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AS 3760—1990

Australian Standard®

In-service safety inspection and testing of electrical equipment

STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee EL/36, In-Service Testing of Electrical Equipment. It was approved on behalf of the Council of Standards Australia on 13 December 1989 and published on 7 May 1990.

The following interests are represented on Committee EL/36:

Air Conditioning Council of Australia

Australian Electrical and Electronic Manufacturers Association

Building Industry Specialist Contractors Organization of Australia

Confederation of Australian Industry

Department of Industrial Relations and Employment NSW

Electrical Contractors Associations of Australia

Electrical Trades Union of Australia

Public Works Department NSW

Regulatory Authorities (Electrical)

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This Standard was issued in draft form for comment as DR 88050.

STANDARDS AUSTRALIA

19 APR 1991
SYDNEY INFO. CENTRE

Amendment No 1
to
AS 3760—1990
In-service safety inspection and testing of electrical equipment

REVISED TEXT

The 1990 edition of AS 3760 is amended as follows; the amendment should be inserted in the appropriate place.

SUMMARY: This Amendment applies to Clause 2.4.7.

Published on 15 April 1991.

AMDT No 1 APR. 1991

Page 8. Clause 2.4.7

In the 2nd paragraph, *delete* existing 100 ms requirement in Item (b) and *insert* 300 ms.

This amendment forms part of the Specification on publication.

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PREFACE

This Standard was prepared by the Standards Australia Committee on in-service testing of electrical equipment, in response to requests for guidance to employers, owners and users of equipment who all need to conduct in-service testing for equipment safety.

Such in-service testing is necessary for the safety of persons using the equipment and for the proper discharge of the obligations of employers and employees, as listed in the State legislations covering occupational health and safety matters. This Standard specifies in-service safety inspection and testing protocols and criteria that satisfy these obligations and provides an approach to safety which is cost effective without jeopardizing personnel safety or involving excessive equipment downtime.

During preparation of this first edition of this Standard, the Committee was aware—

(i) of the urgent need for uniform inspection and testing requirements that could be adopted on a national basis by Australian industries and authorities;

(ii) that specification of relatively simple inspection and testing requirements that could be conducted at reasonable intervals, by appropriately trained personnel using readily available testing equipment would be certain to gain wider acceptance and lead to very much improved and cost effective safety practices; and

(iii) that opportunity could be taken to amend, quickly, the requirements (i.e. reduce or extend) in light of experience gained during application of this first edition.

The in-service safety inspection and testing requirements in this Standard do not cover testing for design and approval of equipment (which is covered separately in the AS 3100 and AS 3300 series of Standards) or the comprehensive testing to be conducted by specialized repair personnel, e.g. licenced repair agents, (which is intended to be included in a separate standard currently under development).

For the reasons outlined above, this edition of this Standard has incorporated only the minimum of electrical tests and has placed considerable emphasis on regular and comprehensive visual inspectons. However, depending on experience with the application of the Standard, consideration will be given to extending future editions to include more comprehensive electrical tests (e.g. leakage current test, high current earthing conductor tests).

Finally, it should be noted that requirements for repair of faulty equipment and the more comprehensive electrical testing to be conducted, by personnel with specialized training, prior to the return of repaired equipment are not included in this Standard. Requests for development of a new Standard to cover such testing are under consideration.

In the preparation of this Standard, reference was made to material previously published by the State Electricity Commission of Victoria, Department of Industrial Relations and Employment (NSW), Victorian Occupational Health and Safety Commission, and Telecom Australia (Building Engineering Section). Grateful acknowledgement is made of the assistance from those sources.

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FOREWORD

The following items are all necessary for the safe use of electrical equipment:

(a) The equipment needs to be designed and manufactured to appropriate safety standards.

(b) Each item of equipment needs to be subjected to routine inspection and testing to detect damage, wear, or other conditions which might render it unsafe.

(c) Equipment identified as faulty needs to be withdrawn from service and referred for repair or disposal by expert personnel.

(d) Appropriate equipment needs to be used for each particular application.

(e) In specific cases, e.g. for use in confined spaces, equipment also needs to be used in accordance with an appropriate set of rules linking the type of work with the class of equipment and environmental safety facilities.

As indicated in the Preface, this Standard confines itself to the matters in Item (b), i.e. specifying inspection requirements and non-destructive tests that can be reasonably carried out to monitor the safety of the equipment.

The following basic rationale provides some insight and background to the inspection and electrical testing requirements specified in this Standard.

PRINCIPLES OF CONSTRUCTION OF ELECTRICAL EQUIPMENT. Accessible conductive parts of equipment operating from supply voltage must be protected from becoming live in the event of insulation failure or the bypassing of insulation during the normal use of the equipment (e.g. through the ingress of liquids or foreign objects).

This protection may be provided by either one or a combination of the following:

(a) Provision of single insulation between the accessible conductive parts and the live parts, and earthing the accessible conductive parts.

(b) Provision of double or reinforced insulation between the accessible conductive parts and the live parts.

Equipment in which some or all the accessible conductive parts require protective earthing, as described in (a), are single insulated items and are also referred to as Class I equipment. The protective earthing terminal of this equipment is marked with either of the symbols 'E' or ⏚.

Equipment in which none of the accessible conductive parts require protective earthing, due to the provision of double or reinforced insulation as described in (b), are double insulated items and are also referred to as Class II equipment. This equipment is marked with the symbol ⧈ or with the words 'DOUBLE INSULATED'.

PROTECTIVE EARTHING. The resistance to earth from protectively earthed parts in Class I equipment must be low enough to permit adequate fault current to flow to earth, thereby ensuring that the overcurrent protection device in the final subcircuit (i.e. fixed wiring) opens quickly in the event of insulation failure.

The protective earthing conductor also ensures that any leakage current from the live parts within Class I equipment flows harmlessly via a low resistance path, to earth.

Accordingly, all Class I equipment must have the integrity and resistance value of its earthing conductor checked at regular intervals during its service life, e.g. to ensure that connections have not been loosened, transposed or corroded.

INSULATION RESISTANCE. Insulation resistance testing is intended to ensure the integrity of the insulation between live mains parts and accessible conductive parts.

Accordingly, equipment must have its insulation resistance measured prior to commissioning and at regular intervals during its service life, to ensure that no degradation has occurred since manufacture, during transport, or during its service life.

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