

AS/NZS 3931:1998
IEC 60300-3-9:1995

Australian/New Zealand Standard[®]

**Risk analysis of technological
systems—Application guide**

[IEC title: Dependability management, Part 3: Application guide,
Section 9: Risk analysis of technological systems]

AS/NZS 3931:1998

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee MB/2, Risk Management. It was approved on behalf of the Council of Standards Australia on 1 December 1997 and on behalf of the Council of Standards New Zealand on 2 March 1998. It was published on 5 April 1998.

The following interests are represented on Committee MB/2:

Australian Electrical and Electronic Manufacturers Association
Australian Nuclear Science & Technology Organization
Australian Organization for Quality
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Industrial Research, New Zealand
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Originated as AS/NZS 3931(Int):1995.
Revised and designated AS/NZS 3931:1998.

PUBLISHED JOINTLY BY:

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ISBN 0 7337 1711 X

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee MB/2, Risk Management. It is identical with, and has been reproduced from, IEC 60300-3-9:1995, *Dependability management, Part 3: Application guide, Section 9: Risk analysis of technological systems*.

The objectives of this Standard are to provide a basic model for analysis of risk; to provide guidelines for selecting and implementing risk analysis techniques, primarily for risk assessment of technological systems; and to enable quality and consistency in the planning and execution of risk analyses and in the presentation of results and conclusions.

Risk analysis is an important tool which can provide a sound basis for risk management. Users of this Standard should also be aware of AS/NZS 4360, *Risk management*, which was developed by the Joint Standards Australia/Standards New Zealand Committee OB/7, and provides a generic guide for the establishment and implementation of a risk management process which involves identification, analysis, evaluation, treatment and ongoing monitoring of risk. Risk management is an integral part of good management practice, decision, making and improvement which may be applied at all stages in the life of an activity, function, project or asset, and often involves a multi-disciplinary approach.

The decision to follow Standards policy by this adoption without amendment of the International Standard on risk analysis, IEC 60300-3-9, will assist in the development of a common methodology and understanding of the process of analysis of technological risk, thus providing a gateway across a range of countries and industries, and of applications such as design, quality and safety of technological systems. However, it introduces the following differences in terminology and application between this Standard and AS/NZS 4360 which need to be recognized and understood by users of both Standards:

- (a) *Scope and application* This Standard does not address the full process of risk management described in AS/NZS 4360, as can be understood by contrasting Figure 1 of this Standard with Figures 3.1 and 4.1 of AS/NZS 4360.
- (b) *Terminology* This Standard defines *risk* as a combination of the probability of occurrence and the consequences of a specified hazardous event, i.e. an event which can cause harm (physical injury, damage to health, property or the environment). It starts with analysis of 'what can go wrong' and focuses on technological applications.

AS/NZS 4360 recognizes that risk is inherent in all activity, and that risk management may be as much about identifying opportunities as avoiding or mitigating loss. It defines risk as 'the chance of something happening that will have an impact upon objectives, and which is measured in terms of consequences and likelihood'.

This Standard refers to FMEA as Fault Modes and Effects Analysis (e.g., in Table 1), i.e. it uses the term *fault* in preference to the more commonly accepted use of *failure*. The International Committee reasoned that risk analysis should include options such as planned maintenance and replacement of components to prevent failure, and that a failure is only a special case of a fault in the system or equipment.

Annex A.5, Preliminary Hazard Analysis (PHA), provides a description of a PHA which is consistent with international terminology, i.e. a qualitative study with a relatively low level of detail. However, in Australia and New Zealand, the term PHA is often used to describe what can be a very detailed risk assessment study, for example studies required as part of the development approval process for hazardous industries, in which case there are government guidelines which outline specific requirements. Care should be taken to ensure that the study objectives, methodology and level of detail are understood.

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.

For the purpose of this Standard, the source text should be modified by inserting the words 'this Australian/New Zealand Standard' to replace the words 'this section of IEC 300-3' wherever they appear. All IEC Standards have been renumbered as the IEC 60xxx series, therefore references in the source text should be modified by adding 60 to the number as a prefix.

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