Transport for London
London Underground

Category 1 Standard

S1936

1.5 to 935 mm^2 Single Core, 450/750 V, Unarmoured Sheathed and Unsheathed Cables for Use on The System

(formerly Powerlink Technical Specification SP80212 Rev 2)

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1 Purpose

1.1 The purpose of this LU Standard is to apply technical requirements for equipment and systems on the LU power system through the inclusion of a technical specification, previously owned and managed by the Power Service Contractor, UK Power Network Services (UKPNS) Powerlink, as an attachment to this standard.

2 Scope

2.1 This Standard applies to equipment and systems on the LU power system.

3 Requirements

3.1 The mandatory requirements of this standard are set out in Section 7 as an attachment to this document.

3.2 Where an attachment refers to the 'Contractor' it should be taken to mean LU and LU Suppliers following the termination of the Power Service Contract.

3.3 Where the attachment refers to the 'System' it should be taken to mean the LU power system including its associated SCADA system and the operational properties.

Note:	It is the intention to fully re-work this LU standard into the standards format over a period of time. While the content of the ex-Powerlink specification should not conflict with the remainder of the LU standards suite, should any discrepancies occur, these should be brought to the attention of the LU technical authority.

4 Responsibilities

4.1 **The Head of Power Engineering** is responsible for the technical content of this standard. Concessions in relation to this standard shall be directed to the Head of Power Engineering who has overall accountability for compliance with this standard. The Head of Power Engineering may request support from the other technical authorities when reviewing concessions or queries arising from the application of this standard.

4.2 **LU and LU Suppliers** shall be responsible for compliance with the requirements of this standard.

4.3 **Heads of Profession** are the LU technical authorities for each asset group, and shall be responsible for auditing technical compliance with this standard in accordance with the engineering asset grouping of LU Standard S1041 and with respect to the assurance of assets to which they are accountable for. They shall provide support to the Head of Power Engineering, if requested, with regard to any technical issues arising from concession requests or other queries to this standard.

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5 Supporting Information

5.1 Background

5.1.1 From the 16th August 1998 through to the 15th August 2013 the LU power system was operated, maintained, renewed and upgraded by UKPNS Powerlink under the Power Services Contract. The contract was a Private Finance Initiative contract where UKPNS Powerlink were responsible for setting the detailed technical requirements for the LU power system.

5.1.2 At the start of the Power Service Contract on 16th August 1998 LU transferred its detailed technical standards for the LU power system to UKPNS Powerlink. Powerlink has owned and managed these technical standards as Powerlink technical specifications for the duration of the Power Service Contract.

5.1.3 The Power Service Contract ceased on the 16th August 2013 and the UKPNS Powerlink technical specifications for the LU power system were transferred back into LU as Category 1 standards.

Note:	At the time this standard was produced, it was deemed necessary to utilise a non-standard for standard format. This however, does not diminish the mandatory requirements contained within the attachments.

5.2 Safety, Environment and Customer Considerations

5.2.1 Safety, environment and customer considerations relevant to this engineering standard are covered within the text of the attachment.

6 References

6.1 References and Abbreviations

6.1.1 Where references and abbreviations are used in this engineering standard they are given within the text of the attachment.

6.2 Definitions

6.2.1 Where definitions are used in this engineering standard they are given within the text of the attachment.

6.2.2 The following topic specific definitions are created:

a) Within London Underground's Glossary of Terms (1-622) (a Category 1 Standard);

Term	Definition	Source
LU	London Underground us the operating company of the former London Underground Limited.	a
Supplier	Supplier to London Underground, the primary organisation or individual that is selected to deliver a product, service or facility to London Underground and contracting directly to London Underground. This includes Consultants, Contractors, Infracos and PFI Contractors and excludes organisations or individuals selected by and contracting directly to them.	a

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6.3 Person Accountable for the Document

Person accountable for the document
Phil Carmichael - Head of Power Engineering

6.4 Document History

Issue no	Date	Changes	Author
A1	Aug 2013	Incorporation of UKPNS Powerlink technical specification SP80212 Rev 2 as Category 1 LU standard following the termination of the Power Services Contract as per DRACCT No. 01934. No technical requirements have been changed.	G Bloch

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7 Attachment - Technical Specification SP80212 Rev 2 (Ex Powerlink)

1 Introduction

This specification is for use only within the scope of the London Underground Limited (LUL) Power Service Contract (PSC). It is one of a series of specifications which mandate EDF Energy Powerlink (Powerlink) technical and associated requirements for equipment for use on The System.

These specifications are supported by Powerlink Work and Operating Instructions, and shall be read in conjunction with Powerlink Conceptual and Outline Design documentation, as appropriate.

2 Purpose

This specification states the technical requirements for the design, manufacture, testing and installation of single core, 450/750 V, limited fire hazard sheathed and unsheathed, unarmoured, cables of standard sizes 1.5 to 630 mm^2 and non standard size 935 mm^2, and accessories and documentation for use on The System.

Limited fire hazard cables are to be used unless specified otherwise by Powerlink at The Outline Design stage.

3 Scope

This specification applies to new single core, 450/750 V, limited fire hazard sheathed and unsheathed unarmoured cables of sizes 1.5 to 935 mm^2, accessories and documentation, to be installed on The System and intended for use on NON safety critical low voltage circuits for:

(a) the control of traction power supply equipment, including switchgear and d.c. control cables at traction potential, and;
(b) low voltage a.c. and d.c. power applications, including d.c. traction power circuits, but excluding track feeder cables, and;
(c) insulated earthing conductors, and;
(d) other similar applications.

These cables are intended for use where mechanical protection is provided separately or not required for interconnecting between equipments within substations, switchrooms and transformer rooms.

These cables are not to be used for pilot cables and protection circuits between substations. Cables suitable for these applications are covered in Powerlink Specification SP80202.

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4 Definitions

The technical definitions given in the European, International and British Standards referred to herein apply to this specification together with the following:

Agreed cable route	Cable route complying with LUL Engineering Standard E 4710 and/or agreed with Powerlink.
British Standard	A standard published by the British Standards Institution. Its alphanumeric identity is prefixed by BS.
Conceptual and Outline Design documentation	The document(s) issued by Powerlink at the Outline Design stage defining the scope of work, specifying performance, unique operational and design requirements, and identifying service location specific electrical, environmental and interface characteristics.
Detailed Design stage	The stage at which the detailed requirements for equipment and/or work are developed. The proposed design, equipment and/or work are checked at this stage for compliance with the PSC and relevant specifications, and where necessary the concessionary request procedure is initiated.
Equipment	Equipment to include all component parts, cables, accessories and appliances.
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.
Limited fire hazard cable (LSC)	Cable that complies with the standard fire performance requirements as specified in LUL Engineering Standard 2-01001-002.
Operational environment	The physical and electrical conditions under which the cables are to operate.
Outline Design stage	The stage at which the main requirements for the cables and/or work are specified by Powerlink.
Powerlink Operating Instruction	A document published by Powerlink which provides guidance on the application of the Safety Rules and to direct policy on operational limits and procedures.
Powerlink Specification	A document published by Powerlink which mandates technical and associated requirements for equipment and cables for use on The System. Its alphanumeric identity commences with SP8.

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Powerlink Work Instruction	A document published by Powerlink which describes the methods, tools and detailed procedures for the execution of physical work or inspection of Powerlink plant, equipment, cables and buildings.
Power Service Contract	The contract awarded by LUL to Powerlink to deliver low voltage three phase and single phase power; dc power; signalling equipment power; low voltage dc power; Docklands Light Railway high voltage a.c. power; emergency power; and compressed air to prescribed delivery points.
Safety critical (circuits)	Railway signalling circuits that directly control the movement of trains, where failure could lead to either loss of life or serious injury
The System	System means the electrical conductors and apparatus for the distribution and control of electricity from any Bulk Supply Points (and for the avoidance of doubt, excluding any assets belonging to any Regional Electricity Company) and from and including the Generating Stations to and including the Delivery Points and for the production of compressed air all as at the Starting Date and includes the Electrical Control Equipment, the interests in and rights in respect of the Properties granted under this Contract *(PSC)* but excludes LUL's Distribution System, the IT Systems (other than the SCADA System) and the Telephony Systems the Waterloo and City Line, the District Line from Putney Bridge to Wimbledon and Gunnersbury to Richmond, the Bakerloo Line from Queens Park northwards and the interface with the System for each such part as is set out in the Performance Specification and as altered by the Contractor, any Variation, any Known Third Party Works or adoption of Third Party Works.

5 Abbreviations

LUL	London Underground Limited
Powerlink	EDF Energy Powerlink
PSC	Power Service Contract
SCADA	Supervisory Control and Data Acquisition

6 References

Documents referred to by title and/or alphanumeric identity within this specification are listed in Appendix A. Some are mandatory, others provide information or guidance. Unless specified otherwise, reference shall be made to the latest editions.

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