ANSI/ASSP/ISO/IEC 31010-2019

Risk Management – Risk Assessment Techniques

AMERICAN SOCIETY OF
SAFETY PROFESSIONALS

Approved American National Standard
ANSI

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ANSI/ASSP/ISO/IEC 31010 – 2019

American National Standard

Risk Management – Risk Assessment Techniques

Secretariat

American Society of Safety Professionals
520 N. Northwest Highway
Park Ridge, Illinois 60068

Approved November 26, 2019

American National Standards Institute

American National Standard

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Foreword

(This Foreword is not a part of American National Standard ANSI/ASSP/ISO/IEC 31010 – 2019.)

This standard was developed by an American National Standards Committee (United States Technical Advisory Group to ANSI or ISO/TC262), in concert with the standards organizations and liaisons of the TC262 acting within the ISO Directives. The committee, which is national in scope, functions under the Essential Requirements Document of the American National Standards Institute with the American Society of Safety Professionals (ASSP) as Secretariat. This standard provides risk management principles and guidelines

This standard is an identical adoption of the from ISO/IEC 31010:2019, an international standard also titled “Risk Management – Risk Assessment Techniques.” This document was approved as an international standard in May 2019. This standard replaces American National Standard ANSI/ASSP Z690.3-2011.

It is intended that the procedures and performance requirements detailed herein will be adopted by every employer whose operations fall within the scope and purpose of the standard.

Neither the standards committee, nor the secretariat, feel that this standard is perfect or in its ultimate form. It is recognized that new developments are to be expected, and that revisions of the standard will be necessary as the art progresses and further experience is gained. It is felt, however, that uniform requirements are very much needed and that the standard in its present form provides for the minimum performance requirements necessary in developing and implementing risk management programs.

During August 2019 the United States TAG (Technical Advisory Group) to ANSI for risk management reached consensus that this document should be adopted as American National Standards. Due to the ongoing significant interest being focused on risk management at the international level, additional consensus was reached that there should also be a committee looking at risk management standards for the United States. Such a committee would function under accreditation of ASSP as a standards developing organization (SDO).

Public review of the document was then conducted during November 2019. There were no negative comments submitted to ASSP as the secretariat. All committee votes for adoption were positive without any submitted negative comments.

At the time this standard was approved, the Technical Advisory Group (TAG) had the following members:

Erike Young, CSP, ARM-E, Chair
Bruce Lyon, P.E., CSP, ARM, CHMM, Vice-Chair
Lauren Bauerschmidt, MS Engr, CSP, STS, Secretary
Ovidiu Munteanu, Assistant Secretary
Jennie Dalesandro, Secretary Support

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American Society of Safety Professionals	James Newberry
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Observing Organization(s)	Name of Representative(s)
ASSP Risk Assessment Institute	Kenneth Daigle
	Paul Zoubek

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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RISK MANAGEMENT – RISK ASSESSMENT TECHNIQUES

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 31010 has been prepared by IEC technical committee 56: Dependability, in co-operation with ISO technical committee 262: Risk management.

It is published as a double logo standard.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- more detail is given on the process of planning, implementing, verifying and validating the use of the techniques;
- the number and range of application of the techniques has been increased;
- the concepts covered in ISO 31000 are no longer repeated in this standard.

The text of this International Standard is based on the following documents of IEC:

FDIS	Report on voting
56/1837/FDIS	56/1845/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table. In ISO, the standard has been approved by 44 P members out of 46 having cast a vote.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This document provides guidance on the selection and application of various techniques that can be used to help improve the way uncertainty is taken into account and to help understand risk.

The techniques are used:

- where further understanding is required about what risk exists or about a particular risk;
- within a decision where a range of options each involving risk need to be compared or optimized;
- within a risk management process leading to actions to treat risk.

The techniques are used within the risk assessment steps of identifying, analysing and evaluating risk as described in ISO 31000, and more generally whenever there is a need to understand uncertainty and its effects.

The techniques described in this document can be used in a wide range of settings, however the majority originated in the technical domain. Some techniques are similar in concept but have different names and methodologies that reflect the history of their development in different sectors. Techniques have evolved over time and continue to evolve, and many can be used in a broad range of situations outside their original application. Techniques can be adapted, combined and applied in new ways or extended to satisfy current and future needs.

This document is an introduction to selected techniques and compares their possible applications, benefits and limitations. It also provides references to sources of more detailed information.

The potential audience for this document is:

- anyone involved in assessing or managing risk;
- people who are involved in developing guidance that sets out how risk is to be assessed in specific contexts;
- people who need to make decisions where there is uncertainty including:
  - those who commission or evaluate risk assessments,
  - those who need to understand the outcomes of assessments, and
  - those who have to choose assessment techniques to meet particular needs.

Organizations that are required to conduct risk assessments for compliance or conformance purposes would benefit from using appropriate formal and standardized risk assessment techniques.

RISK MANAGEMENT – RISK ASSESSMENT TECHNIQUES

1 Scope

This International Standard provides guidance on the selection and application of techniques for assessing risk in a wide range of situations. The techniques are used to assist in making decisions where there is uncertainty, to provide information about particular risks and as part of a process for managing risk. The document provides summaries of a range of techniques, with references to other documents where the techniques are described in more detail.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO Guide 73:2009, *Risk management – Vocabulary*

ISO 31000:2018, *Risk management – Guidelines*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 31000:2018, ISO Guide 73:2009 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
likelihood
chance of something happening

Note 1 to entry: In risk management terminology, the word "likelihood" is used to refer to the chance of something happening, whether defined, measured or determined objectively or subjectively, qualitatively or quantitatively, and described using general terms or mathematically (such as a probability or a frequency over a given time period).

Note 2 to entry: The English term "likelihood" does not have a direct equivalent in some languages; instead, the equivalent of the term "probability" is often used. However, in English, "probability" is often narrowly interpreted as a mathematical term. Therefore, in risk management terminology, "likelihood" is used with the intent that it should have the same broad interpretation as the term "probability" has in many languages other than English.

[SOURCE: ISO 31000:2018, 3.7]

3.2
opportunity
combination of circumstances expected to be favourable to objectives

Note 1 to entry: An opportunity is a positive situation in which gain is likely and over which one has a fair level of control.