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Issue:	03
Date:	2 June 2012
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Level 2

Signalling Works Testing Training and Competence Modules

Endorsement and Authorisation

For endorsement, authorisation and issue record of this document, please refer to NR/L2/SIG/30014

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Issue record

Issue	Date	Comments
1	Jun 08	Initial Issue
2	Dec 09	Updated to correct a contradiction in Network Rail approval of Testers in Charge under mentorship.
03	Jun 12	Updated to reflect changes to the modular training requirements, to provide consistency with other chapters / sections of the handbook and updates and clarifications following industry feedback.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 1 December 2012.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

Reference documentation

NR/L2/CTM/012	Competence and Training in Signal Engineering
NR/L3/SIG/11231	Signal Maintenance Testing Handbook
NR/L2/SIG/30014	Signalling Works Testing Handbook
NR/L2/SIG/30014/B110	Signalling Works Testing IRSE Licensing Requirements
NR/L2/SIG/30014/B310/MR01	Signalling Works Testing Staff Mentorship Record form
NR/L2/SIG/30014/C120/TP12	Test Plan Appendix 2, Testers' Identity and Mentorship Register
NR/L2/SIG/30014/B410	Signalling Works Testing Staff Competence Assessment
NR/L2/SIG/30014/B510	Project Specific Appointment of Signalling Testers in Charge
NR/L2/SIG/30014/E110	Signalling Works Testing Glossary
NR/L2/SIG/30014/G110	Signalling Non-Conceptual Works and Emergency Testing

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Contents

1 Purpose	5
2 Scope	5
3 Flowchart	5
4 Procedure	5
4.1 Signalling Works Testing Modules	5
4.2 G110 Testing Competencies	13
4.3 Modular Training Courses	14
4.4 Equipment Specific Testing Training Courses	14
4.5 Mentorship	14
5 Abbreviations and Definitions	18
5.1 Abbreviations	18
5.2 Definitions	18
Appendix A Likely Signalling Works Testing Competence Flowchart	19
Appendix B Module 1 - Tester in Charge - Typical Course Syllabus	21
Appendix C Module 2 - Principles Testing- Typical Course Syllabus	22
Appendix D1 Module 3A - Verification Testing of Equipment Housings (factory testing / non-operational environment) - Typical Course Syllabus	23
Appendix D2 Module 3BL - Functional Testing of Equipment Housings - Typical Course Syllabus	24
Appendix D3 Module 3BX - Functional Testing of Level Crossing Equipment - Typical Course Syllabus	25
Appendix D4 Module 3BI – Functional Testing of Interlockings - Typical Course Syllabus	26
Appendix D5 Module 3C – Verification Testing of Equipment Housings (on-site / operational environment) - Typical Course Syllabus	27
Appendix D6 Module 3D – Verification Testing of Signalling Cables - Typical Course Syllabus	28
Appendix E1 Module 4T – Functional Testing of Trackside Equipment – Testing of Track Circuits - Typical Course Syllabus	29
Appendix E2 Module 4P – Functional Testing of Trackside Equipment - Testing of Points - Typical Course Syllabus	30

Ref:	NR/L2/SIG/30014/B310
Issue:	03
Date:	2 June 2012
Compliance date:	1 December 2012

Appendix E3 Module 4S – Functional Testing of Trackside Equipment - Testing of Signals, AWS and TPWS - Typical Course Syllabus	31
Appendix E4 Module 4A – Functional Testing of Trackside Equipment - Testing of Axle Counter arrangements - Typical Course Syllabus	32
Appendix E5 Module 4M – Functional Testing of Trackside Equipment - Testing of Mechanically operated trackside equipment - Typical Course Syllabus	33
Appendix E6 Module 4X – Verification of Level Crossing installations - Typical Course Syllabus	34
Appendix F Module 5 - Test Assistant - Typical Course Syllabus	35

Ref:	NR/L2/SIG/30014/B310
Issue:	03
Date:	2 June 2012
Compliance date:	1 December 2012

1 Purpose

This document is part of the suite of documents contained within the Signalling Works Testing Handbook, [NR/L2/SIG/30014](#), which together detail the requirements for signalling works testing activities.

This Level 2 document gives detailed definitions and explanations of the Signalling Works Testing Competence Modules.

It also gives guidance on the outline of the courses available to train individuals to each Signalling Works Testing modular competence level.

It sets the requirements for mentorship of signalling works testing staff undertaking activities where they are not yet fully competent and therefore it is identified on their Certificate of Competency that mentorship is required.

2 Scope

This level 2 standard applies to work that meets the selection criteria for [NR/L2/SIG/30014/A110](#) or [NR/L2/SIG/30014/A210](#) as defined in [NR/L2/SIG/30014/A100](#).

3 Flowchart

See Appendix A for the Likely Signalling Works Testing Competence Flowchart.

The flowchart demonstrates the most likely progression through the testing modules, but is not exhaustive and alternative progression routes are permissible.

4 Procedure

4.1 Signalling Works Testing Modules

4.1.1 General

Elements of signalling works testing competencies are split into modular competencies. These modules are levels of competence, and for some levels training courses have been developed to aid the progression towards competence.

Training courses, where available, should be the normal method of progressing to the next level of competence. Attendance on the full course is not mandatory in all circumstances, providing that the individual has sufficient skill, knowledge and experience and are able to demonstrate competence in all the requirements covered by the modular course, for example by successfully completing the course assessment.

Ref:	NR/L2/SIG/30014/B310
Issue:	03
Date:	2 June 2012
Compliance date:	1 December 2012

4.1.2 Module 1 - Tester in Charge

4.1.2.1 IRSE Definition - Licence category 1.3.190 Tester in Charge (S)

Covers the role of defining and controlling the testing activities; ensuring that suitable and sufficient evidence is gathered to confirm that the system meets the requirements appropriate to the application, and is fit for Entry into Operational Service. Applicants will be capable of identifying the testing requirements and developing a test plan which is sufficiently robust to ensure that the system meets the requirements. They will also be capable of modifying the test plan as required in a controlled manner and dealing with situations that may arise, which result in restricted use of the system.

4.1.2.2 Network Rail Definition

The Tester in Charge (TIC) has overall responsibility for the testing and commissioning of new and altered signalling systems and is appointed by Network Rail in accordance with [NR/L2/SIG/30014/B510](#).

Module 1 is split into four competencies:

- Module 1S - Simple Works
- Module 1C - Complex Works
- Module 1M - Major Works
- Module 1E - Signalling Electronic Systems Works

In the context of Module 1, guidance on the interpretations of Simple, Complex, Major and Signalling Electronic Systems Works is as follows:

Simple Works Projects

- Use 5 or less testing teams per shift
- Do not abolish or create any Signal Control Areas
- May involve a small amount of Control Table or Principles Testing
- Affect a minimal number of routes
- Have one main commissioning shift, or several separate minor commissionings
- Have minimal involvement with other disciplines
- Do not involve specialised staff and planning
- Do not involve safety cases and novel Testing Specifications
- May use the Tester in Charge as a skills Tester

Ref:	NR/L2/SIG/30014/B310
Issue:	03
Date:	2 June 2012
Compliance date:	1 December 2012

Complex Works Projects

Use 10 or less testing teams per shift

May abolish but do not create any Signal Control Areas

Involve Control Table or Principles Testing

Have multiple commissioning shifts or stages

Have significant involvement with other disciplines

Include all jobs involving level crossing control alterations, unless part of a major works project

May be many simple jobs combined

May need highly specialised staff

May need special planning and co-ordination attention

May involve safety cases, novel Testing Specifications, etc.

May not use the Tester in Charge as a skills Tester during major commissionings

Major Works Projects

Use 10 or more testing teams per shift

May abolish or create Signal Control Areas

Require a Testing Manager

May be many complex jobs combined

May not use the Tester in Charge as a skills Tester during major commissionings

Signalling Electronic Systems Works Projects

Involve primarily new work or alterations to signalling electronic systems

Use 5 or less testing teams per shift

May involve a small amount of Control Table or Principles Testing where this is a requirement of the work on the electronic systems

May involve a small amount of conventional testing, for example minor wiring changeovers and subsequent testing, where this is a requirement of the work on the electronic systems

Affect a minimal number of routes or a defined geographical area (e.g. an SSI control area)

Have one main commissioning shift, or several separate minor commissionings

May use the Tester in Charge as a skills Tester

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Ref:	NR/L2/SIG/30014/B310
Issue:	03
Date:	2 June 2012
Compliance date:	1 December 2012

4.1.2.3 Training and Competence

A modular training course is available for Module 1 which leads to Module 1S competence subject to mentorship requirements, and Employer's competence assessment in accordance with [NR/L2/SIG/30014/B410](#).

Progression to Mod 1C and Mod 1M shall be by suitable and sufficient work experience under mentorship.

There is currently no modular course available for Module 1E. It is anticipated that progression to this competence is from Module 1S, 1C or 1M, or from Module 6 with appropriate knowledge, skill and work experience, or from a Module 1E course should one become available.

4.1.3 Module 2 - Principles Tester

4.1.3.1 IRSE Definition - Licence category 1.3.180 Signalling Principles Tester

Covers the role of undertaking testing activities which are independent of the design; and provide suitable and sufficient evidence to confirm that the operational, technical, and safety principles demanded by the designated authorities have been validated.

4.1.3.2 Network Rail Definition

Signalling Principles Tester/s test to confirm that the signalling system provided conforms to Railway Group and Network Rail Standards and Statutory Requirements, and is fit for purpose. Includes Control Table Testing, Aspect Sequence Testing and Principles Testing. These activities form the higher levels of Validation Testing.

Module 2 is split into three competencies:

Module 2SC - Simple Control Table Testing

Module 2SP - Simple Principles Testing

Module 2CP - Complex Control Table and Principles Testing

In the context of Module 2, guidance on the interpretations of Simple and Complex is as follows, although this is not exhaustive and other elements may need to be taken into consideration when assessing competence.

Typical Simple principles testing would include:

- Straightforward point controls such as locking by train detection, direct or maintained locking by setting of signalled routes, anti pre-selection of points, route setting and locking of points, and incorrect route calling of points
- Automatic signal controls
- Controlled signals with one class of route, limited opposing route locking, and straightforward signal route interlocking and aspect controls
- Simple aspect sequence testing
- AWS and TPWS controls

Testing that does not meet these requirements is, by default, classed as Complex.

Ref:	NR/L2/SIG/30014/B310
Issue:	03
Date:	2 June 2012
Compliance date:	1 December 2012

4.1.3.3 Training and Competence

A modular training course is available for Module 2 which leads to Module 2S competence subject to mentorship requirements, and Employer's competence assessment in accordance with [NR/L2/SIG/30014/B410](#).

The Simple Works Control Tables Testing category is a prerequisite to the Simple Works Principles Testing category. Progression following the Module 2 training course is normally Control Tables Testing, followed by Principles Testing as more experience is obtained, but depending on the previous experience and competence of the individual, it may be possible for both competencies to be attained simultaneously.

Progression to Module 2CP shall be by suitable and sufficient work experience under mentorship.

4.1.4 Module 3 - Functional or Verification Tester of Ints / Equipment Housings

4.1.4.1 IRSE Definitions

Licence category 1.3.170 Signalling Functional Tester (Module 3B)

Covers the role of undertaking the testing and inspection activities of signalling systems and equipment to provide suitable and sufficient evidence to confirm that they comply with the design specification, meet the requirements appropriate to the application and are fit for entry into service. This licence category also applies to Module 4.

Licence category 1.3.155 Signalling Verification Tester (Module 3A, 3C [& 3D])

A Signalling Verification Tester Operational Environment {Factory Signalling Verification Tester} is responsible for undertaking tests on signalling components and equipment in accordance with the test specifications and plans (typically in preparation for Functional Testing) in the operational railway environment {in a non-operational railway environment}. The Verification Tester is given the test plan for the work to be completed, rather than being required to develop it.

The Verification Tester licence category is awarded for demonstration of competence in one or more of the following Modules:

- 1.3.155X Verification Tester – Operational Environment (Module 3C [& 3D])
- 1.3.155Y Verification Tester – Non-operational Environment (Module 3A [& 3D])

4.1.4.2 Network Rail Definition

Functional Tester

The individual responsible for undertaking the functional testing of signalling equipment housings to confirm that the appropriate design, installation and testing specifications are met and that the application is fit for Entry into Operational Service. Includes changeover, strap and function or circuit function testing, through testing and power supply testing.

Module 3BL - Functional Testing of Location type circuits

Module 3BX - Functional Testing of Level Crossing circuits

Module 3BI - Functional Testing of Interlocking circuits

Ref:	NR/L2/SIG/30014/B310
Issue:	03
Date:	2 June 2012
Compliance date:	1 December 2012

Verification Tester

The individual responsible for undertaking the verification testing of signalling equipment to confirm that the appropriate design, installation and testing specifications are met and that the application is fit for Entry into Operational Service. Includes location / equipment room inspection, wire count, continuity testing, recovery identification and cable testing.

Module 3A - Verification Testing of Equipment Housings (factory testing / non-operational environment)

Module 3C - Verification Testing of Equipment Housings (on-site / operational environment)

Module 3D - Verification Testing of Signalling Cables

4.1.4.3 Training and Competence

Modular training courses are available for all Mod 3 competencies, which lead to Module 3 competence subject to mentorship requirements, and Employer's competence assessment in accordance with [NR/L2/SIG/30014/B410](#). SMTH core skills and cable testing competence is deemed to be the equivalent of Module 3D training.

Competence for Module 3B is split into three categories:

3BL Location type circuits – Equipment housings with no / minimal interlocking controls. Includes both location cases and equipment rooms, and simple alterations in interlocking housings. Any alteration in interlocking housings shall be limited to line circuits or circuits normally housed in location cases.

3BX Level Crossing type circuits – Equipment housings containing specific circuits that control Level Crossings.

3BI Interlocking circuits - Equipment housings with significant interlocking controls.

The Locations category (3BL) is a prerequisite to the Level Crossing and Interlocking categories.

It is also possible to carry out conversion training and assessment to convert to Module 3 from SMTH, without attendance at the full modular course(s), due to the previous experience and underpinning knowledge of those holding an SMTH certificate.

Ref:	NR/L2/SIG/30014/B310
Issue:	03
Date:	2 June 2012
Compliance date:	1 December 2012

4.1.5 Module 4 - Functional Tester of Trackside Equipment

4.1.5.1 IRSE Definition

Licence category 1.3.170 Signalling Functional Tester (Module 4)

Covers the role of undertaking the testing and inspection activities of signalling systems and equipment to provide suitable and sufficient evidence to confirm that they comply with the design specification, meet the requirements appropriate to the application and are fit for Entry into Operational Service. This licence category also applies to Module 3B.

4.1.5.2 Network Rail Definition

The individual responsible for undertaking the functional testing of trackside signalling equipment to confirm that the appropriate design, installation and testing specifications are met and that the application is fit for Entry into Operational Service. Includes Testing of Trackside Equipment such as Signals, Points, Track Circuits, Axle Counters, AWS, TPWS and Level Crossing equipment (e.g. road traffic lights and barriers).

Competence for Module 4 is split into six categories:

- 4T – Testing of Track Circuits. Includes a EBI 200 and 1 other type of track circuit. Includes verification of physical layout arrangements.
- 4P – Testing of Points. Includes HWnnnn machine with back drive and supplementary detector and a clamp lock mechanism.
- 4S – Testing of Signals, AWS and TPWS. Includes filament and LED signals, associated Junction Indicator and Fibre Optic Indicator. AWS to include normal arrangement and suppression. TPWS to include TSS and OSS arrangements.
- 4A – Testing of Axle Counter arrangements. Includes an AzLM axle counter arrangement.
- 4M – Testing of Mechanically operated trackside equipment. Includes signals, points and FPL's. Including mechanical detection arrangements.
- 4X - Testing of Level Crossing installations. Includes Verification of Level Crossing layouts and at least 1 barrier pack and boom, and 1 pair of Road Traffic Lights (wig wags).

4.1.5.3 Training and Competence

Modular training courses are available which lead to Module 4 competence subject to mentorship requirements, and Employer's competence assessment in accordance with [NR/L2/SIG/30014/B410](#).

All of these Modules may be delivered separately or combined in any arrangement that suits specific requirements.

Additional equipment specific courses are also required to attain competence in other trackside equipment types.

It is also possible to carry out conversion training and assessment to convert to Module 4 from SMTH, without attendance at full modular course(s), due to the previous experience and underpinning knowledge of those holding an SMTH certificate.