UEE41223 - Certificate IV in Rail Signalling

Competency Australia Pty Ltd

Learner Handbook

Competency Australia Pty Ltd

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Competency Australia

Contents

1.   INTRODUCTION

1.1   ABOUT THE COURSE

1.1.1   Duration

The qualification is delivered over eleven (11) 5-day blocks, over 24 months. There is also an online induction session which is completed remotely prior to attending the face-to-face sessions.

For groups undertaking a private course, the course schedule can be arranged to suit specific client requirements, dependent on resource availability and suitability of training durations.

1.1.2   Entry Requirements

Applicants are required to:

- Be employed in a rail signalling trainee or apprentice role with access to live signalling equipment and
- Have relevant prior general railway industry experience and exposure, including at least 6 months experience in a signalling or related role and
- Be enrolled in Certificate III Electrotechnology – Electrician, having completed at least one third of the total weighting points of this course OR
- Hold a Certificate III in Electrotechnology Electrician OR a current unrestricted electrical licence in any Australian state or territory.

There is also a pathway available for those with a Certificate III in Electrical Fitting under certain circumstances. Please contact us to discuss further if this applies to you.

Applicants must be currently employed in a signalling maintenance role within the rail industry. This is to ensure that students have relevant on-the-job experience to re-enforce and embed their formal learning experiences. Activities within the workplace form part of the course assessment.

It is also expected that students will have prior experience within the rail industry, including completion of basic training courses such as TLIF2080 – Safely access the rail corridor. A general familiarity with the railway environment, railway assets and operations is required when commencing this training program.

1.1.3   Who Should Enrol?

This qualification provides the skills and knowledge required to become a signal electrician/technician working in the railway industry.

The course is available to those undertaking apprenticeship programs as well as electricians/technicians wishing to up-skill or formalise their knowledge and experience with a nationally recognised qualification.

This course is only suitable for those who have current employment in the signalling industry. Throughout the course, you will be required to conduct workplace activities, which require access to signalling equipment outside of the training environment.

1.1.4   Location

Our head office is located in Maryville, NSW.

Due to the highly practical nature of the course, there are limited venues available for delivery.

The following venues are currently available:

- Competency Australia – Unit 4, 28 Portside Crescent, Maryville NSW 2293 (Public & Private courses)
- Newport Rail Academy – Shea Street, Newport, VIC (Private courses only)

1.1.5 Course Format

The course is delivered through face-to-face training, and includes a mixture of classroom, practical and workplace activities.

The course consists of 15 modules, ranging in duration from one (1) day to five (5) days. Assessment consists of regular theory and simulated practical activities, as well as final practical assessments and a final written test.

1.2 PROVISION OF TOOLS & PPE

There is a strong practical component of this course, and you will be performing installation, maintenance, testing and fault finding activities as part of the formal training sessions.

Any concerns or issues with providing equipment must be highlighted as soon as possible.

Competency Australia provide tools, consumables and test equipment for student use while undertaking formal training and assessment activities in our Newcastle training centre.

Students are required to provide their own PPE.

You will be advised of the specific PPE requirements prior to each session.

You are required to wear appropriate PPE to all sessions.

1.3 MENTORING

We recommend that all students have the support of a qualified and experienced signal electrician/technician. This qualified person provides a mentoring role, and additional workplace support throughout the course duration. The course trainers will liaise with this mentor as required.

1.4 ASSESSMENT

1.4.1 Assessment Activities

You will be provided with a set of course notes for each module.

The following assessment activities are completed during the 5-day blocks of training:

- Workbook activities, completed in class during face to face training sessions
- Closed book written assessments (tests)
- Practical (simulated) assessments.

1.4.2 Take Home Assignments

As part of some of the learning modules, you will be issued with a set of activities to perform prior to the next training session. These submissions will be reviewed and formally assessed by Competency Australia, and will contribute directly to your overall assessment for that module.

1.4.3   Supervised Workplace Activities

All students will be required to provide evidence of working in the signalling industry over the duration of the course.

At the commencement of the course, students will be issued with a list of activities that must be completed prior to completion of the qualification.

These activities are generic in nature, for example 'Maintain train detection equipment'.

For each of the activities, a supervisor observation sheet is completed and submitted to Competency Australia.

1.4.4   Re-assessment

Should performance during an assessment be deemed not yet satisfactory, you will have two (2) opportunities for re-assessment. If unsuccessful after two (2) attempts, you will be required to attend the full training module/s again.

Should additional training and assessment be required, additional course fees will be charged. The student and/or employer will be advised of any such fees prior to any charges being made.

1.4.5   Complaints and Appeals

If you have any concerns or questions about the assessment process, we recommend that you approach your trainer in the first instance. You can also contact the course coordinator Jeanette@CompetencyAustralia.com.au with any concerns.

A complaints and appeals form is also available through the course website http://CompetencyAustralia.edu.au.

If a satisfactory outcome cannot be reached internally, an independent third party may be appointed to arbitrate and reassess if necessary.

If no satisfactory solution is reached, students can lodge a complaint with the Australian Skills Quality Authority (ASQA). Further details can be obtained at Making a complaint | Australian Skills Quality Authority or by telephoning the ASQA Info Line on 1300 701 801 or by emailing enquiries@asqa.gov.au

Please see our Complaints Policy, available for download from our website, for further information.

2. CONTENT

2.1 CORE UNITS

The following core units are delivered as part of the qualification:

Unit Code	Title
UEECD0024	Implement and monitor energy sector WHS policies and procedures
UEECD0027	Participate in development and follow a personal competency development plan
UEERE0015	Implement and monitor energy sector environmental and sustainable policies and procedures
UEERS0020	Apply rail signalling principles
UEERS0021	Assemble and wire electrical rail signalling equipment
UEERS0022	Find and repair rail signalling system fault
UEERS0024	Install and maintain rail track circuit leads and bond
UEERS0025	Maintain active level crossing equipment
UEERS0030	Maintain power-operated point actuating devices
UEERS0031	Maintain rail signalling power supplies
UEERS0032	Maintain trackside signal and train protection equipment
UEERS0033	Maintain train detection equipment
UEERS0037	Test copper rail signalling cables

2.2 ELECTIVE UNITS

The following elective units are delivered as part of our standard program.

Unit Code	Title
UEERS0027	Maintain computer-based interlocking rail systems
UEERS0034	Maintain vital relay interlocking systems
UEERS0029	Maintain non-vital telemetry systems

Alternative electives may be provided based on enterprise needs, provided that the requirements of the training package are still met.

2.3   SCHEDULE OVERVIEW

Block Number	Module Number	Topics Covered
-	Module 1	Course Induction, including work health and safety policies and procedures, environmental and sustainable policies and procedures and introduction to personal competency development.
1	Module 2	Signalling Principles
	Module 3	Track Leads and Bonds
	Module 4	Copper cable testing
2	Module 5	Installation and Wiring
	Module 6	Maintain and Fault Find Power Supplies
3	Module 7	Maintain Jointed Track Circuits
4	Module 8	Maintain Electric Points
5	Module 9	Maintain Signals and Train Protection Equipment
6	Module 10	Maintain Level Crossings
7	Module 11	Maintain Jointless Train Detection Systems
	Module 12	Maintain Non-vital Telemetry
8	Module 13	Maintain Relay Interlockings
9	Module 14	Computer based Interlockings Fault finding
10	Module 15	Signal Safeworking (ST144)
11	N/A	Final Assessment week. Practical and written assessments.

2.4   MODULE DESCRIPTIONS

Module 1

The first module provides an introduction to the course, including the course format and expectations. We will discuss work health and safety in the context of the electro-technology industry, along with environmental and sustainability issues relevant to rail signalling work.

Module 2

Module 2 provides an introduction to the fundamental principles of signalling. This unit is focused on mechanical signalling in order to provide a good understanding of the fundamentals on which modern day systems are built.

Module 3

Module 3 is a short module covering the installation and maintenance of track leads and bonds. You will learn how to interpret signalling and bonding plans and install leads and bonds in accordance with plans.

Module 4

Module 4 is focused on the testing of copper cables. You will learn how to test cables, terminate cables as well as find cable faults.

Module 5

During this module, you will be learning and applying basic installation techniques. We introduce standard circuit diagrams and drawings, including symbols and nomenclature. As part of this module you will be working together to wire and install signalling equipment.

Module 6

This module is all about power supplies. There are practical demonstrations and activities in the classroom, to help you understand the components that make up power supplies. You will be installing and maintaining some of the types of power supplies commonly used in the rail industry.

Module 7

In this first train detection module, jointed track circuits are covered in detail. This includes DC, AC, High Voltage Impulse, coded and diode tracks. You will learn about components, operating mechanisms and associated signalling principles. We cover installation and maintenance techniques as well as basic fault-finding.

Module 8

This module is focused on point machines, including the fundamentals of locking and detection systems. We will study some of the commonly used point machines in detail, both in the context of maintenance. Points control circuitry is covered in detail.

Module 9

Module 9 covers the installation and maintenance of signals and train protection equipment. Principles covered include headway, signal sighting, along with protection systems such as Automatic Warning Systems (AWS) Train Protection and Warning Systems (TPWS) and Automatic Train Protection (ATP).

Module 10

During the classroom sessions we will be learning about different types of level crossings and their controls, including the principles of approach tracks, island tracks, timing and operation. Practical activities include level crossing maintenance and adjustments.

Module 11

In this second train detection module, audio frequency track circuits are studied, including both analog and digital models. Axle counter systems are also covered. Practical activities include set to work, maintenance and fault finding.

Module 12

Non-vital telemetry systems are studied in Module 12. The training includes maintaining and testing this equipment as well as transmission protocols and diagnostic fault finding techniques.

Module 13

In Module 13 relay interlockings are studied. This includes standard circuits, controls, maintenance and change over procedures.

Module 14

Module 14 builds further on interlocking knowledge and modern applications such as solid state interlockings and computer based interlockings. You will study a number of different equipment types.

Following the computer based interlocking training, the testing and fault-finding knowledge and skills that have been developed through the previous modules will be brought together with practical exercises. You will learn a systematic approach to fault finding. You will determine the cause of various faults that will have been placed in the signalling system used for training.

Module 15

The final module of the qualification is signal safeworking. During this module, you will learn about ARTC's network rules and procedures related to signal safeworking. The application of specific signalling standards will be studied in depth, including the booking out and disconnection of signalling infrastructure, applying temporary bridging and re-railing practices. This module has a strong focus on the management of wrong side failure investigations, incidents and accidents.

Final Assessment Week

During this week, students will undertake a number of individual practical assessments. At the conclusion of the week, a final written assessment will be completed.

2.5   PRE-REQUISITES

Before we can issue you with your qualification, we require evidence that you have completed the Certificate III in Electrotechnology Electrician, or hold a current 'Unrestricted Electricians Licence' issued in an Australian state or territory.

3. ADDITIONAL INFORMATION

3.1 QUALIFICATION ISSUANCE

On successful completion of all activities, your qualification will be issued.

Qualifications will be issued within 14 days of confirmation of successful completion.

Qualifications and testamurs will be mailed in hard copy only, a soft copy of the certificate will not be provided.

If your contact details have changed during the session, please advise the course coordinator.

A fee of $25 will be charged for each replacement certificate required.

3.2 PAYMENT

3.2.1 Individual Learners

A non-refundable initial deposit and administration fee is required to confirm enrolment.

The remainder of the course fee will be invoiced in equal instalments, payable at the conclusion of each training/assessment block.

We accept the following payment methods:

- Direct deposit (preferred)
- Credit card (via Paypal, additional fees apply).

3.2.2 Employers

Where an employer engages Competency Australia to provide training and/or assessment, payment shall be as per arrangement.

3.3 REFUNDS

Due to the small class sizes and high demand for this course, we request that you please advise of your intention to discontinue your enrolment in writing as soon as possible.

Any cancellations prior to commencement will result in forfeiture of the course deposit fee.

Please see our Refund and Cancellation Policy, available for download from our website, for further information.

3.4 CANCELLATION

If for any reason Competency Australia is unable to meet its service agreement to a student, we will provide a full refund. Alternatively, we will be happy to arrange to place you on the next convenient course available.

3.5 REASONABLE ADJUSTMENT

Wherever possible, we will make reasonable adjustments to meet your individual needs. Any special needs, including physical, learning or health conditions which may require

adjustments to be made should be advised as part of or prior to the enrolment process. Appropriate adjustments will then be discussed.

3.6   ACCESS & EQUITY

Competency Australia is committed to integrating access and equity principles within all the services that we provide to our clients. All staff recognise the rights of learners and provide information, advice and support.

Regardless of cultural background, religion, gender, sexuality, disability, location or age you have the right to learn in an environment that is free from discrimination and harassment and be treated in a fair and considerate manner while you are studying with us.

3.7   DISCRIMINATION

We will not tolerate any unlawful discrimination or harassment based on sex, pregnancy, marital status, race (including colour, ethnic background, national identity and ethno-religion), sexuality, disability or age, etc.

Harassment includes any form of behaviour that a person does not want, finds offensive, humiliating or intimidating.

3.8   BEHAVIOUR

Clients are expected to behave appropriately and in a mature and professional manner at all times. All clients are expected to take responsibility for their own learning and behaviour during training and assessment. Misconduct will not be tolerated.

Misconduct includes

- Any offensive conduct or unlawful activity (e.g. theft, fraud, violence, assault);
- Interfering with another person's property;
- Removing, damaging or mistreating Competency Australia property or equipment;
- Cheating/plagiarism;
- Interfering with another person's ability to learn through disruptions during training;
- Breach of confidentiality;
- Inappropriate language;
- Serious negligence, including WHS non-compliance;
- Discrimination, harassment, intimidation or victimisation;
- Being affected by drugs, alcohol or fatigue or otherwise being unfit to participate in learning activities.

Competency Australia is a drug and alcohol free training facility. Students are expected to comply with our drug and alcohol policy, including undergoing drug and alcohol testing.

3.8.1   *Respect for Others*

Competency Australia retains the right at all times to remove disruptive clients from the training environment.

- You will be expected to treat staff and fellow clients with respect and observe any client etiquette requirements that appear in the student handbook or are requested during the course by a trainer/assessor.

- Inappropriate language and actions will not be tolerated.
- Harassment, bullying and intimidation of staff or fellow learners will not be tolerated.
- Treat facilities and equipment with due care and respect.
- You are required to respect the rights of others and treat others in a manner which is fair and non-discriminatory.

3.9 LEGISLATIVE REQUIREMENTS

Competency Australia is committed to ensuring compliance with all legislative requirements of State and Federal Government.

3.10 MANAGEMENT & ADMINISTRATION

Student records are managed securely and confidentially and are available for student perusal on request.

3.11 PRIVACY

Competency Australia strongly supports the privacy and confidentiality of students' information and this is supported though compliance with the Privacy Act 1988 and the Student Identifiers Act 2014. Certain information regarding geographic location, gender, age and results are required for statistic requirements by Government bodies.

3.12 RECOGNITION OF PRIOR LEARNING (RPL)

Recognition of prior learning assessment is available to all learners. If you believe you have relevant current skills and abilities that you have gained previously, please contact your course coordinator.

They will discuss the evidence requirements and documentation required to support your application.

3.13 MUTUAL RECOGNITION

Competency Australia recognises AQF Qualifications and Statements of Attainment issued by other Registered Training Organisations.

3.14 ASSESSMENT

Assessment Malpractice

Assessment malpractice includes: cheating, collusion and plagiarism.

Competency Australia regards the integrity of assessment as critical to its professional responsibilities as an RTO and therefore strives to ensure the assessment processes are not compromised. Competency Australia has policies and procedures in place for dealing with assessment malpractice. Cheating or the use of another person's work and submitting as your own will not be tolerated.

Collusion is the presentation of work, which is the result in whole or in part of **unauthorised** collaboration with another person or persons. It is your responsibility to ensure that other clients do not have opportunity to copy your work.

Copying from a published work (including the internet), without referencing, will not be tolerated. This includes presentation of work which has been copied in whole or in part from another person's work or from any other source such as the Internet, published books, and periodicals. This includes systematic re-wording or changing key nouns and verbs. **You must follow referencing guidelines if you take another person's idea, and put it into your own words.**

3.15 CHANGE OF PERSONAL DETAILS

Clients are required to ensure their personal details recorded with Competency Australia are up-to-date at all times. Should your circumstances or details change please advise us via email.

3.16 EVALUATION AND FEEDBACK

Competency Australia values all feedback from clients as it assists us to continuously improve the products and services we offer. Clients are encouraged to provide us with feedback, both positive and constructive.

Thank you in advance for your comments.

3.17 UNIQUE STUDENT IDENTIFIERS (USI)

The Unique Student Identifier or USI is a reference code made up of 10 numbers and letters that:

- creates a secure online record of your recognised training and qualifications gained in Australia, even from different training organisations
- will give you access to your training records and transcripts
- can be accessed online, anytime and anywhere
- is free and easy to create and
- stays with you for life

Your USI will give you access to an online record of the training you have done since 1 January 2015.

You are now able to produce a comprehensive transcript of your training. This can be used when applying for a job, seeking a credit transfer or demonstrating pre-requisites when undertaking further training.

You must provide your Unique Student Identifier (USI) before we can issue you with a statement of attainment or qualification. This USI is verified using your personal details (name and birth date) to ensure the details provided are correct.

If you are unsure whether you have a USI, or you have forgotten it, please talk to your trainer/assessor or visit https://www.usi.gov.au/

3.18 LANGUAGE, LITERACY AND NUMERACY

Each unit of competency has specific requirements with regard to the language, literacy and numeracy skills required to successfully complete the course. There is a national

framework with 5 levels of competence related to complexity of language, literacy and numeracy.

For the majority of the units within the Certificate IV qualification, these requirements are : Reading – 4, Writing – 4 and Numeracy - 4

What do these levels mean? The following definitions are taken directly from UEE11 Electrotechnology Training Package Release 1.5, p 797, 799, 800, 802 & 803.

3.18.1   Reading Scale 4

Indicators of Competence	Technical Communication
Reads and interprets structurally intricate texts in chosen fields of knowledge which require integration of several pieces of information for generating meaning	Compares and contrasts views on technology in newspaper articles.
	Interprets the purposes and objectives for the use of technology after the reading a brochure or manual.
Interprets texts, which include ambiguity, and inexplicitness where reader needs to distinguish fact from opinion and infer purpose	Selects technological practices to conform to the guidelines for health and safety, environmental impact and ethical practice, and uses them within those guidelines.
	Uses guidelines to ensure technological equipment is used to its full capacity.
	Uses a computer to prepare a typed report from a hand-draft report.
Interprets and extrapolates from texts containing data which includes some abstraction, symbolism and technicality presented in graphic, diagrammatic, formatted or visual form.	Compares and contrasts different technologies and their impact, eg argues the case for new practices when using new technologies, reports on the effects of installation of new machinery.
	Writes a report on the impact of a particular technology for a specific audience, eg management committees, tri-partite committees.
	Reads a complex diagram to identify components and procedures for dealing with technical fault or breakdown.

3.18.2   Writing Scale 4

Indicators of Competence	Technical Communication
Communicates complex relationships between ideas by matching style of writing to purpose and audience.	Compares and contrasts views on technology in newspaper articles.
	Interprets the purposes and objectives for the use of technology after reading a brochure or manual.
Generates written texts reflecting a range of genres and using appropriate structure and layout.	Selects technological practices to conform to the guidelines for health and safety, environmental impact and ethical practice, and uses them within those guidelines.
	Uses guidelines to ensure technological equipment is used to its full capacity.

	Uses a computer to prepare a typed report from a hand-drafted report.
	Compares and contrasts different technologies and their impact, eg argues the case for new practices when using new technologies, reports on the effects of installation of new machinery.
	Writes a report on the impact of a particular technology for a specific audience eg management committees, tri-partite committees
	Reads a complex diagram to identify components and procedures for dealing with a technical fault or breakdown.

3.18.3   Numeracy Scale 4

Indicators of Competence	Technical Communication
Selects and investigates appropriate mathematical information and relationships embedded in an activity, item or text.	Uses ratio and scale to interpret dimensions on a basic plan.
	Applies similarity and ratio to estimate and calculate lengths
Selects and applies an expanding range of mathematical strategies flexibly to solve problems in a variety of contexts	Compares quality and costs eg of using imported vs Australian tiles, discount vs brand name paints
	Presents information in appropriate graphical format to show different interpretation and influences
Examines and questions the appropriateness, possible interpretations and implications of aspects of a mathematical activity	Applies formulae and interprets results relevant to a familiar practical situation, measuring the dimensions needed and substituting them into the formula, adjusting units where necessary
	Uses area and perimeter to calculate a range of options eg given a certain length of fencing, plan a range of options of paddock dimensions, which meet specific area requirements.
Uses a range of oral and written informal and formal language and representation including symbols, diagrams and charts to communicate mathematically	Calculates and contrasts monthly income from average sales, given a variety of salary options involving retainers and commission rates.