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Engineering Recommendation S39

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General fire precautions in substations at 132 kV and below and in enclosed cableways

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PUBLISHING AND COPYRIGHT INFORMATION

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Foreword

This Engineering Recommendation (EREC) is published by the Energy Networks Association (ENA) and comes into effect from the date of publication. It has been prepared under the authority of the ENA Engineering Policy and Standards Manager and has been approved for publication by the ENA Electricity Networks and Futures Group (ENFG). The approved abbreviated title of this engineering document is "EREC S39".

This is the first issue of this Engineering Recommendation.

ENA Engineering Recommendation S2/4 (1976) *Limitations of fire risk at 132 kV and below and in enclosed cableways* required operators of such premises to undertake a fire exposure risk assessment. It gave limited guidance to assist in the classification of fire exposure risk. It also provided specific guidance on the selection of building materials and components along with guidance for the segregation of plant and the disposition of fire-fighting apparatus.

EREC S2/4 has been withdrawn as much of the content has been superseded by two recent documents.

The Regulatory Reform (Fire Safety) Order 2005 [N1] requires general fire safety precautions to be taken for all premises. This effectively replaces the fire exposure risk assessment required by EREC S2/4. In addition, the issue of BS EN 61936-1:2010+A1:2014 *Power installations exceeding 1 kV a.c. Common rules* has superseded the detailed substation design guidance on the selection of materials and the positioning of plant.

This Engineering Recommendation provides guidance on risk assessments of electricity substations and enclosed cableways to ensure compliance with the Regulatory Reform (Fire Safety) Order 2005 [N1]. It also provides guidance to designers of such sites to facilitate in the interpretation of the relevant clauses of BS EN 61936-1.

The term 'user' relates to any user of this document.

Where the term "shall" or "must" is used in this document it means the requirement is mandatory. The term "should" is used to express a recommendation. The term "may" is used to express permission.

NOTE: Commentary, explanation and general informative material is presented in smaller type and does not constitute a requirement.

Introduction

The Regulatory Reform (Fire Safety) Order 2005 [N1] (the Order) replaces previous fire safety legislation. The Order only applies to England and Wales but similar requirements are imposed by the Fire Safety (Scotland) Regulations 2006 and the Fire Safety Regulations (Northern Ireland) 2010.

The Order requires fire precautions to be put in place where necessary and to the extent that is reasonable and practical under the circumstances. It covers general fire precautions and other fire safety duties which are needed to protect 'relevant persons' in case of fire in and around most 'premises'. All operational sites (excluding overhead lines) are included under the definition of 'premises'.

Providing existing physical fire protection arrangements have been kept up to date, it is unlikely that any improvements will be necessary for existing operational sites. However, a fire risk assessment must be undertaken and kept up to date to ensure that any such fire precautions remain current and adequate.

In the context of this Engineering Recommendation, responsibility for complying with the Order rests with the employer. The employer should appoint a 'responsible person'. If there is more than one responsible person for any type of premises (e.g. a dual occupied site), all responsible persons must take all reasonable steps to co-operate and co-ordinate with each other.

The responsible person must carry out a fire risk assessment which must focus on the safety in case of fire of all 'relevant persons'. It should pay particular attention to those at special risk, such as disabled people, those who have special needs and young persons, and must include consideration of any dangerous substance liable to be on the premises. The fire safety risk assessment will help identify risks that can be removed or reduced and to decide the nature and extent of the general fire precautions that need to be taken.

If the organisation employs five or more people, the significant findings of the assessment must be recorded. The Order does not specify any particular format or content for the records.

Thus, in order to comply with the Order, all operational sites are required to have a risk assessment in place to ensure that the general fire precautions necessary for that site have been properly identified, and that assessment must be recorded.

Other legislation also refer to fire safety. The Building Act 1984 encompasses building works within the UK. However, certain buildings including substations belonging to statutory undertakings are exempt.

NOTE: Building Act, Clause 4 (1) (b).

The Building Regulations 2010 [N3], along with the various Building Regulations Approved Documents are also applicable to most building work in the UK. Although substations are exempt from these documents under the exemption in the Building Act 1984, there is also an exemption within the Building Regulations for detached buildings into which people go only intermittently and then only for the purpose of inspecting or maintaining fixed plant or machinery. Where operational premises are used for other purposes, the exemption(s) may not be applicable.

NOTE: Building Regulations. Schedule 2, Class 2 Clause 1 (b).

The Construction (Design and Management) Regulations 2015 impose duties on designers to ensure that they avoid foreseeable risks in the construction, use and maintenance of their design. In the context of this Engineering Recommendation, this means that designers of operational sites need to ensure they have considered fire safety issues.

The Electrical Safety Quality and Continuity Regulations 2002 [N4] (ESQC Regulations) requires every generator and distributor to take all reasonable precautions to minimise risk of fire associated with the equipment in their substations.

NOTE: ESQC Regulation 11 (d).

This Engineering Recommendation provides guidance to ensure that Network Operators use common methodology when undertaking their fire safety risk assessments.

Whilst all substations will fall under the Order, it is probable that a generic assessment can be used for substations of similar design (such as modern unit-type distribution substations) located in similar environments. It is likely that most grid and primary substation will need to be individually assessed.

1 Scope

This Engineering Recommendation applies to all substations operating at a nominal voltage of 132 kV and below and enclosed cableways containing cables operating at 132kV and below excluding transmission installations and generating stations.

NOTE: Sites containing transmission, generation and distribution apparatus will require agreement between the various parties as to which technical standards are applicable.

2 Normative references

The following referenced documents, in whole or part, are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS EN 61936-1:2010+A1:2014, *Power installations exceeding 1 kV a.c. Part 1: Common rules*

BS 5839-1:2013, *Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises*

BS EN 12845:2015, *Fixed firefighting systems. Automatic sprinkler systems, Design, installation and maintenance*

BS EN 13565-2:2009, *Fixed firefighting systems. Foam systems. Design, construction and maintenance*

BS EN 15004-1:2008, *Fixed firefighting systems. Gas extinguishing systems. Design, installation and maintenance*

BS EN 50172:2004, *Emergency escape lighting systems*

Other publications

[N1] Statutory Instrument 2005 No 1541. *The Regulatory Reform (Fire Safety) Order 2005*

[N2] Fire safety risk assessment – factories and warehouses. Ref 05 FRSD 03338(b). ISBN-13: 978 1 85112 8167, ISBN-10. 1 85112 816 6. Department of Communities and Local Government

[N3] Statutory Instrument 2010 No 2214. *Building Regulations 2010 (and associated Approved Documents A to R and Regulation 7)*

[N4] Statutory Instrument 2002 No. 2665, *The Electricity Safety, Quality and Continuity Regulations 2002* (as amended) [N5] Statutory Instrument 1997 No 1713. *The Confined Spaces Regulations 1997*

[N6] Statutory Instrument 1996 No 341. *The Health and Safety (Safety Signs and Signals) Regulations 1996*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
substation
any premises or part thereof which contains equipment for either transforming or converting energy to or from high voltage (other than transforming or converting solely for the operation of switching devices or instruments) or for switching, controlling or regulating energy at high voltage, but does not include equipment mounted on a support to any overhead line

[Electricity Safety, Quality and Continuity Regulations 2002 [N4], Clause 1 (1)]

3.2
enclosed cableway
a tunnel, mezzanine, basement or other enclosure containing cables on racks, trays, brackets or other such means and to which access is necessary

NOTE: An enclosed cableway may also fall under the Confined Spaces Regulations 1997 [N5].

3.3
operational site
any substation or enclosed cableway

3.4
model distribution safety rules (MDSR)
set of generic rules that the Network Operators may use as the foundation of their safety management system for operating on their network