



Australian Government

Department of Education, Employment and Workplace Relations

TLIS3011A Test rail using nondestructive testing equipment

Release: 1

TLIS3011A Test rail using nondestructive testing equipment

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor

This unit involves the skills and knowledge required to test switches, crossings and other special components in turnouts using ultrasonic and other nondestructive testing equipment in accordance with approved standards, safeworking and regulatory requirements and workplace procedures. It includes determining test requirements, conducting ultrasonic testing using hand directed equipment, conducting nondestructive testing, classifying defects, and completing all required documentation. Licensing or certification requirements are not applicable to this unit.

Application of the Unit

Application of the Unit

Persons achieving competence in this unit will need to fulfil the applicable legislated rail safety requirements including acts and regulations from each state and territory together with any nationally approved compliance codes and/or guidelines.

Work is performed under some supervision, generally within a team environment. It involves the application of routine operational principles and procedures to testing turnouts using nondestructive testing equipment as part of workplace activities across a variety of operational contexts within the Australian rail system.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

Employability Skills Information

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Determine test requirements	1.1 Location and type of test is identified 1.2 Test site is prepared using appropriate procedures and materials 1.3 Preparation processes are carried out in accordance with the relevant procedures, statutory and OH&S requirements
2 Conduct ultrasonic testing using hand directed equipment	2.1 The most appropriate ultrasonic test for the application is selected 2.2 Testing equipment is selected and prepared in accordance with standards and/or procedures 2.3 Ultrasonic testing equipment is checked for proper function, maintained and stored in accordance with procedures, OH&S requirements and manufacturer instructions 2.4 Ultrasonic test is carried out in accordance with relevant standards, specifications and OH&S requirements
3 Conduct nondestructive testing	3.1 Select the most appropriate test for the application 3.2 Testing equipment is selected and prepared in accordance with standards and/or procedures 3.3 Nondestructive test is carried out in accordance with relevant standards, specifications and OH&S requirements 3.4 Nondestructive testing equipment is cleaned and stored in accordance with procedures, OH&S requirements and manufacturer instructions
4 Conduct visual examination	4.1 Crossings and switches are visually assessed for defects in accordance with standards and/or procedures
5 Identify and classify defects	5.1 Indications are assessed and defects detected in accordance with standards and/or procedures 5.2 Defects are classified in accordance with standards and/or procedures 5.3 Defective components are marked in accordance with standards and/or procedures
6 Complete documentation	6.1 Test results are reported in accordance with standards and/or procedures 6.2 Documentation on work undertaken is completed in accordance with workplace requirements

Required Skills and Knowledge

REQUIRED KNOWLEDGE AND SKILLS

REQUIRED KNOWLEDGE AND SKILLS

This describes the essential knowledge and skills and their level required for this unit.

Required knowledge:

- Relevant safety, OH&S and environmental procedures and regulations
- Ultrasonic testing requirements for turnouts and special trackwork
- Special inspection requirements for alloy hardened crossings
- Application of dye penetrant testing and magnetic particle testing to rail
- Types of rail defects found in turnouts and rail defect classification
- Workplace procedures for the testing of turnouts and rail using nondestructive testing equipment
- Problems that may occur during the testing of turnouts and rail using nondestructive testing equipment, and action that can be taken to report or resolve the problems
- Hazards that may exist during the testing of turnouts and rail using nondestructive testing equipment, and ways of controlling the risks involved
- Relevant workplace technical manuals and instructions
- Relevant communication systems and procedures
- Authorisation/approval processes and procedures
- Relevant recording and documentation procedures

Required skills:

- Communicate effectively with others when testing turnouts and rail using nondestructive testing equipment
- Read and interpret technical data, drawings, instructions and manuals relevant to the testing of turnouts and rail using nondestructive testing equipment
- Interpret and follow operational instructions and prioritise work
- Complete documentation related to the testing of turnouts and rail using nondestructive testing equipment
- Operate communication equipment to required protocol
- Promptly report and/or rectify any identified problems, faults or malfunctions that may arise when testing turnouts and rail using nondestructive testing equipment in accordance with regulatory requirements and workplace procedures
- Implement contingency plans for unexpected events when testing turnouts and rail using nondestructive testing equipment
- Identify hazards associated with ultrasonic, dye penetrant and magnetic particle testing
- Apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
- Monitor work activities in terms of planned schedule
- Modify activities depending on differing operational contingencies, risk situations and

Required skills:

environments

- Work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- Select and use hand tools, power tools and equipment
- Adapt to differences in equipment in accordance with standard operating procedures
- Select and use required personal protective equipment
- Check turnouts for observable faults
- Apply special inspection requirements for alloy hardened crossings
- Carry out dye penetrant testing of switch blades
- Apply special testing requirements for wire feed repair welds in crossings
- Identify types of rail defects in switches and crossings
- Select probes to use to locate each type of defect and calibrate screen to find each defect type
- Check and maintain nondestructive testing equipment
- Set up probes for each type of test
- Test with appropriate probes for each type of defect
- Locate, measure and assess defect size for all defect types
- Use sizing definitions
- Report test results

Evidence Guide**EVIDENCE GUIDE**

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills, the range statement and the assessment guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

- The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of applying:
 - the underpinning knowledge and skills
 - relevant legislation and workplace procedures
 - other relevant aspects of the range statement
- Assessment must include exercises which demonstrate competent performance of the following in a range of situations:
 - identifying the location and appropriate type of test

EVIDENCE GUIDE

- to be conducted
- conducting tests using hand directed equipment and/or nondestructive testing applications
 - checking and maintaining testing equipment appropriately
 - completing testing reports
- Context of and specific resources for assessment**
- Performance is demonstrated consistently over a period of time and in a suitable range of contexts
 - Resources for assessment include:
 - a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or
 - access to an appropriate range of relevant operational situations in the workplace
 - In both real and simulated environments, access is required to:
 - relevant and appropriate materials and equipment, and
 - applicable documentation including workplace procedures, regulations, codes of practice and operation manuals
- Method of assessment**
- Assessment of this unit must be undertaken by a registered training organisation
 - As a minimum, assessment of knowledge must be conducted through appropriate written/oral tests
 - Practical assessment must occur:
 - through activities in an appropriately simulated environment at the registered training organisation, and/or
 - in an appropriate range of situations in the workplace

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

- Operations may be conducted:
- by day or night
 - in weather conditions specified in relevant standards

RANGE STATEMENT

- Work may be conducted in:
- restricted spaces
 - exposed conditions
 - controlled or open environments
- Work may involve exposure to:
- chemicals
 - dangerous or hazardous substances
 - movements of equipment, goods and vehicles
- Types of ultrasonic test and/or visual examination and/or nondestructive test may vary according to:
- location
 - rail mass or type
 - crossing type and material
 - switch type and material
 - test requirement
- Test requirements may include:
- acceptance testing (ultrasonic, geometric alignment and visual) of new crossing repair welds
 - ultrasonic testing of crossings and switches
 - dye penetrant testing of plain rail and switches
 - magnetic particle testing on plain rail and crossings
 - visual assessment of manganese and CV crossings
- Equipment may include:
- ultrasonic testing units
 - ultrasonic probes
 - alignment gauges
 - magnetic particle testing units
- Material may include:
- coupling medium
 - dye penetrant
 - marking pens/paint
- Liaison may include:
- internal or external personnel from other work areas (e.g. train controllers, electricians)
- Communications equipment may include:
- two-way radios
 - telephones/mobile phones
 - agreed audible or hand signal
- Depending on work context, safety and personal protective equipment may include:
- high visibility clothing
 - hearing protection
 - gloves
 - sunscreen
 - sunglasses
 - safety glasses
 - insect repellent
 - safety headwear
 - safety footwear
 - portable radios/mobile phones

RANGE STATEMENT

- Depending on the type of organisation concerned and the local terminology used, workplace procedures may include:
- Information/documents may include:
- Applicable procedures and codes may include:
- hand lamps
 - flags
 - safety devices
 - company procedures
 - enterprise procedures
 - organisational procedures
 - established procedures
 - operational instructions, policies and workplace procedures
 - relevant logs or record books
 - work orders
 - technical instructions
 - manufacturers or workplace equipment instructions and operation manuals
 - emergency procedure manuals
 - two-way radio/mobile phone operation procedures
 - QA plans, data and document control
 - conditions of service, legislation and industrial agreements including workplace agreements and awards
 - legislated rail safety requirements including acts and regulations from each applicable state and territory together with any nationally approved compliance codes and/or guidelines
 - relevant Australian Standards and related requirements, including AS 4292
 - relevant state/territory OH&S legislation
 - relevant state/territory environmental protection legislation

Unit Sector(s)

Not Applicable

Competency Field

Competency Field S - Construction and Installation