

Ref:	NR/L2/SIG/30097/AppK
Issue:	2
Date:	2 June 2012
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Level 2 module

Appendix K: Verification and Validation (testing)

Endorsement and Authorisation

For endorsement, authorisation and acceptance for use, please refer to NR/L2/SIG/30097, *Modular Signalling*.

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User information

This Network Rail standard contains colour-coding according to the following Red–Amber–Green classification.

Red requirements – *No deviations, could stop the railway*

- **Red requirements shall** always be complied with and achieved.
- Red requirements shall be presented in a red box **with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of red requirements lies with the Professional Head/Standard Owner.
- Red requirements are monitored for compliance.
- Corrective actions shall be enforced if deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Amber requirements – *Controlled deviations, approved risk analysis and mitigation*

- **Amber requirements shall** be complied with unless deviation has been approved in advance.
- Amber requirements shall be presented with an amber sidebar **and with the word “shall” or expressed as a direct instruction**.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner, or their nominated Delegated Authority.
- Amber requirements are monitored for compliance.
- Deviations **may** be permitted. Deviations are approved by the Standard Owner or through existing Delegated Authority arrangements.
- Corrective actions shall be enforced if **non-approved** deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Green – *Guidance*

- Guidance is based on good practice. Guidance represents supporting information to help achieve **Red** and **Amber** requirements.
- Guidance shall be presented with a dotted green sidebar **and with the word “should” (usually in notes) or as a direct instruction**.
- Guidance is **not mandatory** and is not monitored for compliance.
- Alternative solutions may be used. Alternative solutions do not need to be formally approved.
- Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence or documentation.

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1. INTRODUCTION

1.1 Background

The concept of Modular Signalling has been adopted and developed within Network Rail to introduce new products and changes in the implementation of signalling projects in order to bring about significant cost savings. To realise these savings, the Modular Signalling Programme introduces not only new technologies and system architectures but more significantly, new processes and procedures, particularly in the areas of design and testing/commissioning.

1.2 Purpose

This document is an appendix to the Modular Signalling Handbook and defines the principles and processes for testing and Verification and Validation (V&V) that should be applied to Modular Signalling Schemes.

This document does not replace the Network Rail Signal Works Testing Handbook except where specific derogations are detailed elsewhere in the Modular Signalling Handbook. Rather, this document describes opportunities for efficiency within the constraints of that document and is to be considered 'best practice' for Modular Signalling schemes.

1.3 Scope

The document covers the following areas of testing and V&V: -

- Data testing
- Factory Acceptance testing
- System Integration and test
- Site testing
- Commissioning testing
- V&V management
- Competence and independence
- Documentation

The document excludes the following areas which may be related to V&V processes but will be specified separately in supporting documentation: -

- Installation processes and techniques (App. L)
- System handback (App. M)

1.4 Definitions

Configurable item/component - a component which requires preset parameters to be set to enable correct operation e.g. addresses set in hardware

Data-driven - an electronic system which needs data to configure it for correct operation.

System Integrator - An individual or organisation responsible for specifying or assembling or designing a Modular Signalling System. This may be the OEM supplier or a third-party.