

BS 6867:2013



BSI Standards Publication

Maintenance of electrical switchgear and controlgear for voltages above 36 kV – Code of practice

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Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under license from the British Standards Institution and came into effect on 30 September 2013. It was prepared by Subcommittee PEL/17/1, *High-voltage switchgear and controlgear*, under the authority of Technical Committee PEL/17, *High-voltage switchgear and controlgear and HV-LV co-ordination*. A list of organizations represented on these committees can be obtained on request to their secretary.

Supersession

This British Standard supersedes BS 6867:1987, which is withdrawn.

Information about this document

This is a full revision of the standard, and introduces the following principal changes.

- The various types of maintenance approach are discussed, including preventative and condition based maintenance.
- Maintenance policies using PAS 55 philosophy have been introduced.
- Maintenance considerations for modern plant and equipment, like gas insulated switchgear (GIS) and capacitive charged motor drive mechanisms, have been added.
- The standard has been restructured to create a dedicated clause on mechanisms (Clause 31).
- Text on use and handling of sulphur hexafluoride has been brought up to date.
- Recommendations for hard-gas interrupters are not given.

The purpose of this British Standard is to provide, in a convenient form, recommendations and guidance on those matters which technical knowledge and experience have shown to be important in keeping electrical switchgear and controlgear in an acceptable condition. It is intended for the guidance of those actually carrying out the maintenance work, as well as for administrative personnel.

The normally quiescent state of electrical switchgear and some controlgear does not automatically draw attention to incipient faults, deterioration or danger resulting from neglect and the consequent need for maintenance. It follows, therefore, that an organized system of maintenance is important to facilitate continued safe and acceptable operation of an electrical system with the minimum risk of failure and consequent interruption of supply.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Hazard warnings

WARNING. Older switchgear might contain asbestos. Attention is drawn to the Control of Asbestos Regulations 2012.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

In particular attention is drawn to the statutory regulations listed in Annex A.

Section 1: General

1 Scope

This British Standard gives recommendations and guidance for the maintenance of electrical switchgear and controlgear having a rated a.c. or d.c. voltage above 36 kV.

NOTE This standard is not applicable to explosion protected switchgear and controlgear. Inspection and maintenance of electrical apparatus in explosive gas atmospheres is covered in BS EN 60079-17.

2 Normative references

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

BS 6423:1983+A1:1992, *Code of practice for maintenance of electrical switchgear and controlgear for voltages up to and including 1 kV*

BS EN 13306:2010, *Maintenance – Maintenance terminology*

BS EN 50110-1:2013, *Operation of electrical installations – Part 1: General requirements*

BS EN 60422, *Mineral insulating oils in electrical equipment – Supervision and maintenance guidance*

BS EN 60480, *Guidelines for the checking and treatment of sulphur hexafluoride (SF₆) taken from electrical equipment and specification for its re-use*

PD CLC/TR 62271-303, *High voltage switchgear and controlgear – Part 303: Use and handling of sulphur hexafluoride (SF₆)*

3 Terms and definitions

For the purposes of this British Standard the terms and definitions given in BS EN 13306:2010, BS EN 50110-1:2013 and the following apply.

3.1 acceptable condition

condition in which an item is able to meet the requirements of the relevant specification and perform its required functions

3.2 controlgear

a general term covering switching devices and their combination with associated control, measuring, protective and regulating equipment, also assemblies of such devices and equipment with associated interconnections, accessories, enclosures and supporting structures, intended in principle for the control of electric energy consuming equipment [IEC 60050-441:1984+A1, **441-11-03**]

3.3 dead working

work activity on electrical installations, which are neither live nor charged, carried out after having taken all measures to prevent electrical danger [BS EN 50110-1:2013, **3.4.8**]

3.4 diagnostic test

comparative measurement carried out to monitor the condition of an item

3.5 examination

inspection with the addition of partial dismantling as required, supplemented by means such as measurement and non-destructive tests in order to arrive at a reliable conclusion as to the condition of an item

3.6 failure

termination of the ability of an item to perform a required function
[BS EN 13306:2010, 5.1]

NOTE Failure can be gradual or sudden and partial or complete.

3.7 high voltage

voltage in excess of 1 kV

3.8 inspection

examination for conformity by measuring, observing, or testing the relevant characteristics of an item [BS EN 13306:2010, 8.1]

3.9 item

part, component, device, subsystem, functional unit, equipment or system that can be individually described and considered [BS EN 13306:2010, 3.1]

3.10 live working

all work in which a worker deliberately makes contact with live parts or reaches into the live working zone with either parts of his or her body or with tools, equipment or devices being handled [BS EN 50110-1:2013, 3.4.4]

3.11 low-maintenance equipment

equipment designed not to require frequent maintenance and, except when subject to very frequent operation, intended to need minimal examination or overhaul during the economic life of the equipment

3.12 maintenance

combination of actions carried out to retain an item in, or restore it to, an acceptable condition

3.13 manufacturer's handbook

written information issued by the manufacturer of the equipment which includes guidance and instructions concerning installation, commissioning, operation and maintenance of the equipment

3.14 non-routine maintenance

unplanned maintenance which is not the result of a failure

3.15 operational check

action carried out to determine whether an item functions correctly

3.16 overhaul

comprehensive set of preventive maintenance actions carried out in order to maintain the required level of performance of an item

NOTE 1 Overhaul may be performed at prescribed intervals of time or number of operations.

NOTE 2 Overhaul may require a complete or partial dismantling of the item.

[BS EN 13306:2010, 8.6]

3.17 post-fault maintenance

maintenance which might be necessary after a specified number of fault clearance or making operations