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Australian Standard 3007, Part 1—1982

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

Part 1—SCOPE AND DEFINITIONS

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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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

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AUSTRALIAN STANDARD

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

Part 1 SCOPE AND DEFINITIONS

AS 3007, Part 1—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 1 of AS 3007 and is technically identical with IEC 621-1 which was prepared by the corresponding IEC Technical Committee, i.e. TC 71. It differs from the IEC publication, mainly in the inclusion of certain additional definitions, viz Clauses 3.48 to 3.53. Points of difference from the IEC publication are highlighted by means of a marginal bar. Acknowledgement is made of the assistance obtained from the IEC publication.

Australia was instrumental in the formation of IEC TC 71 and has held the responsibility for the Secretariat of the IEC committee since its inception in 1970.

The counterpart Australian 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. This standard (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. 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 the Australian standard when the corresponding IEC publications become available.

This standard may require reference to the following Australian standard:

AS 1852 International Electrotechnical Vocabulary.

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STANDARDS ASSOCIATION OF AUSTRALIA

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

PART 1—SCOPE AND DEFINITIONS

1 SCOPE. This standard (including other published Parts of AS 3007) is applicable to the installation and operation of electrical equipment associated with outdoor sites under heavy conditions, including open-cast mines and quarries, and which are used for—

(a) winning, stacking and primary processing machinery;

(b) secondary processing machinery;

(c) transport conveying systems;

(d) pumping and water supply systems;

(e) movable railway systems;

(f) fixed railway systems (operations only);

(g) haulage trucks;

(h) power generating and distribution equipment;

(j) control, signal, supervisory and communication systems; and

(k) ancillaries.

NOTE: This standard does not cover temporary and provisional places of work in the open, such as building sites and earth-moving sites, unless the equipment used is similar to that used in surface mining applications.

2 OBJECT. This object of this standard is to set out basic principles for the installation and operation of electrical equipment so as to ensure safety of persons, livestock, property and the proper functioning of the plant.

3 DEFINITIONS. The following definitions apply for the purposes of this standard. They may be amended or supplemented according to later work on the subsequent parts of this standard.

For the definitions of other terms, reference should be made to AS 1852 and to Australian standards or IEC publications dealing with the particular subjects concerned.

In the following definitions the terms 'Safety' and 'Protection' are to be interpreted as follows:

(a) The term 'Safety' is used in a broad sense covering the safety of persons, livestock and property. In this respect the safety of property also includes those cases where safety depends on continuity of supply.

(b) The term 'Protection' is also used in a broad sense covering all measures and actions taken to protect against or prevent injury. It also includes all equipment used in connection with these measures—serving its purpose of assuring the safety of persons, livestock and electrical equipment.

3.1 Electrical installation—any combination of interconnected electrical equipment within a given space or location.

3.2 Electrical equipment—any item used for such purposes as generation, conversion, transmission, distribution or utilization of electrical energy such as machines, transformers, apparatus, measuring instruments, protective devices, wiring material and appliances.

3.3 Open-cut or open-cast mine—an open air site for the extraction of materials or minerals, such as coal, bauxite, iron ore, etc.

3.4 Quarry—an open air site for the extraction of materials such as limestone, gravel, clay, etc.

3.5 Operations (electrical)—the process of performing work through the controlled application of electrical power. This process includes—

Operating: which means switching, adjusting, controlling and supervision;

Servicing: which means maintenance, alterations, removal of faults and testing.

3.6 Operating area—an area accessible to operating personnel in the normal performance of their duties.

3.7 Electrical operating area—an area accessible only by the opening of a door or the removal of a barrier. The area shall be clearly and visibly marked by appropriate signs.

3.8 Closed electrical operating area—an area accessible only through the use of a tool or key. The area shall be clearly and visibly marked by appropriate signs.

3.9 Working level (bench)—that part of an open-cut mine or quarry on which machinery and/or rolling stock are in operation. The working level and/or working area may change location with the progress of operations.

3.10 Winning and stacking machinery. Winning and stacking machines are used in the process of uncovering or detaching materials from the earth's surface or stacking such material. These machines are designed to be able to change location according to operational requirements.

They include the following:

(a) excavators, namely bucket-wheel excavators, bucket-chain excavators, draglines, shovels and other excavators, reclaimers, ditch bunker loaders, etc;

(b) spreaders and stackers;