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SELECTION, INSTALLATION AND MAINTENANCE OF ELECTRICAL APPARATUS AND ASSOCIATED EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES
(Other than Mining Applications)

Part 8 — APPARATUS WITH TYPE OF PROTECTION ‘s’ — SPECIAL PROTECTION

The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Associated Chambers of Manufactures of Australia

Australian Coal Association

Australian Electrical Manufacturers Association

Department of Defence

Department of Productivity

Department of Public Works, N.S.W.

Electrical Contractors Associations of Australia

Electricity Supply Association of Australia

Insurance Council of Australia

Oil Companies

State Departments of Explosives

State Departments of Labour and Industry

State Departments of Mines

Statutory Electricity Authorities

Sydney County Council (Testing Interest)

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Part 8 — APPARATUS WITH TYPE OF PROTECTION 's' — SPECIAL PROTECTION

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PREFACE

This standard was prepared by the Association's Committee on Electrical Equipment in Hazardous Locations for the guidance of manufacturers, users and statutory authorities, and for use with the SAA Wiring Rules and relevant Mining Regulations.

This standard is one of a number of Parts of a code which deals with the classification of hazardous areas, and the selection, installation and maintenance of electrical apparatus for use in areas where combustible materials are generated, processed, handled or stored and which therefore are potentially hazardous. Each Part applies to the installation and maintenance requirements appropriate to one of the types of protection which may be used to achieve electrical safety, and outlines basic requirements and considerations which are fundamental to the use of electrical apparatus in hazardous areas and which therefore provide the basis for the other Parts of the standard.

The full list of Parts is as follows:

Part 1 — Basic Requirements*
Part 2 — Classification of Hazardous Areas*
Part 3 — Apparatus with Type of Protection 'd' — Flameproof Enclosure
Part 4 — Apparatus with Type of Protection 'i' — Intrinsically Safe Apparatus and Systems*
Part 5 — Apparatus with Type of Protection 'p' — Pressurization and Continuous Dilution
Part 6 — Apparatus with Type of Protection 'e' — Increased Safety*
Part 7 — Apparatus with Type of Protection 'n'*
Part 8 — Apparatus with Type of Protection 's' — Special Protection*
Part 9 — Apparatus with Type of Protection 'o' — Oil–immersed Apparatus and Apparatus with Type of Protection 'q' — Sand–filled Apparatus
Part 10— Installation and Maintenance Requirements for Electrical Apparatus for Use with Combustible Dusts
Part 11— Specific Industry Applications
Part 12— The Use of Gas Detectors
Part 13— Installation and Maintenance Requirements for Instrumentation.

In the terminology, definitions and general treatment of the subject account has been taken of a similar draft standard code of practice issued by the British Standards Institution, viz Doc 75/20875 DC Part 8 — Installation and Maintenance Requirements for Electrical Apparatus with Type of Protection 's', and acknowledgment is made of the assistance received therefrom.

The standard requires reference to the following standards:

AS 1826 Special Protection of Electrical Equipment for Explosive Atmospheres
AS 3000 Part 1, SAA Wiring Rules.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard Code of Practice or the SELECTION, INSTALLATION AND MAINTENANCE OF ELECTRICAL APPARATUS AND ASSOCIATED ELECTRICAL EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES (Other than Mining Applications)

PART 8 — APPARATUS WITH TYPE OF PROTECTION 's' — SPECIAL PROTECTION

FOREWORD

This Part of the Code should be read in conjunction with the other Parts, particularly Parts 1 and 2 which taken together describe the fundamental considerations which affect the selection, installation and maintenance of all electrical apparatus used in hazardous areas.

The code is based on the concept, which is accepted internationally, of dealing with the risk of fire and explosion by area classification. This concept recognizes the differing degrees of probability with which explosive (flammable) concentrations of combustible material may arise in installations in terms of both the frequency of occurrence and the probable duration of existence on each occasion.

The detailed considerations which must be taken into account are described in Part 2 of the code. For completeness and for the convenience of readers, the definitions appropriate to area classification are repeated here. It should be noted that whereas formerly classified areas were known as 'divisions', they are now called 'zones'. Three sets of conditions are recognized, viz:

Zone 0 — in which an explosive gas/air mixture is continuously present or present for long periods.

Zone 1 — in which an explosive gas/air mixture is likely to occur in normal operation.

Zone 2 — in which an explosive gas/air mixture is not likely to occur, and if it occurs it will only exist for a short time.

It should be noted that this concept of area classification deals only with risks due to combustible gas and vapours, and by implication mists. It does not deal with combustible dusts, which may lie quiescent for long periods of time until disturbed into suspension by a suitable mechanism.

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By implication, an area which is not classified as Zone 0,1 or 2 is deemed to be a non-hazardous or safe area. If doubt exists as to the classification of an area which is judged to be hazardous or potentially hazardous, guidance should be sought at an early stage from the authority having jurisdiction in the industry or area concerned (see Parts 1 and 2).

Electrical apparatus used in each of the classified zones must be suitably protected by design and manufacture, and must also be installed and maintained so as to ensure its safe use. The code, which offers guidance in the selection, installation and maintenance of suitably protected apparatus, should be applied to all new installations. It should also be applied to changes to existing installations, though it is recognized that minor changes only to certain existing installations may need to be made.

Notwithstanding application of the installation recommendations of this code to existing installations, the recommendations for maintenance should be applied to all electrical apparatus and installations, irrespective of age and date of installation. It should also be noted that the installation and maintenance recommendations described in the code are supplementary and not alternative to AS 3000, Part 1, SAA Wiring Rules.

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SECTION 1. GENERAL

1.1 SCOPE. This Part of the code offers guidance in the selection, installation and maintenance in Class 1 hazardous areas of electrical apparatus which is certified or assessed in accordance with the requirements of Type of Protection 's': Special Protection. (For relevant specifications, see Rule 1.4.)

It should be noted that the recommendations of the code do not apply to the underground mining industry, where other precautions are necessary, though it is recognized that the recommendations of the code may be applied to certain parts of the surface mining industries.

For the purposes of this Part of the code, explosion risks due to the presence of combustible gases and vapours only are considered. Combustible dusts are therefore excluded, except were otherwise noted (see also Part 10).

1.2 DEFINITION. For the purpose of this Part of the code, the following definition applies:

1.2.1 Type of Protection 's': Special Protection — a concept which has been adopted to permit the certification of those types of electrical apparatus which, by their nature, do not comply with the constructional or other requirements specified for apparatus with established types of protection, but which nevertheless can be shown, where necessary by test, to be suitable for use in hazardous areas, in prescribed zones.

The concept, therefore, permits flexibility on the part of certifying and assessing authorities in their approach to applications for certification or assessment of apparatus, the use of which would otherwise not be permitted in hazardous areas on account of non-compliance with the requirements of standards for recognized or established types of protection. This applies not only to current types of apparatus, but also allows flexibility of approach to new designs and innovatory ideas, the development of which might otherwise be hindered.

NOTE: The zone or zones in which apparatus with special protection may be used will be determined by a comparison of the safety measures which have been adopted in the design and manufacture of the apparatus with those used to ensure the safety of apparatus having other established types of protection, and for which the permitted zones of use have been agreed (see also Section 2 of Part 1, and Paragraph A6 in Appendix A of this Part).

1.3 DESCRIPTION OF TECHNIQUE.

1.3.1 General. In the absence of detailed specifications for apparatus with Type of Protection 's', it is not possible to provide a detailed description of the technique. More accurately there is no single technique, but rather a concept which may embrace an unspecified number of individual techniques which are not themselves adequately described by specifications for the established types of protection. The examples given in Clauses 1.3.2 to 1.3.4 illustrate the types of apparatus which may be certified within the concept of Type of Protection 's', and the measures which have been adopted to ensure safety in some cases.

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