AS 2067—1984

Australian Standard®

Switchgear assemblies and ancillary equipment for alternating voltages above 1 kV

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PREFACE

This edition of this standard was prepared by the Association's Committee on Power Switchgear as a revision of AS 2067—1980. Revision of AS 2067—1980 was necessary in order to harmonize its requirements with those of AS 2650—1983, High Voltage A.C. Switchgear and Controlgear—Common Requirements, and Clauses 1 to 5 of this standard correspond to Clauses 1 to 5 of that standard.

Reference has been made to AS 1852, Chapter (441) for a number of terms to make their definitions conform to those in International Electrotechnical Vocabulary.

The changes in this edition are as follows:

(a) Clause 5.1.12 requires voltage transformers, as appropriate, to comply with AS 1243 and the primary connections thereto are required to be capable of carrying the maximum fault current for the operating time of the protection.

(b) Clauses 5.1.14 and 7.5 require exposed terminals of control wiring to be shrouded where nominal voltages to earth exceed 32 V a.c. or 115 V d.c.

(c) Table 9.1 has been amended to delete rated voltages and impulse withstand voltages not specified in AS 2650 and some of the clearances specified in Table 10.1 have been deleted to line up with amended Table 9.1.

(d) Clause 10.4 has been amended to cover both fences and solid walls for restriction of entry to outdoor installations.

(e) The calculation of conductor size in the design of the earth electrode system, see Appendix C, has been amended to provide for the determination of cross-sectional area on the basis of fault current and its duration, conductor material and temperature rise, and a decrement factor taking into consideration the system $\frac{X}{R}$ is used to determine the symmetrical fault current level used in the calculation.

(f) Irregularity factor K_i, in the formula for calculation of allowable touch voltage in earthing systems in Appendix C has been amended.

(g) The circuit and wire identification code lettering and the typical application shown in Appendix D have been amended to conform with AS 1103, Part 6.

(h) Appendix F gives revised recommendations regarding creepage distances.

(j) Many minor amendments have been made throughout this standard to clarify the meaning of clauses in AS 2067—1980.

The referenced and relevant documents as shown in the Annex have been updated and references inserted covering the determination of comparative tracking indices, installation and maintenance of batteries in buildings and fire protection and recommendations for creepage distances.

This standard coordinates the requirements for indoor and outdoor switchgear assemblies for alternating voltages above 1 kV, such as are employed in connection with the generation, transmission and distribution of electric power. It also applies to the ancillary equipment used in conjunction with the switchgear.

In particular, this standard specifics requirements in regard to electrical clearances, the safety of personnel during normal operation and maintenance of the equipment, the earthing of main circuits, substations and fences. Basic requirements are specified for busbars, marking and identification of conductors and terminals, colours of indicator lights and electrical and compressed air auxiliary systems.

The appendices include information to be given with enquiry and order, recommendations for the jointing of busbars and connections, recommendations for the design of earthing systems, a typical system for functional identification of small wiring and recommendations for the design of compressed-air systems.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
SWITCHGEAR ASSEMBLIES AND ANCILLARY EQUIPMENT FOR ALTERNATING VOLTAGES ABOVE 1 kV

1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies the requirements for indoor and outdoor switchgear assemblies for alternating voltages above 1 kV such as are employed in connection with the generation, transmission and distribution of electric power. It also applies to the ancillary equipment used in conjunction with the switchgear.

It is not intended to cover the requirements for specific apparatus for which separate Australian standards may exist (see Clause 1.3), nor the additional requirements for switchgear for use in mines and explosive atmospheres.

It does not give any recommendations for environmental requirements, but these should be taken into consideration in the siting of the installation.

1.2 APPLICATION. This standard should be read in conjunction with AS 2650.

1.3 REFERENCED AND RELEVANT DOCUMENTS. A list of documents referred to in this standard is given in the Annex. A list of standards not referred to but which may be relevant to this standard is also given in the Annex.

2. SERVICE CONDITIONS

Clause 2 of AS 2650 applies.

This standard applies to high voltage switchgear suitable for use on systems described in AS 1824, Part 1.

3. DEFINITIONS

3.1 APPLICATION. For the purposes of this standard, the relevant definitions in AS 1852 (441), AS 2086, AS 2263 and in Clause 3 of AS 2650 apply. Additional terms used in this standard are defined below.

3.2 GENERAL TERMS.

3.2.1 Switchgear and 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.

3.3 TYPES OF SWITCHGEAR.

3.3.1 Open-type switchgear—switchgear in which the live parts are not provided with protective cover.

3.3.2 Enclosed-type switchgear—switchgear in which all components are within a casing which may be of metal or insulating material.

3.3.3 Cellular-type switchgear—switchgear in which the component parts of the main electrical circuit are assembled together in a separate compartment or cell, with or without subdividing barriers, the cell being integrated with the building fabric.

3.4 ENCLOSURES.

3.4.1 Kiosk—a weatherproof enclosure which may contain switchgear, transformer, control, terminal equipment, etc, but which has little or no internal operating space or passageway for occupation by an operator.

3.5 TYPES OF CONTROL PANELS.

3.5.1 Control panel—a self-contained assembly which may be part of the switchgear equipment or may be separately located, comprising apparatus or devices for one or more of the following duties: operation, control, measurement and protection.

3.5.2 Control board—an assembly of panels separately located from the associated switchgear on which are mounted control and indicating devices.

NOTE: Control boards other than those associated with circuit-breakers may be designated according to their applications, e.g. motor control board, boiler control board.

3.5.3 Metering panel—a self-contained assembly, which may be part of the switchgear equipment or may be separately located, on which is mounted tariff or statistical metering equipment.

3.5.4 Metering board—an assembly of panels separately located from the associated switchgear on which are mounted tariff or statistical metering equipment.

3.5.5 Relay board—an assembly of panels separately located from the associated switchgear on which are mounted relays associated with protection and operation.

3.6 BUSBARS.

3.6.1 Busbar—a relatively short conductor forming a common junction between a number of circuits connected separately thereto.

3.6.2 Busbar connection—a conductor that forms the electrical connection between a busbar and an individual piece of apparatus that is within reasonable proximity.

3.6.3 Open busbar—a busbar that is not provided with a protective cover.

3.6.4 Enclosed busbar—a busbar that is contained in a duct or casing of any material.

3.6.5 Outdoor busbar - an open busbar or an enclosed busbar designed for use entirely out of doors.

3.6.6 Indoor busbar—an open busbar or an enclosed busbar designed for use entirely indoors.

3.6.7 Air-insulated busbar—a busbar which, except at points of support, is designed with air at atmospheric