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CSA N290.17:23

Probabilistic safety assessment for nuclear power plants

English

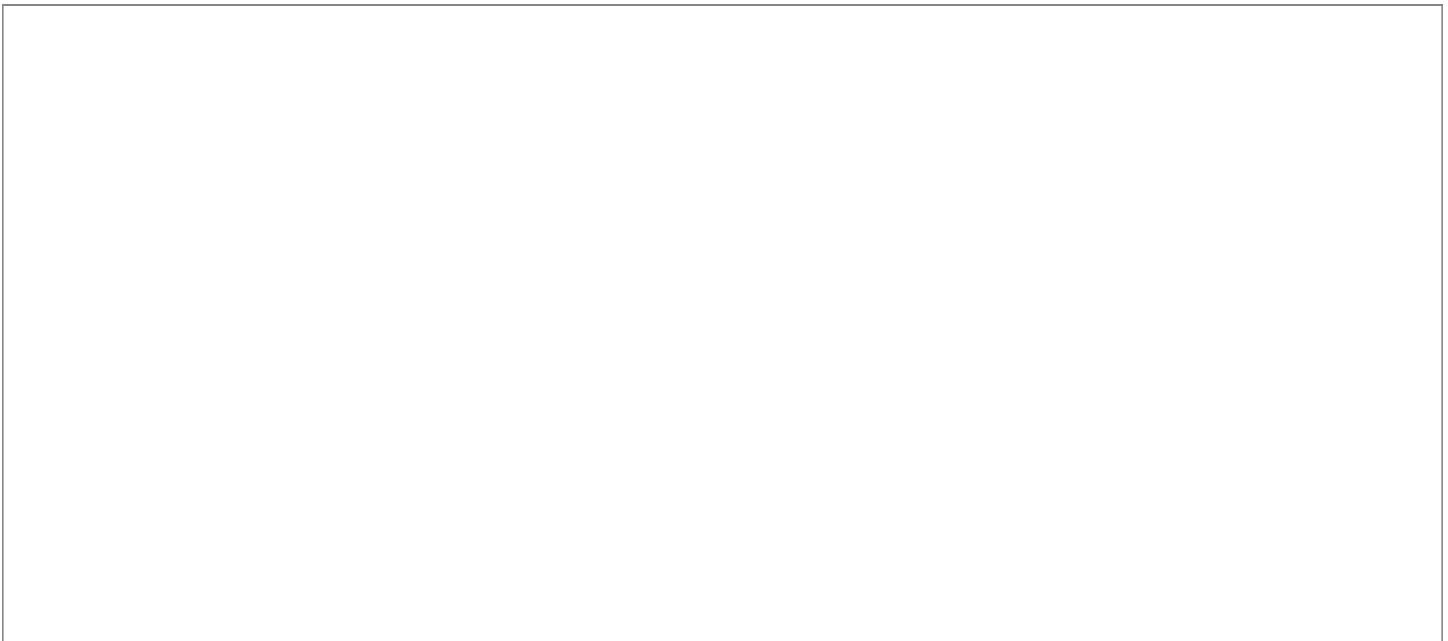
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Preface/Scope

Preface

This is the second edition of CSA N290.17, *Probabilistic safety assessment for nuclear power plants*. It supersedes the previous edition published in 2017.

This Standard provides requirements regarding preparation and maintenance of a probabilistic safety assessment at a water-cooled nuclear power plant. It reflects Canadian regulatory requirements, operating experience of the Canadian nuclear industry, and international good practices, including requirements of the International Atomic Energy Agency (IAEA), the American Society of Mechanical Engineers (ASME), and the American Nuclear Society (ANS).

Changes to this edition include

- a) the addition of OPEX on POS duration;
- b) guidance on mission time based on industry developments;

c) clarification of qualitative and quantitative screening criteria in Annex F;

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d) clarification of the meaning of clauses related to power capability for our customers. For more information about Cookies and how you can disable

e) updating the publications listed in Clause 2 with latest editions; and
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f) alignment of definitions with CSA common definitions and other CSA N290 series of Standards.

Users of this Standard are reminded that the site selection, design, manufacture, construction, installation, commissioning, operation, and decommissioning of nuclear facilities in Canada are subject to the Nuclear Safety and Control Act and its Regulations. The Canadian Nuclear Safety Commission might impose additional requirements to those specified in this Standard.

The CSA N-Series Standards provide an interlinked set of requirements for the management of nuclear facilities and activities. The CSA N286 Standard provides overall direction to management to develop and implement sound management practices and controls, while the other CSA Group nuclear Standards provide technical requirements and guidance that support the management system. This Standard works in harmony with CSA N286 and does not duplicate the generic requirements of CSA N286; however, it might provide more specific direction for those requirements.

This Standard was prepared by the Subcommittee on Probabilistic Safety Assessment for Nuclear Power Plants, under the jurisdiction of the Technical Committee on Reactor Safety and Risk Management and the Strategic Steering Committee on Nuclear Standards, and has been formally approved by the Technical Committee.

Scope

1.1 Reactors and other potential sources

This Standard provides the requirements and guidance for the preparation and maintenance of a PSA at a water-cooled NPP. The radiation sources of concern include both

- a) water-cooled power reactors; and
- b) other potential sources of radioactive releases to the environment.

Notes:

- 1) This Standard may be used to provide guidance for nuclear facilities other than NPPs or non-water-cooled reactors. Other nuclear facilities may apply to this Standard using a graded approach commensurate with risk.
- 2) Water-cooled small modular reactors (SMRs) have not been explicitly considered in the development of this Standard. However, this Standard might be generally applicable to water-cooled SMRs.
- 3) Other potential sources include, for example, wet storage bays and dry used fuel storage facilities.
- 4) Systems that only contain radiation during post-accident conditions [e.g., emergency coolant injection (ECI) recovery], are not considered in the identification of radiation sources. The source of radiation of those systems is the reactor, which is considered already as a source.

1.2 New and existing reactors

This Standard applies to both new and existing water-cooled NPPs.

Notes:

- 1) Existing NPPs refers to NPPs initially licensed before 2017.

2) New NPPs licensed after 2016.

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3) The requirements for a new NPP might be different than the requirements for an existing NPP. This Standard notes where the requirements might be different. Cookies, visit our privacy policy page. [Learn More \(https://www.csagroup.org/legal/privacy-policy/#cookies\)](https://www.csagroup.org/legal/privacy-policy/#cookies)

1.3 Single and multi-reactor facilities

This Standard applies to NPPs with one or more water-cooled power reactors.

Notes:

1) The requirements for a single-reactor NPP might be different than the requirements for a multi-reactor NPP. This Standard notes where the requirements might be different.

2) Provisions related to the risk aggregation and whole-site PSA are provided in Clause 13 and Annex I.

1.4 Level 1 PSA and Level 2 PSA

This Standard addresses both Level 1 PSA and Level 2 PSA.

1.5 Whole-site PSA

This Standard applies to both specific PSAs and whole-site PSAs.

Notes:

1) A specific PSA might assess only a single hazard for a single source at an NPP. A whole-site PSA assesses all sources and all hazards.

2) Some parts of this Standard apply only to specific PSAs. For example, Annexes C to H apply only to specific hazards for power reactors. This Standard notes where requirements apply only to specific PSAs.

1.6 Malevolent acts

This Standard does not address and does not apply to malevolent acts.

Note: In Canada, malevolent acts are addressed separately under the CNSC Nuclear Security Regulations. See SOR/2000-209.

1.7 Terminology

In this Standard, shall is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; should is used to express a recommendation or that which is advised but not required; and may is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

1.8 Additional terminology

In this Standard, shall be considered or shall consider means that the user evaluates the impact and documents any decisions.

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