



CSA Group Input to Canada's Radioactive Waste Policy Review

Overview of CSA Group

Canadian Standards Association, operating as CSA Group (CSA), is a not-for-profit, membership-based organization serving business, industry, government, and consumers in Canada and around the world. Since 1919, CSA has grown to become one of the largest Standards Development Organizations (SDOs) in Canada. CSA is accredited by Standards Council of Canada (SCC) and American National Standards Institute (ANSI), allowing CSA to develop accredited national standards for Canada and the United States, as well as binational standards. CSA also participates in international standards development through ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission).

CSA has over 10,000 expert volunteer members representing industry, regulators, government, academia and consumers. Our members develop and maintain over 3,000 standards, codes and related products in over 50 technology areas. CSA standards and codes help to improve safety, health, the environment, and economic efficiency in Canada and beyond, and are widely referenced in regulations to support public policy initiatives. To keep pace with changing technology and systems, we rely on our extensive research program that provides valuable information and insights on new and emerging areas that have the potential to impact safety, health, the environment, and the economy, and that supports the development of future standards.

CSA Nuclear Program

The CSA Nuclear program was established over 45 years ago in response to the needs of the Canadian nuclear sector to develop standards and support the safe and reliable operation of the industry. Today, over 600 volunteer expert members serve on over 65 committees that develop requirements and guidance on various subject areas addressing the life cycle of nuclear facilities, including design, construction, operations and maintenance, and decommissioning. With over 60 standards published to date and more in development, the nuclear portfolio represents a pool of knowledge and expertise for the nuclear industry, offering not only robust technical standards, but also best practice guidelines.

Standards developed within the CSA Nuclear Program represent the technical requirements for compliance with Canadian regulations when they are referenced by the Canadian Nuclear Safety Commission (CNSC) to regulate operating plants and facilities across Canada. Currently over 95% of CSA nuclear standards are referenced in the CNSC licence, licence conditions handbooks (LCH), or regulatory documents. CSA nuclear standards form an important part of the CNSC regulatory framework, a clear testament to the strength of the CSA standards development process.

CSA's accredited, consensus-based, transparent process enhances public input and acceptability, while our position as a neutral third party brings stakeholders together in a collaborative and consensus-building process – in a way that is balanced, open, and subject to public review.

CSA's process leverages in-kind contributions of key stakeholders, reducing duplication of effort, and providing a practical alternative from, or supplement to, regulation. Standards act as a vital bridge between regulation and implementation. They promote efficiency in practice by working across federal, provincial, and municipal jurisdictions.



The CSA standards development process involves benchmarking and harmonization with internationally accepted requirements and practices. Many of our standards are derived from international standards and customized for the unique needs of Canada.

Finally, CSA standards are living documents, updated and revised based on periodic review. Standards are maintained and updated based on experience gained during their application, in consideration of user feedback, to reflect technological advances, and to address the evolving needs of the sector. Of note, the CSA Nuclear Program is proactively engaging with small modular reactor (SMR) stakeholders to identify, prioritize, and address standards-based needs for new or revised requirements and guidance for SMRs, which could include topics related to radioactive waste management.

CSA Standards for Radioactive Waste Management and Decommissioning

Specific to the topics of Canada's Radioactive Waste Policy Review, nine (9) CSA nuclear standards that are pertinent, that are either published or in development, are described below.

Radioactive Waste Management

CSA N292.0:19, *General principles for the management of radioactive waste and irradiated fuel*

This standard specifies common requirements for the management of radioactive waste and irradiated fuel from generation to storage or disposal. Management activities include, but are not limited to, handling, packaging, transportation, processing and storage, care-taking/monitoring, and long-term management of radioactive waste. Management requirements addressed in CSA N292.0 include minimizing the generation of radioactive waste, as well as the characterization, segregation, and classification of radioactive waste. This standard requires the implementation of a waste management program that address all waste streams associated with or potentially contaminated by nuclear substances, and considers the waste hierarchy. This standard also addresses the safety assessment and additional requirements for waste management facilities.

This standard is used in concert with all CSA standards that apply to the management of radioactive waste and irradiated fuel, including those described here.

CSA N292.1-16, *Wet storage of irradiated fuel and other radioactive materials*

This standard specifies requirements for the wet storage of irradiated fuel and other radioactive materials requiring shielding or decay heat dissipation. The standard also addresses the design, construction and commissioning, operation, and management of the wet storage system.

CSA N292.2-13, *Interim dry storage of irradiated fuel*

This standard specifies requirements specific to interim dry storage systems for irradiated fuel, including damaged or defective fuel. It also specifies requirements for the site selection, design, construction, commissioning, operation, and planning for decommissioning of dry storage systems.

CSA N292.3-14, *Management of low- and intermediate-level radioactive waste*

This standard specifies requirements specific to the management of low- and intermediate-level radioactive waste. Management activities include, but are not limited to, handling, packaging, transportation, processing and storage, monitoring, and long-term management of radioactive waste. The standard also includes considerations for waste minimization.

CSA N292.5-11, *Guideline for the exemption or clearance from regulatory control of materials that contain, or potentially contain, nuclear substances*

This guideline provides direction for the application of exemption quantity and clearance level criteria for the release of materials containing, or potentially containing, radioactive nuclear substances, and the activities necessary to demonstrate compliance with these criteria.

CSA N292.6-18, *Long-term management of radioactive waste and irradiated fuel*

This standard addresses the management of radioactive waste and irradiated fuel associated with long-term storage and transitions. Long-term storage is defined as storage beyond 50 years, but generally not exceeding 100 years. (These timeframes are consistent with the use of the term “long-term storage” by the International Atomic Energy Agency (IAEA)). Management activities include, but are not limited to, handling, packaging, transportation, processing and storage/emplacement, and monitoring. Consistent with the waste hierarchy, the standard includes requirements intended to ensure that the amount of waste that will require disposal is minimized.

[In development] CSA N292.7, *Deep geological disposal of radioactive waste and irradiated fuel*

This draft standard will specify requirements for the lifecycle of a deep geological disposal facility, and will address activities including site evaluation, design, monitoring and surveillance, safety assessment, site preparation, construction, commissioning, operation, closure, and institutional controls.

[In development] CSA N292.8, *Characterization of radioactive waste and irradiated fuel*

This draft standard will pertain to the characterization of radioactive waste and irradiated fuel. This Standard will specify the overall requirements for establishing and implementing a waste characterization strategy, program, and plan, as well as methodologies for the sampling and characterization of radioactive waste and irradiated fuel. The standard will also provide guidance for the timing of waste characterization planning and execution, waste characterization during nuclear decommissioning and site remediation, and reporting of waste characterization results. This standard will apply to waste characterization during all steps in the management of radioactive waste and irradiated fuel, including generation, handling, processing, transport, storage, and disposal.

Decommissioning of Nuclear Facilities

CSA N294:19, *Decommissioning of facilities containing nuclear substances*

This standard applies to the decommissioning of nuclear facilities and other locations where nuclear substances are managed, possessed, or stored. The standard includes requirements regarding responsibilities for decommissioning, general requirements regarding decommissioning, as well as requirements specific to the four phases of decommissioning (planning, preparation, execution, and completion of decommissioning), and requirements specific to institutional controls following decommissioning. This standard also provides requirements specific to end-state verification, with an informative Annex addressing defining end-state objectives for decommissioning.

Summary

As a leader in standards development for over 100 years, CSA has the experience to provide comprehensive standards solutions to unique challenges for Canada. As Canada’s Radioactive Waste Policy Review progresses, CSA is well positioned to proactively and continuously engage with diverse stakeholders to address standards-related needs. This includes a broad network of experts that can be leveraged to provide technical expertise, liaise with international practices, and develop and maintain standards to support the safety and reliability of nuclear facilities throughout their lifecycles and the management of radioactive waste. We hope that as decisions on Canada’s Radioactive Waste Policy are made, standards will be recognized as key supporting elements for Canada’s policy and regulatory framework. We would be pleased to provide further details and answer any questions regarding the CSA Nuclear Program and standards.