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Information for users

The following document:

NR/L3/ELP/29987 Issue 4

 has had changes made to it, most recently, with effect from **7 January 2016**.

Instructions for use

It is essential that you first read and understand each letter of instruction pertaining to the standard before proceeding to use the standard. You must then apply the requirements of each letter to the standard.

NR/BS/LI/367	Issue 1	07 January 2016	Proceed to letter ►
NR/L3/ELP/29987	Issue 4	05 September 2015	Proceed to standard ►

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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 ►

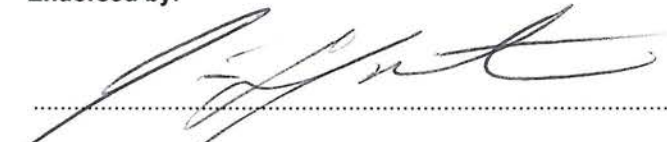
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Level 3

Working On or About 25 kV A.C. Electrified Lines

Endorsement and Authorisation

Endorsed by:



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Authorised by:



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Accepted for issue by:



 Mick McManus, National Standards Manager

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User information

This Network Rail document 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.

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Issue record

Issue	Date	Comments
4	June 2015	Incorporation of several outstanding letters of instruction. Changes to wording to improve clarity and consistency. Reformatted and reworded to comply with current 'house style' for the drafting of Network Rail standards. R-A-G indications and definitions added.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 11th January 2016.

Reference documentation

GE/RT8000	Railway Group standard: Rule Book
GE/RT8016	Railway Group standard: Verification of Electrification Systems and Interactions with Other Systems
NR/L2/ELP/24011	Network Rail standard: Booster Transformer Outages
NR/L2/ELP/24013	Network Rail standard: Notification of Energisation of New AC and DC Electrified Lines
NR/L3/ELP/21067	Network Rail standard: Instructions for Making Out, Issuing and Cancelling High Voltage Permits-to-Work, Sanctions-for-Test and Circuit State Certificates
NR/L3/ELP/27237	Network Rail standard: Overhead Line Work Instructions
NR/SP/ELP/21085	Network Rail standard: Specification for the Design of Earthing and Bonding systems for 25 kV AC Electrified Lines
NR/SP/ELP/21131	Network Rail standard: Warning and Other Signs for AC and DC Electrified Lines
NR/SP/ELP/27203	Network Rail standard: Provision of Isolation, Earthing and Indication Facilities where Local Isolations are Permitted on AC Electrified Lines
NR/SP/ELP/27205	Network Rail standard: Installation and Operation of Buffer Sections and Permanently Earthed Sections in AC Overhead Line Equipment
NR/L3/MTC/EP0203	Control And Amendment Of Electrification Isolation Documentation

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1 Purpose

This modular standard will produce a consistent approach to working on or about 25 kV electrified lines in relation to the dangers arising from proximity to live equipment. This overarching standard for the modules will provide an introduction to the suite of modules and produce consistent use of terminology in the application of the standard.

This standard and each of its twelve modules shall be read in conjunction with all other standards relevant to the activity to be undertaken. Further requirements are contained in the Rule Book Module AC (GE/RT8000/AC).

This standard will mitigate the risks of electric shock or equipment damage resulting from uncontrolled approach to, or contact with, live overhead line equipment, high voltage bushings or cable sealing ends or through mishandling of conductors carrying electric traction current. This standard will also mitigate the risks of injury or equipment damage resulting from incorrect or uncoordinated installation, testing, operation, maintenance, repair and dismantling of 25 kV a.c. electrified equipment.

2 Scope and Modules

This Network Rail standard specifies the actions of persons required to work on 25 kV a.c. electrified lines, or so near to them that danger might arise, including persons who:

- a) assess electrical risk;
- b) plan, prepare and implement mitigations of electrical risk such as isolating, earthing and issuing of formal safety assurance documents;
- c) install, test, operate, maintain, repair and dismantle 25 kV a.c. overhead line equipment and traction return systems;
- d) use special tools to work on live overhead line equipment; or
- e) work on rail vehicles or other equipment within 2.75 metres (9 feet) of overhead line equipment normally energised at 25 kV a.c.

It is applicable to Network Rail personnel and to Network Rail's contractors.

To provide a consistent approach to working on or about 25 kV a.c. electrified lines, Train Operating Companies may, as best practice, apply this standard to infrastructure they control.

The scope of the modules of this standard is as follows.

Module	Title and summary
Standard	<p>Working On or About 25 kV A.C. Electrified Lines</p> <p>This gives an introduction to the suite of modules that together form Network Rail standard NR/L3/ELP/29987 'Working on or about 25 kV A.C. Electrified Lines' and contains a summary of each module together with definitions and abbreviations applicable to the suite of modules.</p>

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Module	Title and summary
1	General Requirements This module states the general requirements for working on or about 25 kV a.c. electrified lines.
2	Assessment of Electrical Risks This module states the requirements for the assessment of the risk of danger arising from live overhead line equipment, and live pantographs and other roof-mounted electrical equipment on trains, when work is to be carried out on or about 25 kV a.c. electrified lines.
3	Management of Electrical Risks This module states the requirements for the management of the electrical risks involved when work is to be carried out on or about 25 kV a.c. electrified lines in order to prevent danger arising from live overhead line equipment, and live pantographs and other roof-mounted electrical equipment on trains.
4	Maintaining the Integrity and Safe Operation of 25 kV A.C. Electrified Lines This module states the requirements for maintaining the integrity and safe and efficient operation of the 25 kV a.c. electrification system, through attention to the position of the overhead line equipment relative to the track, to traction bonding, and to automatic power control inductors.
5	Particular Actions to be Taken by the Infrastructure Maintainer This module states the requirements for particular actions to be taken by the infrastructure maintainer on or about 25 kV a.c. electrified lines.
6	Planning of Isolations This module states the requirements for the advance planning of isolations for the purpose of carrying out work in order to produce a coherent technically compliant isolation plan for a particular week and route on 25 kV a.c. electrified lines.
7	Isolation and Earthing of Overhead Line Equipment This module states the requirements for the isolation, testing and earthing of overhead line equipment and the issue of overhead line permits on 25 kV a.c. electrified lines.
8	Local Isolation and Earthing of Overhead Line Equipment This module states the requirements for the isolation and earthing of overhead line equipment where local isolations are specified in the isolation instructions.

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Module	Title and summary
9	Isolation and Earthing when Constructing or Dismantling Overhead Line Equipment This module states the requirements for constructing overhead line equipment, working on new overhead line equipment and dismantling existing overhead line equipment so that this work does not prejudice the general requirements for working on or about 25 kV a.c. electrified lines.
10	Use of Voltage Testing Devices, Portable Earthing Equipment and Temporary Continuity Jumpers This module states the requirements when using voltage testing devices, portable earthing equipment and temporary continuity jumpers on 25 kV a.c. electrified lines.
11	Working On Overhead Line Equipment This module states the requirements to be met when working on the overhead line equipment on 25 kV a.c. electrified lines.
12	Management of Local Isolation Instructions for Overhead Line Equipment This module states the requirements for the management of local isolation instructions for the isolation and earthing of overhead line equipment where local isolation is allowed on 25 kV a.c. electrified lines.

3 Roles and responsibilities

The following roles, responsibilities and terms have been re-designated, transferred or renamed between issues 3 and 4 of this standard.

NR/SP/ELP/29987 – Issue 3	NR/L3/ELP/29987 – Issue 4
Electrical control room (ECR)	Electrical control (EC)
Emergency isolation	Emergency switch-off
Network Rail (CTRL)	Network Rail (High Speed 1 Ltd)
Person In Charge of Emergency Isolation (PICEI)	Person In Charge of Electrical Emergency (PICEE)
Area E&P Engineer (AEPE/AE&PE)	Delivery Unit Electrification & Plant Engineer (DUE&PME)
Area / Territory	Route
Territory Engineer E&P (TEEP)	Route Asset Manager (E&P) (RAM (E&P))
Territory Telecoms Engineer (TTE)	Route Asset Manager (S&T) (RAM (S&T))
Territory Signal Engineer (TSE)	Route Asset Manager (S&T) (RAM (S&T))
Relevant Network Rail Territory Engineer	Relevant Route Asset Manager (E&P) (RAM (E&P))

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NR/SP/ELP/29987 – Issue 3	NR/L3/ELP/29987 – Issue 4
Relevant Network Rail Territory Instructions	Relevant Network Rail Instructions
Territory Instructions	Network Rail Instructions
Network Rail Territory Instructions	Network Rail Instructions
Relevant Territory Engineers	Relevant Route Asset Managers (RAMs)

4 Definitions

For the purpose of this standard, the following terms and definitions apply.

APC track inductor	Magnet fixed on the sleeper ends before and after a neutral section which operates the automatic power control system on a train.
Authorised person (AP)	Person who holds a certificate to show that they are competent to carry out specific duties in relation to the requirements of this standard.
Authority to test (Form B)	Form of declaration issued by an Electrical Control Operator to a Nominated Person using the Form B 'Authority to Test'. <i>NOTE The purpose of the Form B is to tell the Nominated Person exactly which equipment is switched off and to grant permission to commence testing and applying portable earths.</i>
Automatic dropping device (ADD)	Device which automatically lowers the pantograph to minimise damage to the overhead line equipment if: <ul style="list-style-type: none"> a) the pantograph carbons are displaced or the head is damaged; or b) the pantograph head becomes damaged or detached; or c) the pantograph height limit is exceeded.
Automatic power control (APC)	Means by which the electric power circuits on the traction unit are: <ul style="list-style-type: none"> a) automatically switched OFF before a train enters a neutral section; and b) automatically switched ON after a train leaves a neutral section. <i>NOTE This is also used where a permanently earthed section under which electric trains can run is installed beneath a very low bridge. See 'Permanently earthed section'.</i>