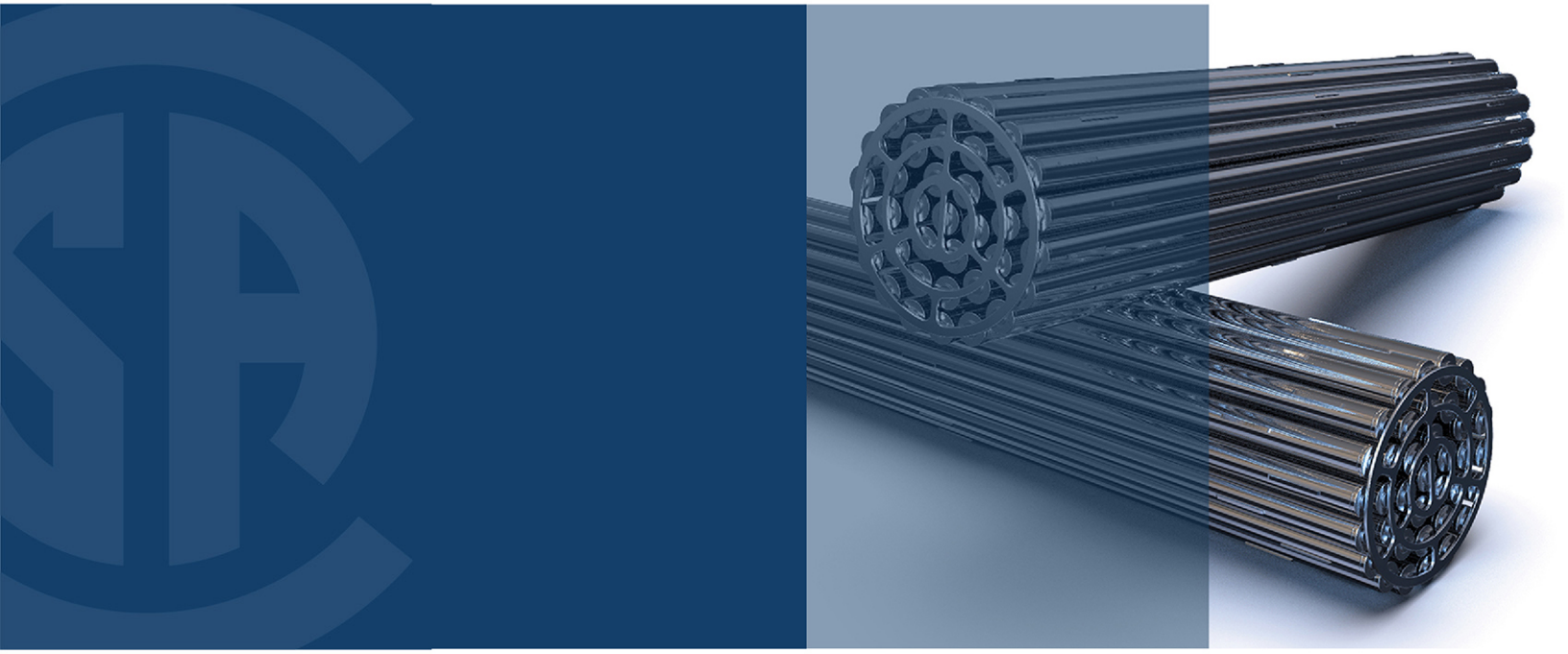
CSA N290.14:24

Qualification of digital hardware and software for use in instrumentation and control applications for nuclear power plants



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Preface

This is the third edition of CSA N290.14, *Qualification of digital hardware and software for use in instrumentation and control applications for nuclear power plants.* It supersedes the previous editions published in 2015 and 2007.

The major changes to this edition include the following:
a) clarification of the application of this Standard;
b) update of requirements to ensure alignment with other recently issued Standards and publications;
c) update of definitions for alignment with CSA common definitions;
d) addition of a simplified qualification approach for mass-produced items with embedded software; and
e) clarification of qualification concerns requirements in Annex A, including elimination of duplicate requirements covered by other standards.

This Standard has been expanded to cover a wider range of software qualification applications, and also covers hardware qualification of digital systems. This Standard establishes a qualification process for digital instrumentation and control systems and components for use in nuclear power plants and provides guidance for maintaining qualification once it has been established. This Standard addresses application-specific qualification. It outlines a set of qualification concerns and failure modes that allow candidate products to be assessed within the context of their applications. It is intended for this Standard to be used by the licensees of nuclear power plants, as well as the designers, manufacturers, and fabricators of nuclear power plant systems and components.

This Standard adopts a selection process for safety categories as provided in other national and international standards and industry guides. Further guidance on equipment qualification is provided by other CSA and IEC standards.

This Standard is one of a series of standards on reactor control systems, safety systems, and instrumentation for nuclear power plants.

The CSA N-Series Standards provide an interlinked set of requirements for the management of nuclear facilities and activities. CSA N286 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.

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.

This Standard was prepared by the Subcommittee on Qualification of Digital Hardware and Software for Use in Instrumentation and Control Applications for Nuclear Power Plants under the jurisdiction of the Technical Committee on Reactor Control Systems, Safety Systems, and Instrumentation for Nuclear Power Plants and the Strategic Steering Committee on Nuclear Standards and has been formally approved by the Technical Committee.

Notes:
1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*