

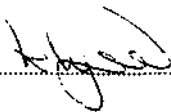
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Issue	2
Date	December 2005

Business Process Document

Specification for controlled track devices for d.c. electrified lines

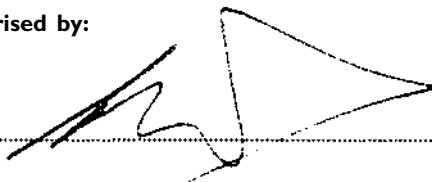
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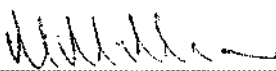
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Summary

This specification states the Directorate's requirements for the design, manufacture and testing of 650/750 V d.c. remotely controlled track devices for use on D.C. Electrified Lines.

Issue record

Issue	Date	Comments
2	December 2005	Re-issued as a SAF3 Business Process Document

Implementation

3 December 2005

Compliance

This Network Rail specification is mandatory and must be complied with by Network Rail and its contractors from 3 December 2005.

When this specification is implemented, it is permissible for all projects, which have formally completed GRIP Level 4, to continue to comply with the Issue of any relevant Network Rail standards current when GRIP Level 4 was reached and not to comply with requirements contained herein unless the head of electrification and fixed plant has stipulated otherwise in the accompanying briefing note.

Where the head of electrification and fixed plant has specified that all projects will comply with the requirements, specific authority not to comply can be sought in the usual manner using the appropriate non-compliance authority processes described in Network Rail standard, [NR/SP/STP/045](#) Managing the process for non-compliance authority (formerly RT/LS/P/045).

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I Purpose

This specification states the requirements for the design, manufacture and testing of 650/750 V rated d.c. remotely controlled track devices for use on D.C. Electrified Lines for the connection and disconnection of electric traction supplies to and from conductor rails. Two types of devices are included:

- a) fault-make, load-break, switch disconnecter (normally known as controlled track switch, CTS);
- b) off-circuit, disconnecter (normally known as controlled track isolator, CTI).

The document is to be read in conjunction with the relevant procurement specification.

2 Scope

This specification applies to all new controlled track devices installed on the D.C. Electrified Lines.

3 Reference documentation

RT/E/S/21028	Network Rail Line Standard for ancillary wiring of electrical equipment on AC & DC Electrified Lines
RT/E/S/21131	Network Rail Line specification for warning and other signs for A.C. and D.C. Electrified Lines
EN 50123	Railway applications - fixed installations - d.c. switchgear
EN 60439	Low-voltage switchgear and controlgear assemblies
IEC 439	
EN 60947	Specification for low voltage switchgear and controlgear
IEC 947	
EN 60529	Specification for degrees of protection provided by enclosures (IP code)
IEC 529	
EN 60269-1	Low-voltage fuses
BS 88	
IEC 269	
BS 5378	Safety signs and colours
BS 142	Electrical protection relays
IEC 255	
EN 60742	Isolating transformers and safety isolating transformers
BS 3535	

4 Definitions

For the purpose of this specification the following definitions shall apply:

British Standard	A standard published by the British Standards Institution. Its alphanumeric identity is prefixed by BS.
Equipment	Equipment including all component parts and accessories.
European Standard	A standard published by the European Committee for Standardisation or by the European Committee for Electrotechnical Standardisation. Its alphanumeric identity is prefixed by EN.
International Standard	A standard published by the International Electrotechnical Commission. Its alphanumeric identity is prefixed by IEC.
Procurement Specification	The contract specific Network Rail documentation, such as, Invitation to Tender or Technical Worksopce.
Network Rail Line Standard	A collective term for a Network Rail Line Specification, Network Rail Line Procedure or a Network Rail Guidance document, published by a directorate of Network Rail PLC.
SCADA	Supervisory control and data acquisition

5 General clauses

5.1 Design, manufacture and workmanship

All material shall be of the quality and of the type most suitable for working under the conditions specified for the full service life of the equipment.

5.2 Spare parts and consumables

The supplier shall make recommendations to the purchaser for holdings of spare parts and consumables based on estimated replacement rates and delivery periods to ensure that the equipment complies with this specification throughout its specified service life. These spare parts and consumables shall be suitable for manual transport to site. The supplier shall indicate the extent of commonality with equipment previously supplied.

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5.3 Drawings

Drawings of the equipment covering each of the following aspects shall be submitted to the purchaser for scrutiny:

- a) General arrangement (internal and external)
- b) Static and dynamic loadings and foundation and fixing requirements.
- c) Schematic/circuit diagrams
- d) Diagram and rating plates
- e) Details of cable entries and terminations
- f) Detailed wiring diagram or schedules.

All drawings shall be of good, legible quality. Four copies of each drawing or as varied by the procurement specification shall be provided.

Where it is essential for clear understanding of the circuits, block or circuit diagrams shall include details of components which are existing or are not being provided by the supplier. Wiring diagrams shall include any unused wires, contacts, plugs, sockets, terminals and the like.

As an alternative to separate circuit and wiring diagrams, combined diagrams may be provided. In this case the position of each wire termination shall be indicated either on the drawing or by means of a schedule of terminations.

A short description of each revision shall be provided under consecutive revision letters or numbers together with the date.

Wherever feasible, some means shall be used to identify the location of the most recent revision, for instance by circling the locations.

All drawings shall be brought up to date as necessary, to provide a permanent as-fitted record and shall be supplied in the software format specified in the procurement specification.

5.4 Instruction manual

The supplier shall produce a comprehensive and specific instruction manual covering all aspects of installation, operation and maintenance and eventual disposal, and shall supply the number of copies stated in the procurement specification. The manual shall provide guidance to enable all work to be carried out safely and efficiently. The manual shall contain only relevant information and shall include:

- a) a description of the construction, installation, functioning and rating of the equipment;
- b) operating instructions, including safety and isolation procedure;

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- c) Procedures with periodicities for routine maintenance including any special precautions, fault finding and major overhaul procedures and periodicity;
- d) full details of recommended adjustments and settings for the equipment and its protective devices where appropriate;
- e) instructions for eventual disposal including safety and handling precautions and recommendations;
- f) drawings, illustrations and data enabling all component parts to be readily identified and to allow procurement for replacement purposes;
- g) the drawings listed in clause entitled 'Drawings';
- h) list of locations and associated serial numbers.
- i) List of all consumable items with Part Numbers or references.

The manual shall be of loose leaf design with at least four retaining rings and with oil resistant hard covers. It shall be of A4 size and include drawings reduced to A3 or A4 size. Drawings reduced in size shall remain clearly legible. The purchaser may accept drawings larger than A3 subject to suitable, clearly labelled protective drawing storage folders being provided for inclusion in the manual.

The manual shall be split into two parts, first part being the generic description and second part being equipment/site specific.

Two copies of the draft manual shall be submitted to the purchaser not later than the end of the third quarter of the period between the contract date and scheduled delivery date and in sufficient time to enable any modifications to be incorporated and the full quantity of final copies to be available prior to delivery of the equipment.

Before the purchaser takes over full responsibility for the equipment, for example, at the expiry of the maintenance period, any necessary modifications shall be made and sufficient copies provided to the purchaser for incorporating into the full quantity of manuals supplied.

In addition two electronic copies of the manual shall be supplied to the purchaser.

5.5 Delivery

The equipment shall be suitably prepared to withstand, without damage or deterioration, the method of transport to site, cramage, storage and positioning stated in the procurement specification. The equipment shall be protected, as necessary, against the weather. The destination for delivery shall be as stated in the procurement specification.

Any factor which may affect the onward delivery to a final site (e.g. dimensions and weight limits) shall be subject to agreement between the supplier and the purchaser.

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5.6 Specific equipment standards

The equipment shall be designed, manufactured, tested at works in accordance with [EN 50123](#), [EN 60947](#), [EN 60439](#), [IEC 947](#) and all other relevant standards.

6 Performance requirements

6.1 General

The equipment shall be fit for its intended purpose.

The controlled track device shall be of the single pole, air insulated, air break type and when specified in the procurement specification shall have a means of isolation. The controlled track device shall be either of the fault-make, load-break type (CTS) or of the off-circuit type (CTI) as specified in the procurement specification.

The equipment shall be complete with all items, including parts, consumables and first fillings of lubricants, desiccants etc., necessary for service operation.

6.2 Environmental conditions

The equipment shall be suitable for its rated characteristics when installed at locations adjacent to railway tracks.

The service conditions are as [EN 50123-1](#) clause 4.1 for normal service conditions as modified for the following special service conditions:

- a) the lower limit of the ambient air temperature during operation shall be taken as -25 °C;
- b) the maximum ambient air temperature shall be +40 °C.
- c) the ambient air is polluted by the presence of airborne iron dust from train brakes; The degree of pollution is PD4 as defined by [EN50124-1](#).
- d) the equipment is subject to strong magnetic fields emanating from adjacent electrical equipment and to vibration caused by passing trains;
- e) hand-held portable radio transmitter/receiver apparatus will be used near the equipment;
- f) any additional conditions as stated in the procurement specification.