

Information for users

To access individual modules referenced within this standard, blue active links are provided from the relevant index pages where these are listed. Clicking on a specific reference will lead to the corresponding document. Please ensure to open **bookmarks** for easier navigation within the document and to access **index of modules**.

Alternatively, you may use the search facility to search for a specific document by using the complete document reference number – such as NR/L3/SIG/30082/002 – in the search field.

Proceed to document ►

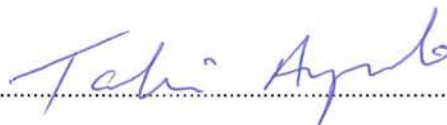
Ref:	NR/L2/SIGELP/27417
Issue:	1
Date:	5 December 2015
Compliance date:	5 March 2016

Level 2

Signalling Power Distribution Diagrams

Endorsement and Authorisation

Endorsed by:



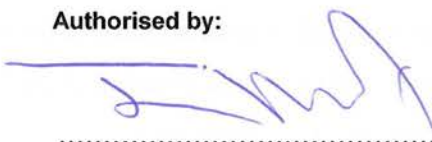
Tahir Ayub, Working Group Chair

Authorised by:



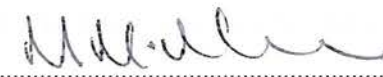
Richard Stainton, Electrical Power Steering Group Chair

Authorised by:



Jeremy Morling, Signalling Steering Group Chair

Accepted for issue by:



Mick McManus, National Standards Manager

This document is the property of Network Rail. It shall not be reproduced in whole or part nor disclosed to a third party without the written permission of Network Rail.

© Copyright 2015 Network Rail.

Uncontrolled copy once printed from its electronic source.

Published and Issued by Network Rail, 2nd Floor, One Eversholt Street, London NW1 2DN.

Ref:	NR/L2/SIGELP/27417
Issue:	1
Date:	5 December 2015
Compliance date:	5 March 2016

User information

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

Red requirements – no variations permitted

- Red requirements are to be complied with and achieved at all times.
- Red requirements are presented in a red box.
- Red requirements are monitored for compliance.
- Non-compliances will be investigated and corrective actions enforced.

Amber requirements – variations permitted subject to approved risk analysis and mitigation

- Amber requirements are to be complied with unless an approved variation is in place.
- Amber requirements are presented with an amber sidebar.
- Amber requirements are monitored for compliance.
- Variations can only be approved through the national non-compliance process.
- Non-approved variations will be investigated and corrective actions enforced.

Green guidance – to be used unless alternative solutions are followed

- Guidance should be followed unless an alternative solution produces a better result.
- Guidance is presented with a dotted green sidebar.
- Guidance is not monitored for compliance.
- Alternative solutions should be documented to demonstrate effective control.

Amendment marks

- First document amendments are presented with a single black line to the right of the affected text.
- Second document amendments are presented with a double black line to the right of the affected text.

Ref:	NR/L2/SIGELP/27417
Issue:	1
Date:	5 December 2015
Compliance date:	5 March 2016

Issue record

Issue	Date	Comments
1	December 2015	First issue

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 5 March 2016.

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

BS 376-2	Railway signalling symbols. Specification for symbols for circuit diagrams
BS 7671	Requirements for electrical installations
IEC 60617	Graphical symbols for diagrams
NR/L2/ELP/21120	E&P Records Management Process
NR/L2/ELP/27311	Engineering Assurance Requirements for Design and Implementation of Electrical Power Engineering Infrastructure Projects
NR/L2/INF/02018	Specification for the Management of Safety Related Infrastructure Records
NR/L2/INI/02009	Engineering Management for Projects
NR/L2/SIG/11201	Signalling Design Handbook
NR/L2/SIG/30003	Engineering Assurance Arrangements for Signalling Engineering Schemes and Services
NR/L2/SIG/30014	Signalling Works Testing Handbook
NR/L2/SIG/30050	Signalling Power Circuit Principles
NR/L3/ELP/27406	Engineering Deliverable Requirements for Electrical Power Asset Design
NR/L2/SIGELP/27410	Specification for Class II Based Signalling Power Distribution Systems
NR/L2/SIGELP/27418	Design, Installation and Testing of Earthing in Signalling Power Systems
NR/SP/ELP/27243	Specification for Signalling Power Supplies
NR/L3/SIG/11303	Signalling Installation

Ref:	NR/L2/SIGELP/27417
Issue:	1
Date:	5 December 2015
Compliance date:	5 March 2016

RSP 1

Developing and Maintaining Staff Competence

Disclaimer

In issuing this document for its stated purpose, Network Rail makes no warranties, express or implied, that compliance with all or any documents it issues is sufficient on its own to ensure safe systems of work or operation. Users are reminded of their own duties under health and safety legislation.

Supply

Copies of documents are available electronically, within Network Rail's organisation. Hard copies of this document may be available to Network Rail people on request to the relevant controlled publication distributor. Other organisations may obtain copies of this from an approved distributor.

Copyright Network Rail

Ref:	NR/L2/SIGELP/27417
Issue:	1
Date:	5 December 2015
Compliance date:	5 March 2016

Contents

1 Purpose	6
2 Scope	6
3 Index of modules	8
4 Legacy diagrams	9
5 Design process	10
6 Design presentation	12
7 Design check and certification	12
8 Configuration control and identification	13
9 Engineering records	14
10 Design changes	16
11 Overlapping and parallel design	16
12 Other special cases of design production	17
13 Definitions	18
Appendix A CAD Cell Dictionary – EP Low Voltage Operational Equipment	22

Figures

Figure 1 – Standard design process	11
------------------------------------	----

Ref:	NR/L2/SIGELP/27417
Issue:	1
Date:	5 December 2015
Compliance date:	5 March 2016

1 Purpose

This standard sets out the detailed requirements for the provision, management and maintenance of signalling power supply network drawings and associated documentation, to enable safe isolations for any purpose, including:

- Stagework,
- Entry into service,
- Operational planning,
- Maintenance,
- Fault finding,
- Signalling possession planning,
- Emergency shutdown works, and
- Recoveries.

The drawings will also facilitate asset management, system alterations and new works.

2 Scope

2.1 Signalling power supply system architecture

This standard applies to each power source used to supply signalling equipment on Network Rail infrastructure, together with the associated distribution arrangements as far as the functional interface at signalling equipment housings. Four subsystem elements may be identified as follows.

- a) Incoming supplies, typically comprising one or more of:
 - Power supplies from the distribution network operator (DNO),
 - Railway 33 kV traction distribution systems,
 - 25 kV distribution systems, or
 - Private HV distribution systems.
- b) Principal supply points (PSPs), typically comprising:
 - An uninterruptable power supply (UPS),
 - Backup generators,
 - Switchgear,
 - Distribution transformers,
 - Feeder protection equipment, and
 - Insulation monitoring.
- c) Distribution system, typically comprising:
 - Power distribution cables,
 - Low voltage switchgear,
 - Distribution interface transformer assemblies (DITAs),
 - Automatic reconfiguration systems, and
 - Signalling step-down transformers.

Ref:	NR/L2/SIGELP/27417
Issue:	1
Date:	5 December 2015
Compliance date:	5 March 2016

NOTE: The system may comprise the following distribution topologies:

- Radial feeders;
- Dual-end manual reconfiguration systems;
- Dual-end automatic reconfiguration systems;
- Single-end manual reconfiguration systems using open rings.

d) Interface to final signalling loads.

NOTE: Final signalling loads via the functional supply point (FSP) comprise an array of signalling equipment such as point machines, signals, level crossings, etc. The power supply interface may comprise a range of equipment, e.g. signalling transformers, battery chargers, UPSs, etc.

NOTE: These four subsystems may be discrete entities or contained together within a building, such as a signalbox or Rail Operating Centre (ROC).

2.2 Production and management of documentation

This standard covers the production and management of signalling power supply network drawings and associated documentation for the lifetime of the infrastructure, irrespective of technology, including:

- Technical content of drawings and associated documentation;
- Site survey and infrastructure assessment before design alterations;
- Correlation of records;
- Design record and production control;
- Configuration control;
- Design modifications;
- Certification process;
- Source record updating;
- Arrangement and presentation of drawings;
- Drawing symbols;
- Modelling tools;
- Special cases, including overlapping and parallel design.

This standard applies from project conception to acceptance into service and, where applicable, to decommissioning and disposal. It covers both proposal drawings and detailed design.

This standard includes both engineering design for construction purposes, and engineering records. It applies to both staff and contractors of Network Rail acting either as asset manager or design authority.

2.3 Types of documentation

The following documentation is covered by this standard and the requirements for each are specified in Module A: