

Standards play an important role in our energy networks allowing us to design, purchase, install and maintain our network assets so they remain safe, secure, and reliable over their lifetimes. The world of standards is extensive and reflects the complex and international nature of the assets we use. Threepwood Consulting has many years' experience of applying International Standards (IEC & ISO), European Standards (EN & CENELEC) and British Standards into the industry standards, published by ENA, used today by electricity network operators in the UK and Ireland. We believe proactive and timely development of our industry standards will be crucial to facilitate the new technologies and applications being developed for our future networks.

General

EAW Regulations 1989
Electricity Safety, Quality and Continuity Regulations 2002.(ESQCR)
HSE HSG230. Keeping Electrical Switchgear Safe
Grid Code
Distribution Code (DCODE)
IEC 60050 (International Electrotechnical Vocabulary)
IEC 60038 (Standard voltages)
BS EN 60071 Series (Insulation co-ordination)
BS EN 60529 (IP Ratings)
ENA TS 98-1 (corrosion protection of new plant and equipment)

Network design and planning

BS EN 60909-0 (Short-circuit calculation)
ENA EREC G74 (Short-circuit calculation)
ENA EREC G78 (LV supplies to mobile antennae on towers)
ENA EREC G81 (Planning and design framework)
ENA EREC P2 (Security of supply)
ENA EREC P5 (LV network design)
ENA EREC P25 (Short-circuit on LV network)

Power quality

BS EN 50160 (Voltage characteristics)
IEC 62749 (Power quality: Characteristics of electricity supplied by public networks)
ENA EREC G5 (Planning levels for harmonics Distortion)
ENA EREC G101 (Assessment of compliance with statutory voltage)
ENA EREC P28 (Planning limits for voltage fluctuations)
ENA EREC P29 (Planning limits for voltage unbalance)

Substation design

ENA TS 41-38 (Design of open terminal stations)
ENA EREC S39 (Fire precautions in subs)
ENA EREC S40 (Prefabricated subs)
ENA EREC G102 (Pressure rise)
BS EN 62271-202 (Prefabricated subs)
IEC 61936-1 (Power installations exceeding 1kV ac)

Earthing design

ENA TS 41-24 (Main earthing systems in subs)
ENA EREC S34 (Assessing earth potential rise)
ENA EREC G12 (PME for LV networks)
ENA EREC P23 (Earth fault loop impedance)
IEC/TS 60479-1 (Effects of current: General aspects)
IEC/TR 60479-5 (Effects of current: Touch voltage threshold)
BS EN 50522 (Earthing of power installations)

NOTE: Abridged title shown in brackets

Switchgear

ENA TS 41-36 (Switchgear for use up to 36 kV)
ENA TS 12-11 (Cable termination enclosures)
ENA TS 37-1 (LV switchgear and controlgear)
ENA TS 37-2 (LV Public distribution assemblies (PENDA))
ENA TS 50-18 (Ancillary electrical equipment)
ENA TS 09-23 (LV link boxes)
BS 6626 (Maintenance of switchgear from 1 kV to 36 kV)
BS EN 60947 Series (LV Switchgear and controlgear)
BS EN 61439-1 (LV switchgear: General)
BS EN 61439-2 (LV switchgear: Power switchgear and control assemblies)
BS EN 61439-5 (LV switchgear: PENDA)
BS EN 62271-1 (HV switchgear: Common Clauses)
BS EN 62271-100 (HV switchgear: Circuit-breakers)
BS EN 62271-102 (HV switchgear: Disconnectors and earth switches)
BS EN 62271-103 (HV switchgear: Switches)
BS EN 62271-200 (HV switchgear: Metal-enclosed switchgear)
ENA TS 41-37 (Switchgear for use on 66 kV to 132 kV systems)

Protection specification

BS 1361 (Domestic cartridge fuses)
BS HD 60269 Series (LV fuses)
BS EN 60282 Series (HV fuses)
ENA TS 48-4 (DC trip relays)
ENA TS 48-5 (Environmental tests for protection systems)
ENA TS 48-6 Series (Functional test requirements for protection relays)
BS EN 60255 Series (Measuring relays and protection equipment)

Transformer specification

ENA TS 35-1 Parts 1-4 (Distribution transformers)
ENA TS 35-2 (Emergency rated transformers)
ENA TS 35-3 (Continuous maximum rated transformers)
ENA TS 35-7 (Tap-changers)
ENA EREP 5 (Padmount transformers)
BE EN 60076 Series (Power transformers)
BS EN 61869 Series (Instrument transformers)
IEC 60214 Series (Tap-changers)

Network Operations

ENA SHE Standard 07 (Model Distribution Safety Rules)
ENA SHA Position Paper 03 (Working at height)

Cable specification

ENA TS 09-9 (XLPE LV waveform)
ENA TS 09-16 (XLPE HV cable for voltages 66V – 132 kV)
BS IEC 60287 (Calculation of current ratings for cables)
BS 7870 Series (LV and MV polymeric insulated cables for use by utilities)
IEC 60502 Series (Power cables from 1 kV to 30 kV)
BS EN 60228 (Cable conductors)
BS EN 61238-1 (Conductor connectors)
BS 5467 (LV armoured cables)
BS 6724 (Fire performance for LV armoured cables)
BS 6622 (MV armoured cables)
BS 8573 (Fire performance for MV armoured cables)
BS 6387 (Fire resistant cables)

Cable accessories and fittings

BS EN 50393 (Test methods for LV accessories)
BS 7888 Series (Tests methods for MV accessories)
BS EN 61442 (Test methods for accessories 6 kV-36 kV)

Cable installation

ENA TS 09-2 (Installation of cables)
ENA TS 97-1 (Special backfill for cables)
TS 12-23 (Cables warning tape and tiles)
TS 12-24 (Plastic ducts for cables)
ENA EREC G57 (Cables in agricultural land)
ENA EREC C98 (Protection of cables crossing bridges)
BS EN 61537 (Cables trays and ladders)

Overhead line design

ENA EREC P27 (Current ratings for HV overhead lines)
ENA TS 43-40 (Wood pole lines up to 33 kV)
ENA TS 43-50 (Wood pole lines up to 132 kV)
ENA TS 43-122 (XLPE covered conductor lines up to 33 kV)
ENA TS 43-125 Parts 1-4 (Design of overhead lines above 45 kV)
ENA TS 43-88 (Wood poles)
TS 43-91 (Stays for overhead lines)
ENA TS 43-90 (Anti-climbing measures)
ENA TS 43-93 (Line insulators)
TS 43-95 (Steelwork for overhead lines)
BS EN 50341-1 (Overhead lines exceeding 1 kV AC)
BS EN 50341-2-9 (INNA based on 50341-1 for GB and NI)

Overhead Operations

TS 43-123 (Fall prevention/arrest systems for poles)
TS 43-119 (Temporary scaffold systems)
TS 43-8 (Overhead line clearances)
HSE GS6 (Avoiding danger from overhead power lines)

A Focus on our Technical Documentation Work



We strive for **excellence** in all that we deliver

Maintain the highest levels of **professional integrity**

Achieve total **client satisfaction**

Collaborate to maximize client **value**

Apply **flexible** and agile solutions to client needs

Utilize **creative and innovative** solutions



Threepwood Consulting Ltd, 76 King Street, Manchester, M2 4NH
Email: info@threepwoodconsulting.com www.threepwoodconsulting.com

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A Network of Standards

Have you ever wondered about the role standards have in the development and operation of our energy networks? At Threepwood Consulting we strongly believe standards and technical documents play a key role in ensuring compatibility, safety, reliability and longevity of our electricity network assets. Our 'Network of Standards' diagram gives an insight into the many standards that have been developed and are being applied in the 'day-to-day' management of our electricity networks, in particular the ENA Engineering Documents - many of which Threepwood has helped to develop. A more detailed index of documents is provided on the back of this brochure.

