Australian Standard™

Functional safety of electrical/electronic/programmable electronic safety-related systems

Part 6: Guidelines on the application of AS 61508.2 and AS 61508.3

Standards Australia

This Australian Standard was prepared by Committee IT-006, Information Technology for Industrial Automation and Integration. It was approved on behalf of the Council of Standards Australia on 18 April 2001 and published on 19 June 2001.

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Australian Electrical and Electronic Manufacturers Association

CSIRO Centre for Planning and Design

CSIRO Manufacturing Science and Technology

Industrial Instrument Industry Association of Australia

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PREFACE

This Standard was prepared by the Standards Australia Committee IT-006, Information Technology for Industrial Automation and Integration.

The objective of this Standard is to provide designers of safety lifecycle activities in systems comprised of electrical/electronic/programmable electronic devices with guidelines on the applications, calculations and methodologies as outlined in Part 2 and in Part 3 of this Standard.

This Standard is identical with and has been reproduced from IEC 61508-6:2000, *Functional safety of electrical/electronic/programmable elctronic safety-related systems—Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3*.

A reference to an International Standard identified in the Normative References Clause by strikethrough (~~example~~) is replaced by a reference to the Australian or Australian/New Zealand Standard(s) listed immediately thereafter and identified by shading (example). Where the struck-through referenced document and the referenced Australian or Australian/New Zealand Standard are identical, this is indicated in parenthesis after the title of the latter.

In this Standard, the following print types are used:

– requirements proper: in arial type;

– *test specifications: in italic type;*

– explanatory matter: in smaller arial type.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text ‘this standard’ should read ‘this Australian Standard’.

(c) A full point should be substituted for a comma when referring to a decimal marker.

The term ‘informative’ has been used in this Standard to define the application of the annex to which it applies. An ‘informative’ annex is only for information and guidance.

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Part 6: Guidelines on the application of AS 61508.2 and AS 61508.3

1 Scope

1.1 This part of IEC 61508 contains information and guidelines on IEC 61508-2 and IEC 61508-3.

- Annex A gives a brief overview of the requirements of IEC 61508-2 and IEC 61508-3 and sets out the functional steps in their application.
- Annex B gives an example technique for calculating the probabilities of hardware failure and should be read in conjunction with 7.4.3 and annex C of IEC 61508-2 and annex D.
- Annex C gives a worked example of calculating diagnostic coverage and should be read in conjunction with annex C of IEC 61508-2.
- Annex D gives a methodology for quantifying the effect of hardware-related common cause failures on the probability of failure.
- Annex E gives worked examples of the application of the software safety integrity tables specified in annex A of IEC 61508-3 for safety integrity levels 2 and 3.

1.2 IEC 61508-1, IEC 61508-2, IEC 61508-3 and IEC 61508-4 are basic safety publications, although this status does not apply in the context of low complexity E/E/PE safety-related systems (see 3.4.4 of IEC 61508-4). As basic safety publications, they are intended for use by technical committees in the preparation of standards in accordance with the principles contained in IEC Guide 104 and IEC/ISO Guide 51. IEC 61508 is also intended for use as a stand-alone standard.

1.3 One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its publications. In this context, the requirements, test methods or test conditions of this basic safety publication do not apply unless specifically referred to or included in the publications prepared by those technical committees.

NOTE In the USA and Canada, until the proposed process sector implementation of IEC 61508 (i.e. IEC 61511) is published as an international standard, existing national process safety standards based on IEC 61508 (i.e. ANSI/ISA S84.01-1996) can be applied to the process sector instead of IEC 61508.

1.4 Figure 1 shows the overall framework for parts 1 to 7 of this standard and indicates the role that IEC 61508-6 plays in the achievement of functional safety for E/E/PE safety-related systems.