Sydney Trains

Engineering System Integrity

Engineering Standard
Signalling and Control Systems

ST S 43015

Plan and Direct Inspection and Testing of Signalling Works (SCS15)

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Document control

Version	Date	Author/Prin. Eng.	Summary of change
1.0	28 May 2018	Mark Albrecht	First issue as a Sydney Trains document
1.1	13 December 2022	David Mulley	3-year review: no changes to technical content. Date and version number updated

Summary of changes from previous version

Summary of change	Section
UEENEEN128A updated to UEERS0018 to reflect current version	1.5

Table of Contents

1 Plan and Direct Inspection and Testing of Signalling Works (SCS15)

This unit covers the application of knowledge and skill required to lead, plan and direct inspection and testing activities on new or altered signalling systems under the direction of the Commissioning Engineer.

This includes planning, direction, controlling and ensuring that all the inspection and testing plans, procedures, activities and tasks required are completed and documented.

Terms shown as (**bold**) are detailed and explained in Section 1.3 Range of Variables.

1.1	Elements	1.2	Performance Criteria
SCS15.1	Prepare for and plan the inspection and testing activities	SCS15.1.1	Gather all necessary **information** relating to the inspection and testing of the **signal system** ensuring that it is the latest approved version
		SCS15.1.2	Identify and analyse the extent of inspection and testing required
		SCS15.1.3	Identify the types of testing required. Carry out the necessary risk assessments to confirm local conditions and arrangements are suitable to implement the Inspection and testing plan
		SCS15.1.4	Produce the inspection and testing plans and documentation for inspecting and testing the **signal system** in accordance with **organisational procedures**
		SCS15.1.5	Identify the **resources** required to efficiently undertake the inspection and testing requirements
		SCS15.1.6	Ensure the Inspection and testing plan considers WHS requirements contained in legislation and **organisational procedures**
SCS15.2	Implementation, control and coordinate the inspection and testing activities	SCS15.2.1	Organise the inspection and testing activities to ensure they are implemented in accordance with **organisational procedures**

		SCS15.2.2	Provide clear and accurate information and instructions to the testing teams which accurately identifies the scope of work to be completed
		SCS15.2.3	Control and manage the use of **resources,** ensuring personnel are used in accordance with their competence, to achieve the most effective results during inspection and testing
		SCS15.2.4	Ensure inspection and testing results are recorded in accordance with **organisational procedures**
		SCS15.2.5	Ensure that any changes to the **information** obtained are assessed for impact and reflected in updated inspection and test documentation
		SCS15.2.6	Monitor and report progress of the inspection and testing activities being undertaken against the Inspection and test plan
		SCS15.2.7	Ensure anomalies found during inspection and testing and any **unexpected events** are dealt with in accordance with **organisational procedures**
SCS15.3	Finalise Inspection and Testing Activities	SCS15.3.1	Ensure outstanding or incomplete inspection and testing activities are completed or dealt with in accordance with **organisational procedures**
		SCS15.3.2	Ensure **test records are** completed and handed to the Commissioning Engineer
		SCS15.3.3	Support the Commissioning Engineer in commissioning and certifying the **signal system**

1.3 Range of Variables

Signal System includes:

- Interlocking and field equipment
- Control System
- Communication System
- Other Systems that interface with the Signalling System e.g. Tunnel Ventilation, Fire and Life Safety Systems
- Traction return
- Trackside monitoring systems
- ATP trackside and on board equipment
- Compressed air systems
- Power supply systems and monitoring
- Cable and cable route.

Resources include:

- Personnel
- Test Equipment
- Possessions and safeworking requirements.

Test Equipment includes:

- Tools
- Meters
- Shunts
- Bridges
- Gauges
- Test Trains.

Test Records includes:

- Test certificates
- Track history cards
- Points history cards
- Inspection and test forms and checklists
- Test copies of designs
- Commissioning copies of design.

Information includes:

- Approved signal functional specification
- Approved signal design
- Relevant standards and specification including Organisational Procedures below
- Working drawings
- Standards drawings.

Unexpected Events include:

- Accidental interference with the existing signalling equipment.
- Anomaly found in existing signalling system.

Organisational Procedures include:

- TfNSW standards and Sydney Trains procedures – including those listed below.

Relevant standards and instructions include:

- *SPG0711 Inspection and Testing of Signalling*
- *MN S 4000 Signalling Safeworking Procedures* (Manual J)
- *RailSafe Network Rules and procedures – 'Work on Track' (NWT) requirements*
- *Sydney Trains and OEM equipment manuals.*

Work Activities may include:

- Identify the equipment and system tests to be included in the inspection and test plan.
- Identify the interfaces between the system under tests and the existing signalling system and mitigate the risks of interference with the operational system (Site Integrity Agreement, Permit To Work).
- Use the latest approved version of designs, working drawings, detail site surveys to produce the inspection and testing plan.
- Prepare the inspection and test documentation as per organisational procedures.
- Define priorities and timescales to ensure the best use of the resources.
- Plan staging and possessions with other disciplines to ensure suitable timescales for inspection and testing activities.
- Establish and maintain effective communication with all people involved in inspection and testing activities. These can include testing teams, maintenance, design, operations and other disciplines.
- Incorporate the following inspection and test plans:
  - Design integrity test plans
  - Control and communications system tests
  - Other system test plans (CBI networks, input/output tests)
  - Mechanical interlocking test plans.

Working Activities specifically exclude:

- Booking signalling equipment out of, or into, operational service.

1.4 Knowledge and Skill Requirements

The following underlying knowledge elements are requirements for the achievement of this competence:

- The critical nature of signal systems and their correct operation.
- Organisational safeworking procedures.
- The correct mode of operation of the system being tested.
- The types and durations of testing process suitable for different signal systems.
- What factors might affect the readiness of the system for commissioning.
- Which communication methods are applicable and how to ensure people understand what is required.
- What evidence is required from inspection and testing and how to identify if results are missing or inaccurate and what action to take to gather further information.

The following underlying skill elements are requirements for the achievement of this competence:

- Be able to determine the extent of testing required for all signal systems.
- Understand how other disciplines may affect and impact the inspection and testing.
- Be familiar with the inspection and testing plans of other systems integrate with the system being commissioned.
- Be able to verify the competence of resources to be used for inspection and testing.
- Be able to determine if the records of inspection and testing are complete and represent an accurate record of the testing, and have been undertaken as per organisational procedures.
- Be able control changes to the test plan and schedule to ensure the required resources are informed.
- Be able to monitor activities against the inspection and test plan.
- Be able to monitor progress of work against the schedule.
- Be able to read and interpret all signalling documentation.
- Be able to set up a communication system using the correct protocols.
- Be able to set up reporting and contact relationships.

1.5 Competency Requirements

The following knowledge, competency and entry requirements shall be demonstrated as a pre-requisite to the awarding of this competency.

Pre-Requisite Entry Requirements

- Rail Industry Safety Induction card (RISI)
- WHS General Construction Induction Training Card (GIT card)
- Rail Safety Worker Category 2 Health
- Electrical Trades Certificate or relevant Tertiary qualification
- Demonstrated experience in either Circuit Function Tester Authorisation or IRSE License 1.3.190 Tester in Charge.

Training requirements

- EI40 Sydney Trains Signalling Safeworking Procedures
- ST46 Signal Circuit Inspection and Testing
- EJ05 Signalling Principles 1
- EJ06 Signalling Principles 2
- Inspection and Testing plans, programs, documentation and signalling packages, documentation management or other equivalent approved training.

Technical Competency requirements

- Be assessed as competent in Competency Standard *ST S 43015 Plan and Direct Testing and Commissioning of Signalling Works* using Competency Assessment Tool *MN S 43015 Plan and Direct Testing and Commissioning of Signalling Works*.
- UEERS0018 Test and Commission Rail Power Equipment

Behavioural Competency requirements

- Deciding and initiating action.
- Applying expertise and technology.
- Analysing.
- Planning and organising.
- Delivering results and meeting customer expectations.

Note:
Signal Tester in Charge Authorisation requires an interview with the Licensing Board as described in MN S 41412 Section 10 unless the applicant has progressed from the Circuit Function Tester Authorisation.

1.6 Evidence Guide

This provides essential advice for the assessment of the unit and must be read in conjunction with the performance criteria and range statement. Each element and associated performance criteria must be demonstrated on at least two occasions.

Before the critical aspects of evidence are considered, all pre-requisites must be met.

Candidates demonstrate their knowledge and understanding of the planning, directing and managing **signal system** inspection and testing in preparation for a commissioning by showing:

- Documentary evidence of appropriate training and qualifications held
- Evidence of completed training courses
- A log book detailing relevant experience
- Responses to questioning by the competence assessor

Candidates demonstrate their competence to perform the required management of signal inspection and testing activities in by: Having their evidence assessed and answering questions set by the assessor.

Critical aspects of evidence required to demonstrate competency in this unit

Demonstrated consistent performance across a representative range of contexts from the prescribed list below.

Lead the inspection and testing of systems, including the following:

- Take responsibility for inspection and testing activities.
- Accurately identifying and analysing the extent of inspection and testing.
- Preparing and managing the Inspection and test plan.
- Ensuring signalling and general safeworking procedures are accurately applied.
- Control of test equipment including safe control and use of bridges (PR S 40002).
- Interpreting plans and specifications correctly and ensuring they are the latest approved version.
- Ensuring that any change to the original information is assessed for impact on the inspection and test plan.
- Directing and communicating effectively with team members.
- Ensuring that all checks, tests and measurements have been performed correctly and identify correct action for any tests that have not been carried out.
- Ensuring that technical and operational specifications are complied with.
- Completing relevant inspection and test records and documentation.
- Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items.

1.7 Assessment Context

This unit should be assessed as it relates to normal workplace practice using procedures, information and resources typical of a workplace. This will include simulation as a suitable strategy for assessment.