Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

REGULATING NUCLEAR POWER PLANTS

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Canada

Regulating Nuclear Power Plants

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REGULATING NUCLEAR POWER PLANTS

Nuclear power plants have been operating in Canada since the early 1970s. With regulation by the Canadian Nuclear Safety Commission (CNSC) and its predecessor, the Atomic Energy Control Board, there has never been a significant accident resulting from the operations of any of Canada's nuclear power plants.

Currently, Canada has seven nuclear power plants in different states of operation: Bruce Power Inc. operates Bruce-A and Bruce-B, Ontario Power Generation operates the Pickering-A, Pickering-B, and Darlington power plants, Hydro-Québec operates Gentilly-2 and New Brunswick Power operates the Point Lepreau facility.

Some of these nuclear power plants contain several nuclear reactors and each can produce different amounts of electricity. For example, Pickering-B has four separate reactors within the nuclear power plant. In all, there are 22 nuclear power reactors among the seven nuclear power plants in Canada.

Canadian Nuclear Power Plants

Facility	Licensee	Number of Reactors	Start-up
Bruce-A	Bruce Power Incorporated	4	1976
Bruce-B	Bruce Power Incorporated	4	1984
Darlington	Ontario Power Generation	4	1989
Gentilly-2	Hydro-Québec	1	1982
Pickering-A	Ontario Power Generation	4	1971
Pickering-B	Ontario Power Generation	4	1982
Point Lepreau	New Brunswick Power	1	1982

REGULATION AND LICENSING: SAFETY IS JOB #1

While safety is primarily the responsibility of the licensee, the *Nuclear Safety and Control Act*, its associated regulations, and the CNSC licensing process govern the entire life cycle of nuclear power plants and every aspect of their operation.

The regulatory process begins even before a nuclear power plant is constructed and continues long after a facility ceases power generation. Separate licences are required by the operator for site preparation, construction, operation and decommissioning of nuclear power plants. Before any licence is approved, the operator must appear before and satisfy the CNSC that adequate provisions are in place to achieve safety and security objectives for the duration of the proposed licence period. The CNSC considers the merits of each licence application separately and the Commission rules on each of them individually.

Licences and regulations detail very specific conditions that licensees must meet. The CNSC has full-time staff posted at each of Canada's nuclear power plants to monitor the operation of the facilities and evaluate whether licensees are fulfilling the conditions of their licences and the laws and regulations which govern them. Requirements and conditions include:

Radiation and Environmental Protection: Licensees must control, monitor and record radioactive emissions from nuclear power plants. The CNSC sets legal limits for emissions from facilities. The licensee must be able to account for any radiation which is released.

Security: The CNSC specifies security requirements for nuclear power plants including, but not limited to, the maintenance of armed response security staff, rules for the construction and use of security perimeters, barriers and security systems, and guidelines for the movement and transport of radioactive materials. These regulations and guidelines have been developed while observing international security standards for nuclear facilities.

Emergency Preparedness: Licensees must have CNSC-approved emergency preparedness plans in place, and must have the resources to practice and carry out these plans.

Maintenance: Licences list the maintenance requirements for nuclear power plants. These requirements include specifications such as frequency of maintenance, scheduled preventative maintenance and testing. Maintenance may include the upkeep, repair, replacement and testing of different elements of a power plant.

Staffing and Training: Licences detail the qualifications employees must have, such as training and work experience, for certain positions within nuclear power plants so that qualified staff are always present in key positions at the facility.

Licensees must report any incidents, such as equipment failures and potential exposures. Also, any engineering or plant design changes which may impact the safe operation of the plant must be reported to and approved by the CNSC.

The CNSC takes immediate remedial action against a licensee if licence conditions are not met or if regulations are contravened. Remedial actions can include a review of the licence or revocation of the licence.

RADIATION AND ENVIRONMENTAL MONITORING

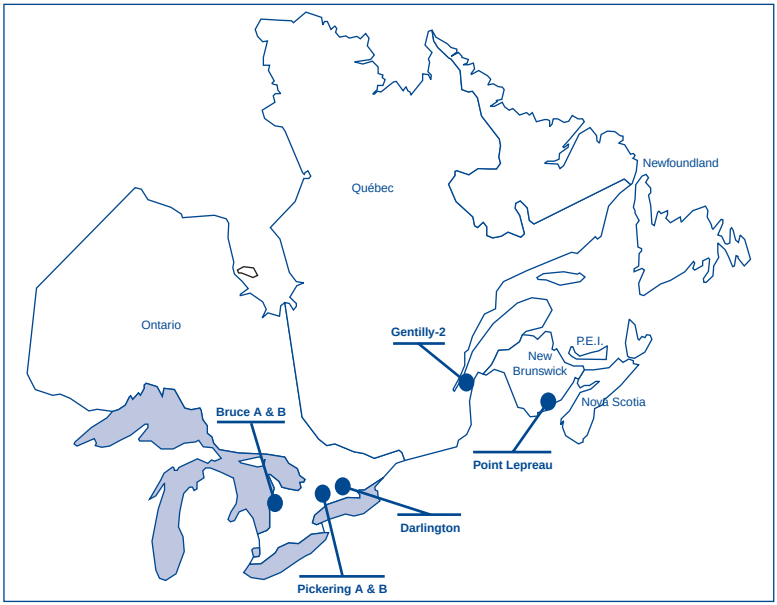
The radioactive emissions from nuclear power plants in Canada remain far below the limits allowed by law. On average, people living in the vicinity of nuclear power plants in Canada receive approximately 1 per cent of the legally allowable radiation dose per year. All releases are monitored and, should a problem arise, action would be taken to reduce releases to within legal limits.

The CNSC requires Canada's nuclear industries to employ the "ALARA" principle for limiting releases of radiation. ALARA means "As Low As Reasonably Achievable." With this principle guiding their operations, nuclear power plant operators make all reasonable efforts to reduce radiation releases to as low an amount as possible - well below regulatory limits.

The CNSC carries out reviews of licensees' environmental performance and compliance with environmental regulations. CNSC staff also assesses licensees' monitoring activities using data on emissions from the nuclear power plants and by inspecting environmental radiation protection programs.

Environmental radiation monitoring programs are carried out in the vicinity of nuclear power plants and at other locations across Canada to protect people and the environment from the potential effects of radiation. There are a number of government and industry programs in place to observe and record the levels of radiation in the environment, either from naturally occurring radioisotopes, or as a result of emissions from different nuclear facilities.

These programs measure levels of radioactivity in the air, in drinking water, in surface water, in the soil, and in food. Data is routinely gathered for a wide variety of uses. With this data, the CNSC can verify that standards are being met, evaluate the effectiveness of controls and determine environmental trends.



Locations of Canadian Nuclear Power Plants

SAFETY AND SECURITY

Canadian nuclear power plants have numerous safety and security features to protect the health and safety of the public.

Nuclear power plants have redundant safety systems, such as separate cooling systems, to provide continuous cooling of the reactor in the event of an incident. Separate reactor shutdown systems are also in place, designed to respond quickly to a wide range of incidents. The containment buildings are extremely resistant structures, designed to withstand events such as earthquakes and tornadoes.

The CNSC requires licensees to demonstrate that they are capable of preventing unauthorized access to their sites. All operators of Canadian nuclear power plants are required to have security measures in place to protect the security of the plant from all reasonable threats and to prevent the theft of nuclear materials and information.

Security plans and measures are reviewed by CNSC staff and must be approved by the CNSC before an operating licence is granted or renewed. CNSC staff monitors the status of security plans and regularly reviews the adequacy of the security measures in consultation with Canadian security agencies.

EXCEEDING THE STANDARDS

While the *Nuclear Safety and Control Act* and its associated regulations define safety standards and radiation limits, the CNSC expects licensees to not only meet these standards, but to exceed them. This principle of exceeding regulatory standards is applied in all aspects of nuclear power plant operations to make them as safe as possible for Canadians.

OUR COMMITMENT TO CANADIANS

At the Canadian Nuclear Safety Commission, our business is regulation and our job is safety. The CNSC regulates the use of nuclear energy and materials to protect health, safety, security, and the environment and to respect Canada's international commitments on the peaceful use of nuclear energy.

For more information, contact us:

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