AS 61508.0—2006

Australian Standard®

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

## Part 0: Functional safety and AS 61508



This Australian Standard® was prepared by Committee IT-006, Industrial Automation Systems and Integration. It was approved on behalf of the Council of Standards Australia on 3 November 2006.
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The following are represented on Committee IT-006:

- Association of Consulting Engineers Australia
- Australian Electrical and Electronic Manufacturers Association
- CSIRO Centre for Planning and Design
- Engineers Australia
- Institute of Chemical Engineers Australia
- Institute of Instrumentation, Control and Automation Australia
- Monash University
- Process Control Society
- RMIT University
- The University of Melbourne

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This Standard was issued in draft form for comment as DR 06486.

Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through public comment period.

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## Part 0: Functional safety and AS 61508

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# PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee IT-006, Industrial Automation Systems and Integration.

The objective of this Standard is to introduce the concept of functional safety and to give an overview of the IEC 61508 series of standards.

This Standard is identical with, and has been reproduced from IEC/TR 61508-0:2005, *Functional safety of electrical/electronic/programmable electronic safety-related systems*— Part 0: *Functional safety and IEC 61508*.

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

(a) Its number appears on the cover and title page while the international standard number appears only on the cover

(b) In the source text 'this Technical Report' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

| *Reference to International Standard* IEC | | *Australian Standard* AS | |
|---|---|---|---|
| 61508 | Functional safety of electrical/electronic/programmable electronic safety-related systems | 61508 | Functional safety of electrical/electronic/programmable electronic safety-related systems |
| 61508-1 | Part 1: General requirements | 61508.1 | Part 1: General requirements |
| 61508-2 | Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems | 61508.2 | Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems |
| 61508-3 | Part 3: Software requirements 61508-4:1998 Functional safety of electrical/electronic/programmable electronic safety-related systems | 61508.3 | Part 3: Software requirements 61508-4:1998 Functional safety of electrical/electronic/programmable electronic safety-related systems |
| 61508-4 | Part 4: Definitions and abbreviations 61508-5:1998 Functional safety of electrical/electronic/programmable electronic safety-related systems | 61508.4 | Part 4: Definitions and abbreviations 61508-5:1998 Functional safety of electrical/electronic/programmable electronic safety-related systems |
| 61508-5 | Part 5: Examples of methods for the determination of safety integrity levels | 61508.5 | Part 5: Examples of methods for the determination of safety integrity levels |
| 61508-6 | Part 6: Functional safety of electrical/electronic/programmable electronic safety-related systems— Guidelines on the application of AS 61508.2 and AS 61508.3 | 61508.6 | Part 6: Functional safety of electrical/electronic/programmable electronic safety-related systems— Guidelines on the application of AS 61508.2 and AS 61508.3 |
| 61508-7 | Part 7: Functional safety of electrical/electronic/programmable electronic safety-related systems— Overview of techniques and measures | 61508.7 | Part 7: Functional safety of electrical/electronic/programmable electronic safety-related systems— Overview of techniques and measures |

Only international references that have been adopted as Australian Standards have been listed.

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

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Annex A (informative) List of frequently asked questions from IEC “functional safety” zone .11

# INTRODUCTION

The purpose of this Technical Report is to introduce the concept of functional safety and to give an overview of the IEC 61508 series of standards.

You should read it if you are:

- wondering whether IEC 61508 applies to you,
- involved in the development of electrical, electronic or programmable electronic systems which may have safety implications, or
- drafting any other standard where functional safety is a relevant factor.

Clause 3 of this document gives an informal definition of functional safety, describes the relationship between safety functions, safety integrity and safety-related systems, gives an example of how functional safety requirements are derived, and lists some of the challenges in achieving functional safety in electrical, electronic or programmable electronic systems. Clause 4 gives details of IEC 61508, which provides an approach for achieving functional safety. The clause describes the standard's objectives, technical approach and parts framework. It explains that IEC 61508 can be applied as is to a large range of industrial applications and yet also provides a basis for many other standards.

NOTES

AUSTRALIAN STANDARD

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

## Part 0:
## Functional safety and AS 61508

### 1 Scope

This Technical Report introduces the concept of functional safety and gives an overview of the IEC 61508 series.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61508-1:1998, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 1: General requirements*

IEC 61508-2:2000, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems*

IEC 61508-3:1998, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 3: Software requirements*

IEC 61508-4:1998, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 4: Definitions and abbreviations*

IEC 61508-5:1998, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 5: Examples of methods for the determination of safety integrity levels*

IEC 61508-6:2000, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3*

IEC 61508-7:2000, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 7: Overview of techniques and measures*

IEC Guide 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC Guide 51, *Safety aspects – Guidelines for their inclusion in standards*