Diploma of Applied Electrical Engineering		1M				1M	
	UEE63020 – Advanced Diploma of Electrical Systems Engineering		1M				1M	
	UET60222 – Advanced Diploma of ESI - Power Systems		1M				1M	
	UEE62111 – Advanced Diploma of Engineering Technology - Electrical		1M				1M	
	UEE50420 – Diploma of Electrical Engineering		1M				1M	
	UEE53020 – Diploma of Electrical Systems Engineering		1M				1M	
	UET50221 – Diploma of ESI – Power Systems		1M				1M	
	Cert IV in Relevant Field <i>(See Note 2)</i>		1M				1M	
	UEE41223 – Cert IV in Electrical – Rail Signalling	M	1M				1M	
	UEE30820 – Cert III in Electrotechnology Electrician		1M	M				
	UEE33020 – Certificate III in Electrical Fitting		1M					
	TLI31921 – Certificate III in Mechanical Rail Signalling							1M
	Formal training evidence <i>(See Note 3)</i>				1M			

National Signalling Matrix

		National Roles/Functions						
		Signalling Electrician (Maintenance)	Signalling Technician	Signalling Electrician (Installer)	Signalling Electrician (in training)	Signalling Field Engineer (Pathway 1)	Signalling Field Engineer (Pathway 2)	Signalling Maintainer (Mechanical)
Requirements	National Requirements							
IRSE	MIRSE or FIRSE (See Note 4)					1M		
Unit of Competency	Assemble and wire internal electrical rail signalling equipment			M				
	Install and maintain rail track circuit leads and bonds			M				
	Test copper rail signalling cables			M				
	Repair rail signalling power and control cables			M				
Statement of Competence	Signalling Maintenance SoC	M	M	M				
Logbook	Logbook	M	M	M		M	M	M

Notes.
(8) Graduate Diploma and Graduate Certificate courses registered in the Higher Education Sector do not have a course code like their equivalent qualification registered in the VET Sector. These Higher Education Qualifications are managed via the Tertiary Qualification Business Rule used for Bachelor and Master Degrees.
(9) The following are acceptable equivalents: 21730VIC Cert IV in Rail and Tram Signal Systems, UTE40499 Cert IV in Electro Technology – Computer Systems (Spec in Control) and PTC Signal Maintenance Technician Course (Certificate).
(10)This role now supports RSW's who have commenced formal AQF training but are yet to complete it. RSW's wishing to comply with any of these Assistant Roles shall upload evidence from the Registered Training Organisation where they are enrolled that demonstrates formal training has commenced. Refer to National Business Rules for evidence that satisfies this note. ²⁹
(11)MIRSE and FIRSE process involves a process of validating both, qualifications and experience - refer https://www.irse.org/Membership/Membership-Options .
M = Mandatory
1M = At least one of the items is mandatory
A Network Operator role (including a medical) will be required if entering the rail corridor

²⁹ <https://businessrules.riw.net.au/support/solutions/folders/51000054195>

7. NATIONAL SIGNALLING DESIGN SOC

National Statement of Competence for a – Please Select a Role

Concept Design (Scheme Design)		Proficiency
Aspect Sequences		Proficiency Level
Braking Calculations & Headway Validation		Proficiency Level
Signalling Arrangement Plan		Proficiency Level
Train Vacancy/Detection Architecture		Proficiency Level
Control Tables		Proficiency Level
Detailed Design (Application / Interlocking)		Proficiency
Interlocking Design (CBI)		Proficiency Level
Interlocking Design (RRI)		Proficiency Level
Interlocking Design (Relay/Geo)		Proficiency Level
Interlocking Design (Interface, Cross Boundary and Relay)		Proficiency Level
Train Vacancy/Detection Design		Proficiency Level
Bonding Plan (Train Detection, Signalling Apparatus and Bonding Plan)		Proficiency Level
Object Controller Data Design (No Locking) (Design Using ALDS/ICD)		Proficiency Level
Power Calculations and Cable Running Plan		Proficiency Level
Axle Data Design		Proficiency Level
Railway Crossing Circuit Design (Design Using Typical Circuits)		Proficiency Level
Trackside Circuit Design (Design Using Typical Circuits)		Proficiency Level
Proficiency Definitions		
P1 – A RIW Cardholder has limited knowledge obtained through either formal training or experience. The RIW Cardholder requires supervision in more complex tasks and activities to allow that person to gain relevant experience. May perform simple tasks unsupervised where previous experience can be demonstrated.		
P2 – A RIW Cardholder who has sufficient knowledge through either formal training and/or experience allowing to work unsupervised in tasks and activities within the relevant experience.		
RIW Cardholder		
Name:		RIW Number:
Signature:		Date:
Certification by Assessor:		
Name:		RIW Number:
Signature:		RIW Role:
		Date:

8. TASK DEFINITIONS – SIGNALLING DESIGN

Concept Design (Scheme Design)	
Design Artifact	Definition
Braking Calculations and Headway Verification	The purpose of this task is to determine the position a train will stop or slow to specified speed based on train braking characteristics and gradient then verify that the positions provide the required throughput of trains. This task uses the Signalling Arrangement Plan or Concept design to ensure the position of signals, overlaps etc provide adequate braking distances. The calculation of the braking distances uses inputs from: • Rolling Stock parameters, • Track and Civil Design, and • Signalling Design. The Project Requirements will determine the required headway in order to operate the working timetable. Once the SAP has been designed, the signal positioning needs to be used to verify that the headway can be met.
Signalling Arrangement Plan (SAP)	The purpose of this task is to define the signalling arrangement for the signalling system bounded by the project scope, in the form of a SAP. The SAP is the top-level signalling design document. This task uses the concept design, and considers existing installation, site constraints, rolling stock parameters, etc, to refine the concept SAP to the desired design. The task includes (but is not limited to): • Positions of the signals to allow for optimum signal spacing to achieve the desired headway, • Positions of air gaps in traction power, • Position of signalling components that interacts with the signals, • Position and limits of train detection equipment and systems, • Position of station platforms, • Position of signal overlaps, • Position and types of train protection, • Position of points, crossings, turnouts, • Position of railway crossings, • Identification of railway crossing activation and holding controls, • Undertake initial signal sighting assessment, • Additional information signage to accompany the signalling, • Track grades and curves, • Line speeds and speed restrictions, and • Initial Signal Sighting (desktop).

Control Tables	The purpose of this task is to present the information from the SAP into tabulated functional or locking requirements. The Control Tables shows the requirements for locking and releasing of the signal interlocking including signals, movable infrastructure, train detection, train protection, enforcement and railway crossings conditions to be satisfied in order for a route to be set, locked and subsequently released. The aspect sequencing information is taken from the Control Tables to produce as aspect sequence chart for each direction of travel. The task includes (but is not limited to): • Condition of the route for aspect to clear, • Condition of the overlap for the aspect to clear, • Conditions of the track circuit, • Railway crossing conditions, • Condition of the tracks for point/other moveable infrastructure movement, • Conditions of swinging overlaps, • Aspect Sequence condition for signal in advance, • Axle Counter reset conditions (if in interlocking), • Axle Counter supervisory reset if over points, • Railway Crossing controls, • Railway Crossing progression controls, • Timer values for clearing aspects, and • Timer values for approach locking. Note: Different interlockings or signalling systems may require different types of information or representation. This may result in a variance of Control Table styles.
Aspect Sequences	A signalling plan that identifies the aspect sequence between signals. The chart shows all signals for a given direction of travel, their aspects, and the interconnection between aspects in following signals that provide the advance signalling. The creation of this is an output from the completion of control tables.
Axle Counter Architecture	The purpose of this task is to provide a high-level diagram showing the connections between all Axle Counter systems and communication to the wheel detector. The Axle Counter Architecture must consider how features on axle counters such as double usage head, supervisory section is used. The Axle Counter Architecture is crucial to assist with the resetting of axle counter sections. The Axle Counter Architecture should be a geographical representation in relation to signalling assets. The task includes (but is not limited to): • Wheel detector positions, • Wheel detector identification,

- Track section number,
- Supervisory section allocation (if applicable),
- Double usage head control (if applicable),
- Identification of which rail it is mounted on,
- What processor is counting which head,
- IP Addresses as required,
- Switch and router connection ports as applicable,
- Communication bearers,
- Communication protocol used,
- System dip switches/Jumpers (if applicable), and
- Controlling CBI (if applicable).

Note: The relationship between the Axle Counter Overview / Architecture with the Signalling Network Architecture, Control Tables and Track Circuit, Bonding and SAP is non-linear. The information in these need to be verified against each other prior to design approval.

Detailed Design (Application / Interlocking)

Design Artifact

Competency Definition

Interlocking Design (Computer Based Interlocking (CBI))

The purpose of this task is to provide system specific configuration data for Interlocking/Object controllers.

The interlocking is classified as SIL 4 systems and provide confidence that the processing of the system reduces the chance of wrong side failure. This requires designer to be aware of the safety related application conditions and design within the parameters. This requires a robust design/check/test process.

Where the system is not SIL 4, greater responsibility is held by the RTO/State to ensure that the system operates safely through a site-specific safety case to design the locking that prevents unsafe conditions that could lead to unsafe train movements.

The interlocking uses status information from the trackside equipment (Signals, points/Other moveable infrastructure, Tracks and Train Protection) to ensure that any authorised train moves are compliant for the Signalling Principles. The interlocking receives commands from the train control system and determines if it is safe to action the commands. If it is safe, the interlocking sends controls to 'drive' output to move points/other moveable infrastructure, train protection and signal aspects.

The task includes (but is not limited to):

- Locking of signalled routes,
- Locking of signal overlaps,
- Locking of signal approaches,
- Operation of railway crossing protection,

	• Operation and suppression of train protection systems, • Releasing of locking, • Timed clearing of signal aspects, • Application of vital signalling timers, • Application of signal asset blocking, and • Communication of local commands and indication to Object Controllers. • Clearing of Aspects • Locking for Flank Protection. • Swinging overlaps • Slotting Request and Acceptance Note: The object controllers may be straight mapping of bits between the interlocking and the trackside equipment or may include some simple data that can be controlled locally. Object Controllers are considered part of the interlocking component and cannot operate without the interlocking. The interlocking/object controller can be mechanical, electro-mechanical or CBI. New and/or updated sites should be CBI.
Interlocking Design (Route Relay Interlocking (RRI))	The purpose of this task is to provide signalling interlocking design or modification to the signalling system using RRI principles. To design the locking that prevents unsafe conditions that could lead to unsafe train movements. The interlocking uses status information from the trackside equipment (Signals, points/Other moveable infrastructure, Tracks and Train Protection) to ensure that any authorised train moves are compliant for the Signalling Principles. The interlocking receives commands from the train control system and determines if it is safe to action the commands. If it is safe, the interlocking controls equipment to move points/other moveable infrastructure, train protection and signal aspects. The task includes (but is not limited to): • Locking of signalled routes, • Locking of signal overlaps, • Locking of signal approaches, • Operation of railway crossing protection, • Operation and suppression of train protection systems, • Releasing of locking, • Timed clearing of signal aspects, and • Application of vital signalling timers.

**Interlocking Design
(Relay/Geographic)**

The purpose of this task is to provide signalling interlocking design or modification to the signalling system using Victorian Geographic principles.

To design the locking that prevents unsafe conditions that could lead to unsafe train movements. The interlocking uses status information from the trackside equipment (Signals, points/Other moveable infrastructure, Tracks and Train Protection) to ensure that any authorised train moves are compliant for the Signalling Principles.

The interlocking receives commands from the train control system and determines if it is safe to action the commands. If it is safe, the interlocking controls equipment to move points/other moveable infrastructure, train protection and signal aspects.

The task includes (but is not limited to):

- Locking of signalled routes,
- Locking of signal overlaps,
- Locking of signal approaches,
- Operation of railway crossing protection,
- Operation and suppression of train protection systems,
- Releasing of locking,
- Timed clearing of signal aspects, and
- Application of vital signalling timers.
- Clearing of Aspects
- Locking for Flank Protection.
- Swinging overlaps
- Slotting Request and Acceptance

**Interlocking Design
(Interface, Cross
Boundary and
Relay)**

The purpose of the Interlocking design is to implement the requirements of the Signalling Principles. The Interlocking is the system and conditions that prevent unsafe conditions that may lead to unsafe movement of trains. The Interlocking uses status information provided from trackside equipment (via Object Controllers) and commands from the Signalling Control and Indication System where the request is processed and if deemed safe, executed.

At areas where the area of control changes there is a requirement for Interlocking design to interact with different technology, principle and operational requirements.

Tasks include (but is not limited to):

- Locking of signalled routes across systems,
- Locking of signal overlaps across systems,
- Locking of signal approaches across systems,
- Operation of railway crossing protection across systems,

	• Operation and suppression of train protection systems across systems, • Releasing of locking across systems, • Timed clearing of signal aspects across systems, • Clearing of Aspects, • Locking for Flank Protection cross boundary, • Swinging overlaps, and • Slotting Request and Acceptance. Other consideration should include: • Failure modes of interface systems that are communicating vital functions over a communication bearer, • Timing consideration for cross boundary functions and impacts, and • The physical attributes of the existing or interfacing equipment. Note: The object controllers may be straight mapping of bits between the interlocking and the trackside equipment or may include some simple data that can be controlled locally. Object Controllers are considered part of the interlocking component and cannot operate without the interlocking. The interlocking/object controller can be mechanical, electro-mechanical or CBI. New and/or updated sites should be CBI.
Axle Counter Data Design	The purpose of this task is to configure the system data for axle counter installations in Victoria. Axle Counter Systems are certified as SIL 4 systems and provide confidence that the processing of the system reduces the chance of wrong side failure. This requires designers to be aware of the safety related application conditions and design within the parameters of the safety assessment. This requires a robust design/check/test process. The task includes (but is not limited to): • Identifying which head is assigned to which track, • Identifying which Axle Counter Evaluation Board is assigned to which head, • Defining which heads need to communicate with each other to form valid count in/count out, • Defining the conditions that needs to be met to reset the system, • Defining the reset methods within the system, • Defining which track sections can be used for automatic reset, • Defining counting head control requirements (if applicable), • Defining communication requirements between other systems, and • Defining interface file requirements between Axle counters and Interlocking (if applicable).

	Note: If two or more systems communicate with each other, the designer must ensure that the system configurations are aligned.
Bonding Plan (Train Detection, Signalling Apparatus and Bonding Plan)	The purpose of this task is to provide a geographical scaled drawing of the railway section showing the signalling apparatus, track circuit bonding and electrical networks interface components for traction return current. This plan also provides details relating to track mounted equipment positions in relation to datum point and track connections. The task includes (but is not limited to): • Insulated Rail Joints, • Electrical Separation Joints, • Axle Counter heads, • Tuning units, • Matching units, • Train stops, • Train Protection and Warning System, • Point machine, • Signals, • Platforms, • Crossings, • Signalling bonds, • Impedance bonds, • Tie in stations, • Substation, • Traction return rail, • Bonding configuration, • Transponders, • Equipment housings, and • Air gaps. Note: The exact chainage/meterage should be denoted for each piece of equipment. This plan is used by electrical teams to ensure that overhead structures are not within touch of signals, cross bonding positions enable sufficient traction return currents and the position of airgaps do not impact on signalling system. This development of this design should be an iterative process between signalling and electrical design to ensure that both systems can operate safely together. Signalling installation teams use this plan to install all signalling trackside equipment. Cable route designers use this assist with the positions of pits and under track crossings.

Object Controller Data Design (No Locking – using Application Logic Data Structure / Interface Control Document)

The purpose of the task is to design the data for the object controller.

The Object Controller acts as an interface between the Signalling Interlocking and the Trackside equipment.

Tasks include (but is not limited to):

- Allocation of I/O to align with trackside wiring
- Allocation of I/O to interface with other Object controller or Interlocking.
- Allocation of I/O to interface with Axle Counter systems
- Assigning Communication IP and Networking information
- Assigning system timers (LOC etc)
- System specific configuration settings
- Alarm creation

Power Calculations and Cable Running Plan

The purpose of this task is to provide power calculations for each individual signalling location / Relocatable Equipment Building / Room etc.

The power calculations should consider all signalling equipment which is powered from each busbar within the installation. As some signalling equipment only operates for a short period of time i.e., point drive, trainstop drive, the loads should be split into static and dynamic.

Where the busbar is being fed from a power supply or transformer, the losses within the unit should be accounted for. Allowance for future expansion should be provided by a nominal percentage figure.

The task includes (but is not limited to):

- Busbar name and voltage,
- Equipment being drawn from each,
- Expected load of each piece of equipment,
- Overall load on the 110V Transformer,
- Alternative power source loading requirements (generator),
- Size and recharging of Uninterruptable Power Supplies,
- Protection devices to discriminate faults, and
- Protection coordination - compatibility of settings over multiple protective devices.

The information from the power loading calculation is used with the information from the track circuit bonding and signalling apparatus plan to create a cable running plan. The Cable Running Plan shows the point-to-point installation of signalling communications and power cables with reference to signalling equipment and distances. This includes (but is not limited to):

	• Cable types to be installed between signalling locations based on functions or power requirements, • Cable types to be installed between signalling locations and trackside assets based on functions or power requirements, • Cable types to be installed between signalling locations and power stepdown transformer locations, • Cable identifier, and • The plan is used to determine the conduit requirements for the cable route design and the installation of cable by the installation (civil) team.
Railway Crossing Circuit Design (Using Typical Circuits)	The purpose of this task is to identify the circuit for activating level and pedestrian crossing and subsequently normalising. This task is generally local circuit with an interface to the interlocking for newer installations. The task includes (but is not limited to): • Power supplies and batteries for crossing protection equipment, • Timers to stage protection activation, • Indication circuits for status indication, • Traffic Light Coordination, • Condition monitoring system, • Fuse and termination analysis, • Cable and terminal analysis, • Relay contact analysis, and • Equipment housing /rack layouts.
Trackside Circuit Design (Using Typical Circuits)	The purpose of this task is to identify the connections and wiring relating to the operation of the trackside signalling equipment. The task includes (but is not limited to): • Power supplies and protection for equipment being powered within and external to the location, • Signal lighting circuit including junction box, • Train Detection circuits, • Point/moveable infrastructure control and detection: ○ Train Protection control and detection, and ○ Siding gates. • Network and communications equipment, • Object Controller system wiring, • Dip switch or jumper settings for all electronic systems, • Fuse and termination analysis, • Cable and terminal analysis, • Systems I/O analysis,

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- | | |
|--|---|
| | <ul style="list-style-type: none">• Relay contact analysis, and• Equipment housing/rack layouts. |
|--|---|

9. NATIONAL SIGNALLING TESTING SOC

National Statement of Competence for a – Please Select a Role

Testing & Commissioning		Proficiency
Test & Commission Strategy		Proficiency Level
Preparation of Testing Management Plan		Proficiency Level
Preparation of Commissioning Work Packages		Proficiency Level
Tester in Charge (Major Works)		Proficiency Level
Tester in Charge (Minor Works)		Proficiency Level
Principles Testing		Proficiency
Testing to Control Tables		Proficiency Level
Principle Testing (Simulator)		Proficiency Level
Principle Tester (Interface, Cross Boundary and Relay)		Proficiency Level
Axle Counter Data		Proficiency Level
Aspect Sequence Test		Proficiency Level
Function Testing		Proficiency
Circuit Function Test (Strap and Function Test)		Proficiency Level
Through Circuit Function Test (Correspondence Testing)		Proficiency Level
Verification Testing		Proficiency
Correlation Check		Proficiency Level
Apparatus Inspection		Proficiency Level
Wire Count, Insulation Test & Continuity Test		Proficiency Level
Wire Count & Null count		Proficiency Level
Proficiency Definitions		
P1 – A RIW Cardholder has limited knowledge obtained through either formal training or experience. The RIW Cardholder requires supervision in more complex tasks and activities to allow that person to gain relevant experience. May perform simple tasks unsupervised where previous experience can be demonstrated.		
P2 – A RIW Cardholder who has sufficient knowledge through either formal training and/or experience allowing to work unsupervised in tasks and activities within the relevant experience.		
RIW Cardholder		
Name:		RIW Number:
Signature:		Date:
Certification by Assessor:		
Name:		RIW Number:
Signature:		RIW Role:
		Date:

10. TASK DEFINITIONS – SIGNALLING TESTING

Tester in Charge	
Activity	Task Definition
T&C Strategy	System wide view of the delivery disciplines related to the Signalling System and an understanding of the interdependencies. The T&C Strategy (or part of a Delivery Methodology) should inform Signalling Design of how the system will be commissioned into service. This would include identifying significant interfaces and defining staged delivery boundaries.
Preparation of Testing Management Plan	A testing or Testing & Commissioning plan is required for all aspects of the Signalling System sub-systems and assets to ensure that the design requirements have been met, all equipment is installed and operational (to RTO specification), all sub-systems are integrated, and the system is safe to operate within the Railway System. The Preparation of the Testing Management Plans is detailed planning of a Testing or Testing & Commissioning Event with an understanding of: • Identify defined tasks and what V&V activities are required. • Identify interdependencies on the task for internal and external interfaces. • Resources require, competency requirements and tools required of each defined task. • Contingency planning in the event of foreseeable over run. The creator of the Testing Management Plan should be the person responsible for managing the day to day running of Testing activities and Commissioning events
Preparation of Commissioning Work Packages	A Commissioning Works Package is required for every Commissioning Event. This contains all the required information to Prepare, Implement and Evaluate the Signalling System readiness before being signed into service. This competence includes: • Understanding and decomposing technical information from the Testing Management Plan and creating packages of work for each V&V activity. • Programming tasks and time that consider all interdependencies that require to be completed prior to other tasks commencing. • Creating logs and registers required to track testing issues, design changes, progress, and issues. • Identifying key procedures required for the commissioning, key resource contact details, emergency management etc. • Allocation of tasks to teams and identify team resources. The creator of the Testing Management Plan should be the person responsible for managing the day to day running of Testing activities and Commissioning events.
Tester in Charge (Major Works)	The Major Works TiC shall be responsible for Organisation, control and completion of a commissioning event consisting of complex work usually over a longer period of time and can involve many departments and disciplines.

	A major works project may involve multiple staging and enabling works and a Major Works TiC is assigned to this role. Major works can also involve staging the signalling system back into operational use. Examples of major works may include: • An interlocking renewal, • A resignalling scheme, • Grade separation, or • A level crossing or active pedestrian crossing.
Tester in Charge (Minor Works)	The Minor Works TiC shall be responsible for Organisation, control and completion of a commissioning event consisting of minor works with limited complexity and interfaces. Minor works can vary in content from asset commissioning to small system commissioning. Work is generally carried out with minimal liaison with other departments, in minimal shifts and with one handback to the network. Examples of minor works may include: • Upgrades to existing infrastructure, • Additional equipment that does not require interlocking changes i.e., monitoring equipment and surge protection, • Enabling work for a major project, • Track support work, • A level crossing isolation, and • Disconnections/reconnections.
Principles Tester	
Signalling Tests	Task Definition
Test to Control Tables	Testing will be conducted to ensure that the installation conforms to the interlocking requirements detailed in the control tables. Detailed testing to control tables' verification procedures shall be based on local standards, guidelines and procedures of individual rail organisations. Note. This is not a principles test.
Principle Testing (Simulator) (AS 7716:2017)	To facilitate testing, a simulator or a test rig may be used to emulate the expected responses from external apparatus. Simulator testing may be used to assure the adequacy of the design for at all stages of testing including control table testing, principles testing, stress testing and testing computer-based systems. The benefits of this type of testing are that hardware and software can be interfaced with test inputs and outputs, but it does not allow for equipment reaction times, propagation times and the time for operation of points etc, in the external environment. These timing issues should be rechecked once the system is connected to the actual apparatus, to ensure there are no adverse timing effects. Simulator testing is often used where new interlockings or signal boxes are being installed. Function testing can be done in advance of final external inputs being available, using a simulation process. This process is used to simulate the operation of the external signalling equipment. Temporary inputs are

	used, usually via a test panel, to simulate field inputs. These simulated inputs provide correspondence of track indications, point indications, signal and route indications, trainstop indications, etc. The simulated inputs can be used to validate the new designs to ensure they will operate as per the approved design documents. The configuration and arrangement of the inputs should be approved by the design engineer and the RIM. Field inputs and indications should be used, when possible, to limit the amount of re-testing required when the final configuration change is made. The use of any temporary wiring shall be fully detailed on the approved design documents as stage work wiring. The installation, testing and removal shall be documented in testing copies of the stage work design provided for the site-specific requirements. Any function testing carried out by simulating the operation of the trackside apparatus shall be retested using the actual field equipment, including correspondence testing, to complete testing prior to commissioning.
Principle Tester (Interface, Cross Boundary and Relay) (AS 7716:2017)	Principles testing is undertaken independently of the issued control table details. Principles testing shall be carried out to validate that the controls embodied in the system conform to Signalling Principles, performance specifications and site-specific operating requirements and the railway layout signalling plan. Principles testing shall be planned and shall be developed based on the design intent. Principles testing shall include the following: • Inspection/Set to Work and Factory Acceptance Testing of Signalling Control System Panels and Screens, etc, • Validation of Signalling Scheme Plans, (SAPs, Hand Sketches etc.), including checking of signal spacing, clearance points etc, • Verification of Train Control Systems (diagrams, screens etc.) against the issued Signalling Scheme Plan, and • Testing of Axle Counter Resets and Failure Mode Protection (Aspect restrictions etc.).
Axle Counter data	Axle Counter data testing is undertaken on modern Axle Counter system where there are detailed configuration settings all interlinked into a subsystem independently of the Signalling Interlocking. The Axle Counter systems are generally SIL4 allowing creation and transfer of safety critical information i.e., block controls. The Axle Counter data testing shall: • Verify the Axle Counter configuration data as per design, • Verify the local configuration interaction between Axle Counter sections as per design, • Verify the Axle Counter communication between subsystem and between subsystem to Interlocking, and • Validate all Axle Counter resets scenarios i.e., supervisory, sweep, counting head control as part of the subsystem and Signalling System.

Aspect Sequence Test (AS 7716:2017)	Aspect sequence testing shall: • Verify that only the correct aspect and route indication are displayed to the driver of the train, • Be performed in accordance with the relevant signalling plans which provide details of potential routes through the area of track under test, and with any special aspect sequence charts drawn up specifically for the test, and • Ensure the complete aspect sequence is simultaneously observed in its entirety.
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Function Tester	
Signalling Tests	Task Definition
Circuit Function Test (AS 7716:2017) <i>(The same skill is applied to Strap and Function Tests and therefore Strap and Function does not require a separate SoC line item)</i>	Each individual circuit will be tested from its power supply fuse to its final controlled function. At every intermediate location, each link and relay function, will be verified as effective and circuit polarities are correct. Individual circuit functions, previously tested in the strap and function test, need not be repeated. After circuits, internal to locations and the external interconnecting cables, have been separately tested, tests will be carried out on the complete circuits. These tests will operate and verify the apparatus and the complete circuit from end to end, in a functional manner and will be carried out for both control and indication circuits: • Energise the circuit, to pick up the final controlled function and any intermediate relays connected to the same circuit, • At all the locations involved, disconnect and replace in turn, the feed fuse and every link in the circuit, including at the power supply busbar, observing that all relays in the circuit and all indications respond in each case, by correctly changing status, • For polarised circuits the test shall be carried out for each polarity, • Place a meter across the relay coils and verify correct working voltages, • Investigate any voltage when the circuit is opened, • For control and indication circuits, prove that each output corresponds with its relevant input. A function test of the system shall ensure that when there is a control operated at the control centre, it is correctly relayed throughout the system and operates the trackside apparatus, and when there is an indication from the trackside apparatus, that it is correctly relayed throughout the system to the control centre. Each indication shall be observed to change status in correct correspondence, and • Ensure contacts are in the correct configuration i.e., front or back, as per the design documentation.
Through Circuit Function Test (AS 7716:2017)	This is a circuit function test of a circuit or series of related circuits running between locations, e.g., signal boxes, relay room, etc., to ensure the fuses, links and control devices effectively control the final function. It includes through function testing from a signaller's control at the operator interface to

the operation of the trackside signalling apparatus, and to its change-of-state indication back to the signaller's indicator diagram.

Through circuit function testing will be carried out on circuits that operate between housing/locations to prove:

- The end function operates as intended through the complete circuit when the correct voltage and the correct polarity is applied to the originating part of the circuit,
- The circuit internal wiring has been correctly connected to the respective external cables where both have been separately continuity tested, wire counted, and insulation tested,
- De-energisation of, and zero residual voltage across the circuit function, when the circuit is opened, in turn, at, the fuse, each link and at each intermediate relay. The test is performed with as many other circuits energised as practical to provide a high probability of detecting the presence of any false voltages in the circuit, and
- All repeat, indicating and intermediate relays correspond and operate correctly, and train controllers panel indications respond correctly.

The processes used for through function testing should include the following:

- Energise the circuit to pick up the final control relay and any intermediate relays,
- At all the locations involved, disconnect and replace in turn the feed fuse and every link in the circuit, including at the power supply busbar, observing that all relays in the circuit and all indications respond in each case by correctly changing status,
- Verify the wire count at the fuse and on each side of disconnection links and record on the circuit diagrams,
- For polarised circuits the test shall be carried out for each polarity,
- Place a meter across the relay coils and observe correct working voltages. Investigate any non-zero voltage when the circuit is opened,
- Where circuits are in cascade (such as cut sections for AC traction immunisation or for volt-drop purposes) the intermediate relay circuits shall also be similarly tested, the final relay under test being observed to respond, and
- Where possible and relevant, carry out tests for each through circuit as a single operation from the point of control to the point of operation and from the point of operation to the point of indication.

Verification Tester	
Signalling Tests	Task Definition
Correlation Check (AS 7716:2017)	A Correlation Check is the manual process for physically checking to confirm that a circuit or part of it is wired in accordance with the available documentation. This must be done by hand tracing the wiring and wire-counting each termination point within the affected area. This check is to extend to one unaltered 'clean' relay contact or terminal on each side of the alteration. The correlation shall include a comprehensive check of all control equipment and it's labelling including equipment racks, cable terminations and apparatus cases. The check shall include all trackside equipment including signals, points and track circuit bonding likely to be affected by the proposed alterations. Correlation checking shall include the following: • Verify that each conductor runs directly between two wire termination points, • Wire count existing portions of the altered circuit/s sufficiently to verify that the design is a true representation of the actual circuits, and • Verify that there are no unused contacts/fuses/terminals shown to be in use in the circuit book analysis sheets that are without connected wires.
Apparatus Inspection (AS 7716:2017)	An apparatus inspection is a visual inspection to verify the signalling apparatus conforms to the approved and issued design documents, plans and standards specifications. Application specific requirements define the expected outcome based on local and site, RIM and manufacturer specifications and requirements. The inspection of signalling apparatus shall include the following: • Verify that configuration and positioning of trackside apparatus conforms to the latest approved design documentations, plans and standard specification, • Verify that installed apparatus items and cables are the correct type, quantity, rating, colour, labelling, with no loose wires and appropriate quality workmanship, • Verify that the apparatus mounting layout conforms to the profile drawings, • Verify that labelling is in accordance with plans and documentation, • Verify that signalling apparatus physically conforms to approved plans and signal sighting forms, • If the signalling apparatus is fitted with a security lock, verify that the correct security lock is fitted, and • Verify that extraneous items/apparatus are removed, that any loose wires are secured with ends insulated, that temporary wiring is removed, and that stage work is removed.

**Wire Count
(AS 7716:2017)**

The wire count shall be undertaken to ensure the installation wiring conforms to the approved design detail. Wire count is a visual inspection that examines the apparatus termination points to confirm that the number of wires on each termination point corresponds with the number of wires shown on the wiring diagram and/or design detail.

Wire count inspection shall include the following:

- Verify the number of conductors terminated at a particular point is as shown on the approved wiring diagram and/or design detail,
- The wire count shall include identification of all conductors connecting to terminals, busbars, links or other strapping. Rail mounted fuses should be closely checked to verify the presence or absence of common connections,
- Verify the wiring identification labels correctly identify the termination point of the wire,
- Check terminations and crimps are correctly made. Wires are not trapped under adjacent terminals, and crimps are correctly locked into plug boards or terminal blocks, and
- The tester on verifying that the correct number of wires is attached to each termination point shall mark the individual ends of each wire on the circuit plan and/or design detail in accordance with application specific approved standards.

**Insulation Test
(AS 7716:2017)**

The insulation testing of all wiring and apparatus associated with signalling installation shall be carried out prior to bringing into use in any new work with an approved insulation testing instrument with a voltage output in accordance with the requirements of AS 3000, Insulation resistance.

The test plan shall specify the minimum acceptance values of insulation resistance. Insulation tests shall be made on all lineside signalling cables, including local and power cables.

The test earth connection shall be tested immediately prior to performing this series of tests and immediately after the last test to ensure it provides a low resistance to earth.

Cable insulation tests shall be carried out with a proven effective reference earth. The integrity of the earth is essential for insulation resistance tests to be valid and earth leakage detectors to be effective.

Insulation testing is performed to determine the following:

- Insulation resistance to earth of electrical apparatus, wire conductors, cable cores and cable sheaths,
- Insulation resistance between cable cores, and
- Insulation resistance between each cable core and the cable sheath.

Insulation testing for individual wires will include the following:

- All individual wires run will be insulated resistance tested to the frame of the housing or rack,

	• It is desirable to test the complete circuit as a single test. Testing of a complete circuit, with all other circuits connected and working, has the added advantage of possibly detecting an insulation breakdown between circuits and not via earth, and • Prior to testing, all lightning protection devices and electronic devices will be disconnected or removed to prevent incorrect readings and/or damage.
Continuity Test (AS 7716:2017)	Continuity testing is used to confirm that a wire is connected, as per the design documentation. As part of the installation, a continuity test will be performed. A continuity test is a method to support assurance that the wire runs from point to point, forming part of an overall circuit and is terminated as per the circuit and/or design detail. A continuity test will be carried out before termination or with all links, fuses and apparatus removed, using an approved device that is capable of detecting a resistance greater than the cable resistance of the wire under test. The continuity tester will be a low voltage, preferably with an audible indicator, that shall sound when the test leads are connected across a continuous electrical path between termination points. The continuity tester will have its own independent power supply. A high resistance or open circuit between the terminated ends of the wire under test, shall prevent the alarm sounding. Where the wire cannot be terminated immediately it shall be checked as being present and ready for termination, suitably insulated and identified by a permanent label. Its subsequent termination will then be overseen by a tester who shall recheck to ensure that the number of wires terminated is in accordance with the circuit and/or wiring diagram. Continuity testing will include: • Ensure wiring is compliant with approved design detail and electrical continuity is verified, • A check will be made to ensure that all loose wire ends are suitably insulated, and • A check to verify that all labelling is correct as per the design detail.
Null Count (AS 7716:2017)	This is a visual inspection of all termination points against the documentation sheets to ensure there is no wiring surplus to that specified. The null count should be carried out after the continuity test and wire count has verified the wiring connecting to the respective terminals and marked up on the test copies. The documentation to be used will be the relevant completed analysis sheets that were checked / marked up from the documentation check. Null count inspection will include the following:

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| | <ul style="list-style-type: none">• Verify that there is no conductor connecting to terminals shown as spare in the contact/fuse/terminal analysis sheets in the circuit book, and• On the analysis sheets, mark the spare contact, fuse or terminal, with a tick to indicate the test is successfully completed. |
|--|--|

11. NATIONAL SIGNALLING TECHNICIAN/ELECTRICIAN SOC

National Statement of Competence for a – Please Select a Role

Testing and Certification	Install	Maintain	Track Circuits	Install	Maintain
Apparatus Function Test	Proficiency	Proficiency	Track Cct AC	Proficiency	Proficiency
Apparatus Inspection (Relay / Equipment / Wire Analysis / Server / Workstation / Telemetry)	Proficiency	Proficiency	Track Cct DC	Proficiency	Proficiency
Aspect Sequence Test	Proficiency	Proficiency	Track Cct GE Electrocode EC4	Proficiency	Proficiency
Bell Continuity Test	Proficiency	Proficiency	Track Cct GE Electrocode EC5	Proficiency	Proficiency
Circuit Function Test (incl Conduct Contact Proving)	Proficiency	Proficiency	Track Cct HVI	Proficiency	Proficiency
Circuit Strap and Function Test	Proficiency	Proficiency	Track Cct Siemens FS 2600	Proficiency	Proficiency
Contact Proving Test	Proficiency	Proficiency	Track Cct Siemens PSO 4000	Proficiency	Proficiency
Correlation Check	Proficiency	Proficiency	Track Cct Siemens PSO II	Proficiency	Proficiency
Documentation Check	Proficiency	Proficiency	Track Cct Siemens PSO III	Proficiency	Proficiency
Hand Trace	Proficiency	Proficiency	Track Cct Siemens SMTC	Proficiency	Proficiency
Insulation & Earth Leakage Tests	Proficiency	Proficiency	Track Cct UM71 / FS2500 / ML / ET200	Proficiency	Proficiency
Level Crossing Sighting and Focusing	Proficiency	Proficiency	CBTC Trackside Equipment	Proficiency	Proficiency
Mechanical Locking Test	Proficiency	Proficiency	Track Cct USS Microtrax	Proficiency	Proficiency
Null Count	Proficiency	Proficiency	Traction Bonding 1500v DC systems	Proficiency	Proficiency
Point Lock & Detection Test	Proficiency	Proficiency	Traction Bonding 25Kv AC systems	Proficiency	Proficiency
Points Correspondence Test	Proficiency	Proficiency	TPWS Trackside Equipment	Proficiency	Proficiency
Points Out Of Correspondence Test	Proficiency	Proficiency	Trainstop JA / JAH / JAV / JAE	Proficiency	Proficiency
Signal Sighting Test & Focusing	Proficiency	Proficiency	Wheel Sensor Treadle Man / Electronic	Proficiency	Proficiency
Test to Control Tables	Proficiency	Proficiency	TPWS On-board Equipment	Proficiency	Proficiency
Through Circuit Function Test	Proficiency	Proficiency	Control Systems - Sigview TVS	Proficiency	Proficiency

Through System Function Test	Proficiency	Proficiency	Interlocking	Install	Maintain
Wire Count	Proficiency	Proficiency	Interlocking Relay Q / AC shelf / AC plug-in	Proficiency	Proficiency
Level Crossing	Install	Maintain	Interlocking Route Set Q / AC plug-in	Proficiency	Proficiency
Level Crossing Equipment Pedestrian Crossing	Proficiency	Proficiency	Interlocking Siemens Westrace MK1 / Mk2	Proficiency	Proficiency
Level Crossing Equipment Road Crossing	Proficiency	Proficiency	Interlocking Microlok II	Proficiency	Proficiency
Level Crossing Monitor Broderon	Proficiency	Proficiency	Interlocking SSI Alstom Smartlock 400	Proficiency	Proficiency
Level Crossing Monitor Cerberus	Proficiency	Proficiency	Interlocking SSI Mk1/Mk2 /Mk3	Proficiency	Proficiency
Level Crossing Monitor Hima	Proficiency	Proficiency	Interlocking SSI Siemens Westlock	Proficiency	Proficiency
Level Crossing Monitor Sears	Proficiency	Proficiency	Interlocking Microlok II / HIMA / GRS VPI	Proficiency	Proficiency
Level Crossing Predictor XP-4	Proficiency	Proficiency	Interlocking Vital Shelf Relays	Proficiency	Proficiency
Level Crossing Sighting Test & Focusing	Proficiency	Proficiency	Interlocking VPI	Proficiency	Proficiency
Locate Signalling Services	Proficiency	Proficiency	Interlocking / ATP - Westect	Proficiency	Proficiency
LX System GCP 3000 / GCP 4000 / GCP 5000	Proficiency	Proficiency	Interlocking Hitachi WSP 1G/2G	Proficiency	Proficiency
LX System HXP 1 / HXP 3	Proficiency	Proficiency	Interlocking / RBC Hitachi WSP 1G / 2G	Proficiency	Proficiency
Points Machine	Install	Maintain	Interlocking Electric / Ordinary Train Staff	Proficiency	Proficiency
Point Mechanical	Proficiency	Proficiency	Interlocking Electro-Mechanical	Proficiency	Proficiency
Points Machine 84M / S700	Proficiency	Proficiency	Interlocking GE ElectrologIXS	Proficiency	Proficiency
Points Machine GEC HW2000 / 4121 / 4400	Proficiency	Proficiency	Interlocking Harmon VHLC	Proficiency	Proficiency
Points Machine M2 / M3A / M23A / M70 / SureLock	Proficiency	Proficiency	Interlocking HIMA	Proficiency	Proficiency
Points Machine Nippon 302A / 1200 / 1211 / 1401	Proficiency	Proficiency	Mechanical Interlocking Ground Frames <=8 Levers	Proficiency	Proficiency
Points Machine Vossloh MCEM91	Proficiency	Proficiency	Mechanical Interlocking Main Frames > 8 Levers	Proficiency	Proficiency
Points Machine Vostalpine Unistar HR	Proficiency	Proficiency	Control Systems and ATP Systems	Install	Maintain
Points Mechanical Bolt FPL / Eco Mment FPL	Proficiency	Proficiency	Control Systems Hard Wired Non-Vital Systems	Proficiency	Proficiency

Points System Electro Pneumatic SB / ES / A / S / T	Proficiency	Proficiency	Control Systems Hitachi TMS	Proficiency	Proficiency
Points System SPX ClampLock Mk1 / Mk2 / Mk3	Proficiency	Proficiency	Control Systems VICOS	Proficiency	Proficiency
Railhead Locking - Claw / Spherolock / Clamp Lock	Proficiency	Proficiency	Elec Release SB / W'house / HLM	Proficiency	Proficiency
Others	Install	Maintain	Electrical Release	Proficiency	Proficiency
Power Supply, Power Supply Isolation	Proficiency	Proficiency	ATP Trackside Equipment / Balise data install	Proficiency	Proficiency
Power Supply Polarity Test & Phase Test	Proficiency	Proficiency	ETCS L1 Server / Workstation Equipment	Proficiency	Proficiency
ATMS Trackside TIU	Proficiency	Proficiency	ETCS L1 Trackside Equipment	Proficiency	Proficiency
AWS Trackside Equipment	Proficiency	Proficiency	ETCS L2 Server / Workstation Equipment	Proficiency	Proficiency
Axle Counter Bombardier EBI2000	Proficiency	Proficiency	ETCS L2 Trackside Equipment	Proficiency	Proficiency
Axle Counter Frauscher FAdC / ACS2000	Proficiency	Proficiency	ETCS Server / Workstation Equipment	Proficiency	Proficiency
Axle Counter Siemens ACM100 / ACM200 / ACM250	Proficiency	Proficiency	Control Systems - Westcad / Westrol	Proficiency	Proficiency
Axle Counter Siemens AzS350 / AzS600	Proficiency	Proficiency	Control Systems - ATRICS	Proficiency	Proficiency
Axle Counter Thales AzLM / AzLS	Proficiency	Proficiency	Control Systems - Phoenix	Proficiency	Proficiency
CBTC On-board Equipment	Proficiency	Proficiency	Control Systems - UTC	Proficiency	Proficiency
CBTC Server / workstation Equipment	Proficiency	Proficiency	Signals	Install	Maintain
Comms iMAC	Proficiency	Proficiency	Signal Sighting and focusing	Proficiency	Proficiency
Comms Kingfisher	Proficiency	Proficiency	Signal / Indicator Lamp / LED / Fibre Optic	Proficiency	Proficiency
Comms Microlok Vital Radio	Proficiency	Proficiency	Signal / Indicator Mechanical	Proficiency	Proficiency
Comms Moscad	Proficiency	Proficiency			
Comms Rugged Com RS400 family / RS910	Proficiency	Proficiency			
Comms Westinghouse S2	Proficiency	Proficiency			
Comms SCADA 2000 / Dupline / IMAC / Kingfisher	Proficiency	Proficiency			
Comms Westermo MRD family	Proficiency	Proficiency			

Proficiency Definitions	
N – Not yet competent or exposed – this level can be used to populate the SoC for the RIW Cardholder's awareness but does not require assessment to use this proficiency level.	
P1 – A RIW Cardholder has limited knowledge obtained through either formal training or experience. The RIW Cardholder <u>requires supervision</u> in more complex tasks and activities to allow that person to gain relevant experience. May perform simple tasks unsupervised where previous experience can be demonstrated.	
P2 – A RIW Cardholder who has sufficient knowledge through either formal training and/or experience allowing to work unsupervised in tasks and activities within the relevant experience.	
RIW Cardholder	
Name:	RIW Number:
Signature:	Date:
Certification by Assessor:	
Name:	RIW Number:
Signature:	RIW Role:
	Date:

12. NATIONAL SIGNALLING LOGBOOK

RIW Cardholder Name:

RIW Number:

Page No.

WITNESS STATUS LIST

By signing the Witness Status List and countersigning the Work Experience Record entries, the RIW Cardholder's Workplace Supervisor is confirming activities as documented are a true reflection of the work completed by the RIW Cardholder and attested proficiency level. Workplace Supervisors may be held responsible for any inaccuracies in this process. All Workplace Supervisors countersigning Work Experience Record entries shall provide their details in the table below.

Ref	Name	Organisation	RIW Role	RIW Number	Signature	Initials	Date
1							
2							
3							
4							
5							
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RECORD OF WORK EXPERIENCE

Guidance Notes for Completing Record of Work Experience

1. RIW Cardholder's should populate the work experience fields below, including dates, client and description of the task. Description should include your role, proficiency, degree of supervision, complexity of task and general comments supporting the task plus any specific equipment or system types worked on.
2. Prior to verification signature, RIW Cardholder's should also cross reference the task to the SoC Task Reference making it easier for the Workgroup Supervisor and Assessor to identify the task evidence required of the SoC.
3. It is recommended that the Work Experience Record is updated on a monthly basis, no longer than 3 months and at the end of project work.

Dates from / to	Client: Employer, Contractor in Charge, Joint Venture, Project and/or Network Operator	Description of Task: In terms of your role, proficiency, degree of supervision, complexity of task and general comments	SoC Task Reference	Equipment or System Types	Verification Signature and ID Reference from the Witness Status List	Workplace Supervisor Observations (Assessment / Follow-up / Reassessment)

CONTINUAL PROFESSIONAL DEVELOPMENT

Guidance Notes for Continual Professional Development

1. RIW Cardholder's should enter the date/dates of the activity and briefly indicate the learning outcome. For example, when attending a seminar, the learning outcome may be the application of new technology to signalling equipment. RIW Cardholder's should also list any in-house, external or accredited courses and where applicable, list the SoC Task reference.

Date	Activity	SoC Task Reference (if applicable)	Verification Signature, Name and ID Ref. from the Witness Status List

LOGBOOK REVIEW

Guidance Notes for Completing Logbook Review

- As stated in Section 3.9 of the National Signalling Assessment Framework, Logbook Reviews shall be completed:
 - Annually by the RIW Cardholder's Workplace Supervisor,
 - Prior to the job role being submitted for assessment, indicating the Logbook and the self-assessed SoC are ready for assessment, and
 - When the Logbook is reviewed by the Assessor.
- The reviewer must provide sufficient detail as to why any sections have or have not been met. RIW Cardholder's should enter the date/dates of the activity and briefly indicate the learning outcome. For example, when attending a seminar, the learning outcome may be the application of new technology to signalling equipment. RIW Cardholder's should also list any in-house, external or accredited courses and where applicable, list the SoC Task reference.

Date	Logbook Section	Section requirements met		Action Points	Date to be completed	Verification Signature, Name and ID Ref. from the Witness Status List
		Y/N	Reviewer to describe how the section requirements have /have not been met			
	Witness Status List					
	Record of Work Experience					
	Continual Professional Development					

13. NATIONAL SIGNALLING ASSESSOR APPLICATION FORM

This Application form shall be completed by all RIW Cardholders wishing to carry out National Signalling Design and/or Testing assessments in support of the RIW Program.

Section A: Applicants Details

First Name		Surname	
Address		RIW Number	
Mobile		Email	
In signing this form, I agree to: 1. Comply with the requirements of the NSAF and allow my details (name, mobile, email address and what roles I can assess) to be available on the RIW Website for prospective RIW Cardholders/RIW Employer Administrators to contact me prior to submitting their job role for assessment; 2. Keep confidential all information obtained in the process of NSAF assessing activities and not to disclose this information to any third party without the prior written consent of MTA, except where the law requires such information to be disclosed and MTA has been informed beforehand of what information is required to be disclosed; 3. Always act in the best interests of MTA, the ARA and their stakeholders, and in accordance with the law; 4. Not permit your own personal interests or those of your employer / client to influence your behaviour; 5. Where there is a conflict of interest between your appointment and your other business activities or interests, inform MTA of the circumstances; and 6. Undertake all work in your National Signalling Assessor role impartially and not be influenced by the promise of favours, financial reward or fear of consequences in making any decision regarding your assessment outcome.			
Applicant Signature		Date	Click or tap to enter a date.

Section B: National Signalling Roles

Applicants shall select all signalling job roles they wish to assess.

Signalling Designer	☐
Signalling Principles Designer	☐
Signalling Verification Tester	☐
Signalling Function Tester	☐
Signalling Principles Tester	☐
Signalling Tester in Charge	☐

Section C: Knowledge and Experience

The NSAF requires assessors to be vocational competent in the activity being assessed.

This section shall only be completed by Applicants wishing to demonstrate vocational competence via their Network Operator employment, as opposed to holding a valid National – Signalling job role.

Applicants are to list the relevant Statement of Competence (SoC) line item and provide a statement supporting their knowledge and experience. (Additional rows to be added as required)

[illegible]

Section D: Network Operator Sponsorship

Applicants must be sponsored by a Head of Engineering – Signalling (or equivalent) representative from the Network Operator where their signalling knowledge and experience can be substantiated. Applicants who have knowledge and experience from a variety of Network Operators are only required to select one.

Note. Applications will be rejected without sponsorship.

Network Operator		Sponsor First Name	
Sponsor Position		Sponsor Surname	
Mobile		Email	
In signing this form, I confirm the applicant has the relevant proficiency to conduct assessments on the nominated National Signalling job roles.			
Applicant Signature		Date	Click or tap to enter a date.