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Engineering Report 129

Issue 2 2018

ROEP risk assessment for third parties using equipment connected to Communications Network Provider lines

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PUBLISHING AND COPYRIGHT INFORMATION

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Amendments since publication

Issue	Date	Amendment
Issue 2	January, 2018	Minor revision to Issue 1. This issue includes the following principal technical changes. Changed ‘BT’ to ‘BT/Openreach’ throughout. Foreword: references to ENA EREC S36 and ENA EREC S37 added to Foreword text. Clause 2, Normative references: existing references updated and new references inserted. Clause 3, Terms and definitions: new definitions added and previous definitions clarified, where appropriate. Clause 6, Risk assessment background: added note to inform reader that relevant reference for the ‘data’ on breakdown voltages is understood to be BS EN 60664-1. Clause 7, Calculations for equipment use: clarified use of the terms ‘telephone’ and ‘telephone handset’ throughout. Clause 8, Conclusions: replaced the terms ‘fast clearance’ and ‘slow clearance’ with ‘fast fault clearance’ and ‘slow fault clearance’ in this clause and throughout the document. Table A.2.a: inserted details for $V_{B.}$ Table A.2.b: inserted details for $V_{B.}$ Table A.4: inserted details for $V_{B.}$

		Annex B: deleted fault analysis content as this is covered by ENA EREP 128. Inserted new Bibliography clause. Details of all other technical, general and editorial amendments are included in the associated Document Amendment Summary for this Issue (available on request from the Operations Directorate of ENA).

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Foreword

This Engineering Report (EREP) 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 “EREP 129”, which replaces the previously used abbreviation “ETR 129”.

Issue 1 of this EREP was prepared in 2007 by a joint working group of Accenture HR services on behalf of British Telecommunications (BT) and the Energy Networks Association (ENA).

This EREP considers hazards to third parties close to electricity substations and/or generating stations. For the purposes of this EREP, all such sites are referred to as substations. These hazards arise from potential differences (due to ROEP caused by an earth fault in the substation) between the third party property infrastructure and any Communication Network Provider (CNP) line serving the property.

The approach adopts the principles established in ITU-T Directives Volume VI [N1] and is consistent with national health and safety legislation, in particular The Management of Health and Safety at Work Regulations 1999 [N2].

This risk assessment in this EREP is intended for use solely by ENA Member Companies and BT/Openreach, and although other CNPs and third parties may refer to the details presented, no responsibility is accepted for its use.

For detailed guidance on safe working practices when working on communication cables subject to ROEP effects, refer to ENA EREC S37 [N3].

In respect of the ROEP levels at substations, the process of information exchange between the ENA Member Companies and the CNPs is described in ENA EREC S36 [N4].

Further discussion and explanation of a risk based approach to shock hazards is described in BS EN 50522 and ENA TS 41-24 [N5].

The term “should” is used in this document 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 normative element.

1 Scope

This EREP considers hazards to third parties with BT/Openreach services from transferred potentials in the ROEP zone of an electricity substation. Figure 1 illustrates how a transferred potential hazard may arise and Figure 2 illustrates ROEP contours at a hypothetical substation.

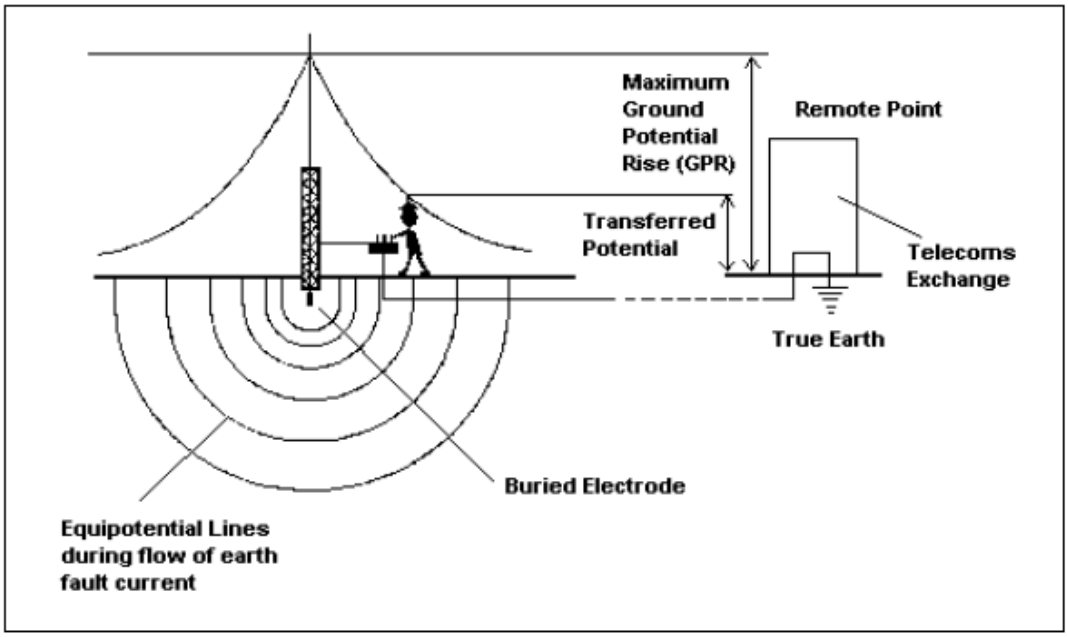
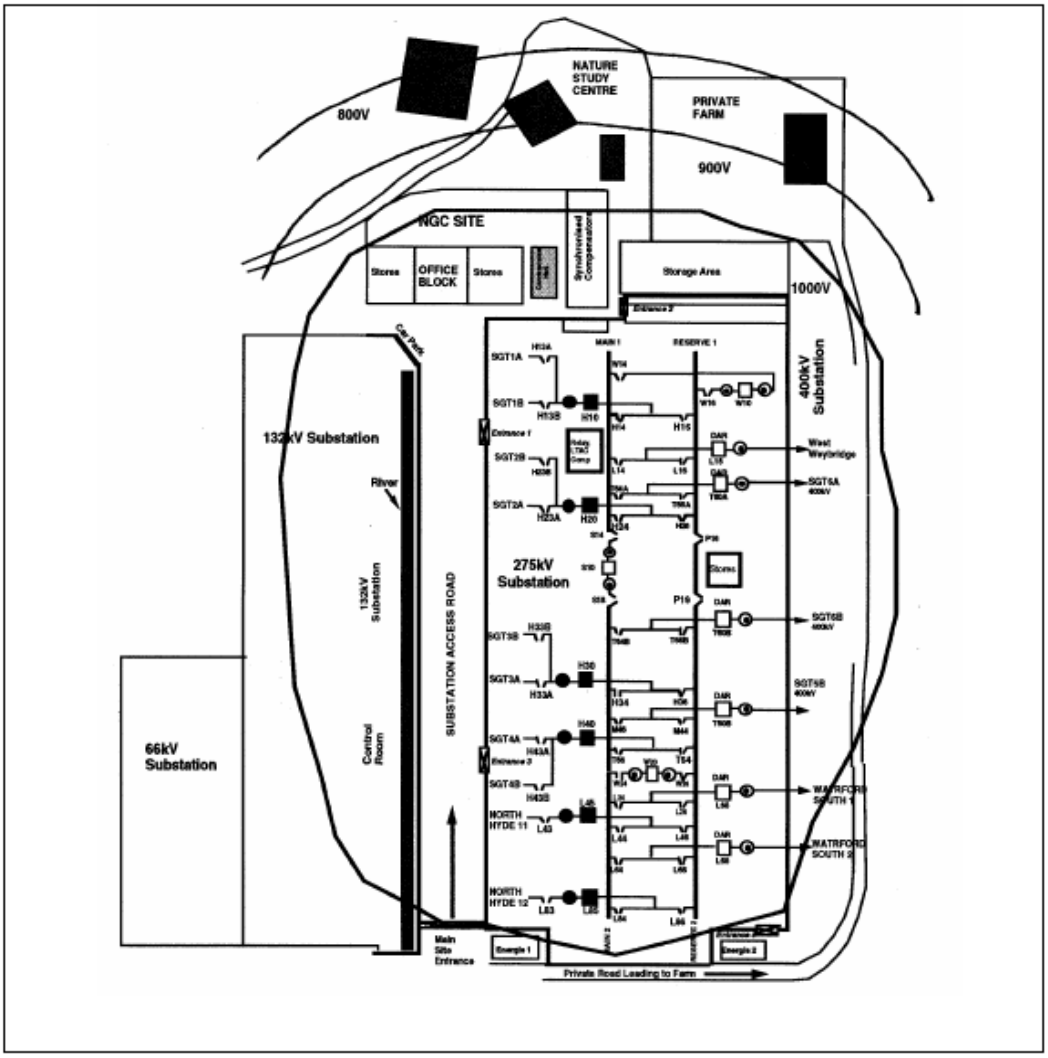


Figure 1 – Illustration of transferred potential hazard within ROEP zone



NOTE: The ROEP contours shown should not be taken as representative of any particular substation.

Figure 2 – Plan view of hypothetical substation illustrating ROEP contours

This EREP considers the hazard to persons arising from electric shock. Secondary risks associated with electric shock, i.e. falls are not considered.

This EREP does not consider risks to BT/Openreach operators working on services within the ROEP zone. These risks are addressed in a ENA EREP 128 [N6].

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

IEEE Standard 80, *Guide for safety in AC substation grounding*

IEC 60479-1, *Effects of current on human beings and livestock – Part 1: General aspects*

BS 7671, *Requirements for Electrical Installations. IET Wiring Regulations*

BS EN 60664-1, *Insulation coordination for equipment within low-voltage systems. Principles, requirements and tests*

BS EN 60950-1, *Information technology equipment. Safety. General requirements*

BS EN 50522, *Earthing of power installations exceeding 1 kV a.c*

Other publications

[N1] ITU-T Directives Volume VI, *Directives concerning the protection of telecommunication lines against harmful effects from electric power and electrified railway lines - Volume VI: Danger, damage and disturbance* (2008)

[N2] Statutory Instrument 1999 No. 3242, *The Management of Health and Safety at Work Regulations 1999*

[N3] ENA EREC S37, *Code of practice for the safe working on pilot, auxiliary and communication cables*

[N4] ENA EREC S36, *Identification and recording of 'hot' sites - joint procedure for Electricity Industry and Communications Network Providers Electricity Association*

[N5] ENA TS 41-24, *Guidelines for the Design, Installation, Testing and Maintenance of Main Earthing Systems in Substations*

[N6] ETR128, *Risk assessment for communication network operatives working in a ROEP zone*

[N7] Statutory Instrument 2003 No. 2553, *The Electronic Communications Code (Conditions and Restrictions) Regulations 2003*

[N8] HSE publication, *Reducing Risks, Protecting People*, 2001, ISBN 0717621510

3 Terms and definitions

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

3.1
D_f
Decrement factor

3.2
Communications Network Provider (CNP)
company installing fixed-line communications apparatus under the Electronic Communications Code Regulations [N7]