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Australian Standard 3007, Part 3—1982

1987 ed

ELECTRICAL INSTALLATIONS FOR OUTDOOR SITES UNDER HEAVY CONDITIONS (INCLUDING OPEN-CAST MINES AND QUARRIES)

Part 3—GENERAL REQUIREMENTS FOR EQUIPMENT AND ANCILLARIES

3007 Part 3—1987 **General requirements for equipment and ancillaries**
A4 12pp *D*

Specifies general requirements for the equipment and ancillaries associated with the electrical installation. Sections deal with electrical components, rotating machines, transformers, static converters, switching devices, cable selection and application, cable connectors, cable drums, control circuits and control devices, safety circuits and safety devices, and fire detection and protection systems. Technical equivalent to IEC 621-3.

*Committee EL/33. **Supersedes AS 3007.3—1982**; Draft for comment DR 85326. **Publication date** 1987-05-04; ISBN 0 7262 4615 8.*

STANDARDS ASSOCIATION OF AUSTRALIA
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THE FOLLOWING SCIENTIFIC, INDUSTRIAL, AND GOVERNMENTAL ORGANIZATIONS and departments were officially represented on the committee entrusted with the preparation of this standard:

Australasian Institute of Mining and Metallurgy

Australian Electrical and Electronic Manufacturers Association

Confederation of Australian Industry

Consulting Engineers

Department of Mineral Resources, N.S.W.

Department of Mines, Qld

Electricity Supply Association of Australia

Joint Coal Board

Mines Department, Tas.

Mining interests

EL/33

This standard, prepared by Committee ET/1, Electrical Installations for Outdoor Sites Under Heavy Conditions (Including Open-cast Mines and Quarries), was approved on behalf of the Council of the Standards Association of Australia on 4 February 1982, and was published on 15 June 1982.

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AUSTRALIAN STANDARD

ELECTRICAL INSTALLATIONS FOR OUTDOOR SITES UNDER HEAVY CONDITIONS (INCLUDING OPEN-CAST MINES AND QUARRIES)

PART 3 GENERAL REQUIREMENTS FOR EQUIPMENT AND ANCILLARIES

AS 3007, Part 3—1982

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PREFACE

This standard was prepared by the Association's Committee on Electrical Installations for Outdoor Sites Under Heavy Conditions (Including Open-cast Mines and Quarries).

It constitutes Part 3 of AS 3007 and is essentially identical with IEC 621-3 which was prepared by the corresponding IEC Technical Committee, i.e. TC 71. Points of difference from the IEC standard are highlighted by means of a marginal bar.

The counterpart Australia committee (ET/1) has actively participated in the work of IEC TC 71 which has as its objective the development of uniform and internationally acceptable rules for the safe use of electricity in open-cast mines, quarries, stockpiles and the like. Such applications present particularly onerous conditions for the electrical apparatus and systems, including continual alteration of the location of the apparatus and systems, extension of the operational area, and adverse environmental conditions. Because of the size of the plant and the need for mobility, supply is frequently at high voltage over long distances, by means of trailing cables. This should be compared with other industries where the electrical installations are generally fixed.

The composite standard prescribes requirements for the installation and operation of electrical apparatus and systems in the abovementioned locations, with the object of ensuring the safety of persons, livestock and property. AS 3007, Part 1 outlines the scope of the composite standard and provides definitions for some of the terms used. AS 3007, Part 2 specifies the measures which are required for protection against electric shock in normal service from direct contact with live parts; for protection against electric shock from parts which may become live in the event of a fault (indirect contact); and for protection against the effects of overcurrent resulting from overload or short circuit conditions. This standard (AS 3007, Part 3) prescribes general requirements for the equipment and ancillaries associated with the electrical installation.

The standard recognizes several types of power supply system and prescribes the protective measures which are necessary for each system. Requirements for the protection of personnel from indirect contact (Section 2 of AS 3007, Part 2) are based on the concept of permissible voltage versus time limits, which take into account the pathophysiological effects of electric current passing through the human body, the typical industry conditions, and the probability of personnel being in contact with the plant. In this and other respects the standard differs in approach from the practically evolved rules of AS 3000, SAA Wiring Rules.

It will therefore be necessary for the statutory authorities concerned to clearly delineate the respective areas of application for this standard and for AS 3000.

IEC TC 71 is continuing the development of further parts of IEC 621, and consideration will be given to the issue of additional parts of this Australian standard when the corresponding IEC publications become available.

The standard may require reference to the following Australian and IEC standards:

AS 1081	Methods of Measurement of Airborne Noise Emitted by Rotating Electrical Machinery
AS 1217	Methods of Measurement of Airborne Sound Emitted by Machines
AS 2279	Disturbances in Mains Supply Networks Part 2—Limitation of Harmonics Caused by Industrial Equipment
AS 2380	Electrical Equipment for Explosive Gas Atmospheres—Explosion Protection Techniques Part 1—General Requirements
AS 3007	Electrical Installations for Outdoor Sites Under Heavy Conditions (Including Open-cast Mines and Quarries) Part 2—General Protection Requirements Part 4—Requirements for the Installation* Part 5—Operating Requirements*
IEC 502	Extruded Solid Dielectric Insulated Power Cables for Rated Voltages from 1 kV Up to 30 kV

*In course of preparation

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
ELECTRICAL INSTALLATIONS FOR OUTDOOR SITES UNDER HEAVY CONDITIONS (INCLUDING OPEN-CAST MINES AND QUARRIES)

PART 3. GENERAL REQUIREMENTS FOR EQUIPMENT AND ANCILLARIES

SCOPE OF PART

This standard sets out requirements for the equipment and ancillaries associated with electrical installations within the scope of AS 3007, Part 1.

SECTION 1. GENERAL REQUIREMENTS FOR ELECTRICAL COMPONENTS

INTRODUCTION. In this Section, the general requirements for all components are described and the specific requirements for various components are included in subsequent Sections.

1 DESIGN AND SELECTION. Design and selection of components shall be on the basis of expected loading, operating characteristics and cyclic duty taking into consideration the protection required in special and arduous environmental, operational, transportation and storage conditions.

Some of these conditions, such as the ones listed below, may differ from those given in other Australian or IEC standards. Typical values in Australian and IEC standards are given in parentheses below:

—high altitude (0 to 1 000 m);
—low and/or high ambient temperature (0 to 40° C);
—supply voltage variations (± 5%);
—supply frequency variations (± 3%);
—insecure power supply and transients;
—high or low humidity;
—environment, e.g. dust, wind pressure, marine atmosphere;
—flammable and/or explosive materials and/or atmosphere;
—vermin, including rodents or other small animals;
—localities prone to natural catastrophes;
—ecological impact.

In order to ensure that correct design parameters are selected, mutual agreement shall be reached between the user and the supplier as to the quantitative and/or qualitative conditions.

2 RELEVANT STANDARDS. The electrical specifications of all components shall be not less than that required by the relevant Australian or IEC standards.

3 MATERIALS. Materials used in component construction shall be appropriate for the environmental conditions, including temperature, altitude, moisture, etc.

4 PROTECTION. Protection shall be provided against damage and/or overheating during normal operation or in expected fault conditions.

5 OPERATING CONDITIONS. Components shall be designed to meet such conditions as vibration, acceleration, deceleration, slewing and angles of inclination (tilting and mounting) which may occur under expected operational conditions.

6 SITE CONDITIONS. Components shall be installed so that design features such as cooling systems shall not be impaired by external factors such as position, blocking of ventilation ducts, hostile environment, etc.

7 COMBUSTIBLE MATERIALS. If combustible material (e.g. dust or liquid) is present in such quantity as to create a hazard and contact is possible between any