

Chapter 27

**Canadian Nuclear Safety
Commission**

Power Reactor Regulation

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Canadian Nuclear Safety Commission

Power Reactor Regulation

Main Points

27.1 The Canadian Nuclear Safety Commission (CNSC) needs to improve its regulatory regime for power reactors to ensure that it continues to protect the health and safety of Canadians.

27.2 While the CNSC continuously monitors the compliance of power reactor licensees with regulatory requirements, its regulatory activities are not based on a rigorous, well-documented system of risk analysis and the ratings it assigns for regulatory performance (acceptable, conditionally acceptable or unacceptable) are not clear. In addition, CNSC's compliance and enforcement system is not yet complete. As a result, it cannot adequately demonstrate that it is achieving its safety objectives for the regulation of power reactors.

27.3 Like other nuclear regulators, CNSC faces significant difficulties in recruiting and retaining qualified staff. Combined with its current regulatory regime, which relies heavily on the expertise and judgment of staff, the lack of human resource capacity could impact its ability to function adequately in the future.

Background and other observations

27.4 The *Nuclear Safety and Control Act* came into force on 31 May 2000. It created the Canadian Nuclear Safety Commission to replace the Atomic Energy Control Board. CNSC is responsible for regulating the use of nuclear energy in Canada to protect health, safety, security and the environment. Our audit focussed on the regulatory activities related to power reactor licensing and regulation.

27.5 The CNSC has 440 staff. Its headquarters are in Ottawa. It maintains a site project office at each of the power reactor stations, where its staff monitor licensee compliance with regulations and the licence conditions. In fiscal year 2000, CNSC had total costs of \$59 million.

27.6 In July 1999, of some 440 power reactors in the world, 22 were in Canada — 20 in Ontario, one in Quebec and one in New Brunswick. There were 104 power reactors in the United States.

The Canadian Nuclear Safety Commission agrees with our recommendations and is taking action to address them.

Introduction

27.7 The *Nuclear Safety and Control Act* was passed in 1997 and came into force on 31 May 2000. It created the Canadian Nuclear Safety Commission (CNSC) to replace the Atomic Energy Control Board (AECB). For ease of reference, we use only CNSC throughout the chapter, but any such reference in connection with events prior to 31 May 2000 implies the former AECB. Under the Act, the CNSC, like its predecessor, regulates the use of nuclear energy in Canada to protect health, safety, security and the environment. Its regulatory regime includes setting requirements for licensees to follow, assessing and evaluating licence applications, seeking compliance with its requirements, and taking enforcement action when necessary. The balance of emphasis among these activities and on the use of regulations, licences, or policies and standards to capture requirements varies with the risks involved, the nature of the business regulated, the CNSC's experience with its licensees, and international experience. This chapter discusses its licensing and regulation of power reactors. Exhibit 27.1 lists the nuclear power stations regulated by the Canadian Nuclear Safety Commission. In July 1999, of some 440 power reactors in the world, 22 were licensees of the CNSC — 20 in Ontario, one in Quebec and one in New Brunswick. There were 104 power reactors in the United States.

27.8 CNSC's regulatory program is based on the licence holder's having prime responsibility for the safety of the nuclear power station. The licensee must demonstrate to the CNSC that the nuclear power station can and will be operated safely throughout the licensing period. Consistent with this principle, the CNSC has produced general performance standards for nuclear power stations, in addition to the specific standards codified in the regulations and referenced in the

licence. The licensee is responsible for translating the general standards into a detailed proposal that, once accepted by the CNSC, forms part of the licensing basis for the station. It also serves as the basis for future regulatory activities, such as approving changes and conducting audits and inspections of the nuclear facilities. This approach is consistent with international practice for nuclear safety.

27.9 The CNSC's position is that it will be prescriptive only when necessary; however, it has prepared detailed standards in some areas. For example, it has worked with the Canadian Standards Association to produce detailed standards of quality assurance and structural integrity for Canadian power reactors. It also participates in developing internationally accepted standards that are incorporated in regulations. These include standards for radiation protection and environmental protection.

27.10 A key element of the Canadian nuclear reactor safety philosophy is the concept of "defence-in-depth". This refers to the use of multiple barriers to reduce the risk of accidental release of radioactive material. Keeping the probability low that a system or component in the plant will fail during operation considerably reduces cumulative risk. The defence-in-depth principle also requires that procedures be in place to mitigate the consequences of accidents — for example, special safety systems incorporated in the plant design, and built-in redundancy for multiple ways of achieving the safety objective. Exhibit 27.2 demonstrates how a Canadian power reactor works.

27.11 Another internationally accepted safety principle that is fundamental to the regulation of Canada's nuclear power stations is to keep the associated risks to workers, the public, and the environment as low as reasonably achievable (ALARA), taking into account socio-economic factors. The intent is to ensure that the level of risk associated

The Canadian Nuclear Safety Commission (CNSC) replaced the Atomic Energy Control Board in May 2000.

CNSC's regulatory program is based on the licence holder's having prime responsibility for safety.

We focussed on the regulatory activities related to power reactors.

with Canada’s older power reactors, built mostly in the 1970s and 1980s, is comparable with that of modern reactors.

Focus of the audit

27.12 Our audit focussed on the regulatory activities related to the licensing and regulation of power reactors. This area of the nuclear industry is the most complex to license and regulate and the one undergoing the greatest change. In

Ontario, major changes are expected from deregulation, the introduction of competition in 2000, and private investment. The CNSC’s responsibilities related to power reactor licensees account for approximately half of its costs. In fiscal year 2000, CNSC had 440 staff and its total costs were \$59 million. Power reactors represent the CNSC’s most significant responsibility, given the risks to public health and safety in the event of a major accident. In addition, certain

Exhibit 27.1

Nuclear Power Stations Regulated by the Canadian Nuclear Safety Commission

**❶ Pickering Nuclear Generating Stations (NGS) A and B
Ontario Power Generation Inc.
Pickering, Ontario**
Pickering hosts two nuclear generating stations, Pickering NGS–A and –B. Both stations consist of four CANDU Pressurized Heavy Water reactors, each with a capacity to produce 500 megawatts of electricity. Pickering NGS–A commenced operation in 1971 and is currently in an approved shutdown state. Pickering NGS–B commenced operation in 1982.



**❷ Bruce Nuclear Generating Stations A and B
Ontario Power Generation Inc.
Tiverton, Ontario**
Tiverton hosts two nuclear generating stations, Bruce NGS–A and –B. Bruce NGS–A consists of four CANDU Pressurized Heavy Water reactors, each with a capacity to produce 750 megawatts of electricity. The station commenced operation in 1976 and is currently in an approved shutdown state. Bruce NGS–B consists of four CANDU Pressurized Heavy Water reactors, each with a licensed capacity to produce 840 megawatts of electricity. This station commenced operation in 1984.

**❸ Darlington Nuclear Generating Station
Ontario Power Generation Inc.
Bowmanville, Ontario**
Darlington NGS consists of four CANDU Pressurized Heavy Water reactors, each with a licensed capacity to produce 850 megawatts of electricity. The station commenced operation in 1989.

**❹ Gentlylly–2 Nuclear Generating Station
Hydro–Québec
Gentlylly, Quebec**
Gentlylly–2 NGS consists of one CANDU Pressurized Heavy Water reactor that has a licensed capacity to produce 600 megawatts of electricity. The station commenced operation in 1982.

**❺ Point Lepreau Nuclear Generating Station
New Brunswick Power Corporation
Point Lepreau, New Brunswick**
Point Lepreau NGS consists of one CANDU Pressurized Heavy Water reactor that has a licensed capacity to produce 600 megawatts of electricity. The station commenced operation in 1982.

Source: Canadian Nuclear Safety Commission, 2000



Pickering Nuclear Generating Station (see paragraph 27.12).

power reactor operators acknowledged in the mid-1990s certain difficulties with the management of their stations and operating units.

27.13 Our objectives in this audit were to examine whether the regulatory regime for power reactors was satisfactory to achieve its safety objectives and others. We also sought to identify factors or constraints that affect the development or implementation of regulatory regimes.

27.14 Further details on our audit objectives, scope and criteria are

presented at the end of the chapter, in **About the Audit**.

Observations and Recommendations

Risk Analysis and Performance Assessment

A need to improve risk analysis and assessment of licensee performance

27.15 After issuing a licence, the CNSC reviews the safety of operating nuclear power plants on a continuous basis for

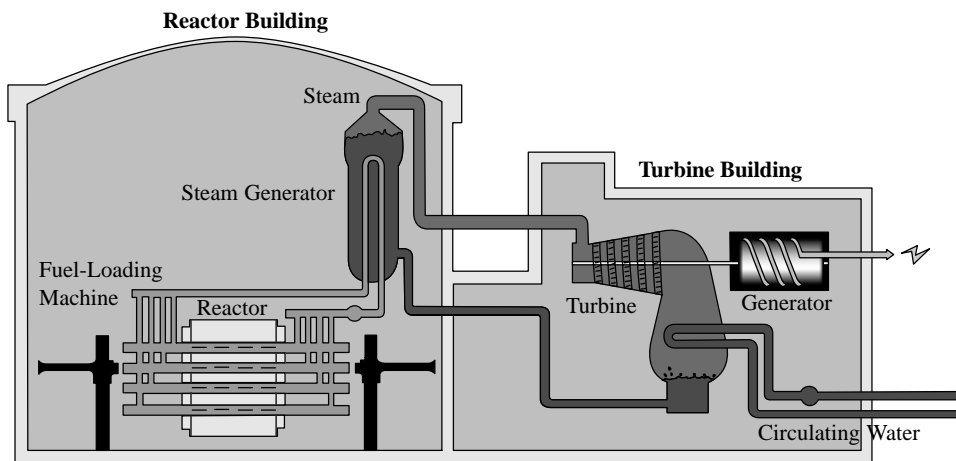


Exhibit 27.2

How a Canadian Power Reactor Works

Source: Canadian Nuclear Association

After issuing a licence, CNSC reviews the safety of nuclear power plants on a continuous basis.

compliance with regulations, relevant regulatory documents, industry codes and standards, the terms of the licence, and station policies and procedures. The review process consists of a broad range of activities, including:

- annual reviews of station safety performance;
- compliance inspections;
- review of significant events reported by the licensee;
- approval of proposed plant changes, both temporary and permanent;
- safety analyses;
- review of quality assurance;
- review of radiation protection programs and environmental impacts; and
- certification of operators and assessment of training programs.

27.16 The CNSC maintains staff at site project offices at each of the power reactor stations to monitor the licensee's compliance with regulations and the licence conditions. The CNSC's safety review process focusses on obtaining assurance that the risk to the health and safety of the public and employees and the risk to the environment remain within the bounds of the licensing basis for the facility. In addition, specialists at CNSC headquarters in Ottawa review and verify, in co-operation with the CNSC's site staff, the quality and reliability of key reactor components and provisions such as safety analyses, radiation protection, operating performance, safety procedures, and management of the facilities. The review process is linked to a two-year licence renewal cycle and covers all areas of CNSC's regulatory requirements.

27.17 We expected that the CNSC would base its regulatory activities on an analysis of relevant risks, the results of previous regulatory activities, and a rigorous, well-documented process linking

activities to required results. We expected that it would report its assessments of regulatory performance in a way that was clear and understandable to all stakeholders. We observed significant improvement since our last audit in 1994, as a result of recent changes in the CNSC's organization, including the creation of the power reactor evaluation division (PRED) responsible for managing the overall review of nuclear power facilities' safety performance. However, there are still areas that require improvement.

27.18 The CNSC does not use quantitative measures to rate nuclear power facilities. It is aware that the industry is making extensive use of nuclear power plant performance measures, including safety-related indicators, and it is testing and refining its own recently developed set of safety performance indicators. While a few other CNSC divisions have developed formal approaches to risk analysis as a basis for proposed regulatory activity, divisions involved in power reactor regulatory work have used an intuitive approach, relying on the judgment and expertise of staff. However, safety performance indicators along with that judgment and expertise are not yet applied in any systematic, integrated way to determine the nature or level of work to be performed. Without this type of analysis, CNSC cannot demonstrate whether it is doing enough work in any area or too much, and whether it is overstaffed or understaffed.

27.19 In its licensing reports, the CNSC assesses and categorizes various aspects of performance as "acceptable", "conditionally acceptable", or "unacceptable". In addition, it provides an overall qualitative assessment of the licensee's performance along with a recommendation on whether the licence should be renewed.

27.20 The CNSC's approach to reporting on licensee performance is a significant improvement over the past

practice of reporting only exceptions. It now features a standardized reporting framework, more balanced reporting, evidence to support the assessment, and an evaluation of performance that includes the views of all of the divisions involved in power reactor regulation. However, the criteria for what is acceptable or unacceptable are subjective, which can lead to lack of understanding and agreement, both within CNSC and between CNSC and licensees, on the adequacy of safety performance.

27.21 The rating “conditionally acceptable” does not clarify whether and to what degree safety is being managed properly and the licensee’s action plans and progress are satisfactory. In addition, when, for example, there are 30 issues that are rated “conditionally acceptable”, there is no mechanism for ranking them according to risk or integrating them to provide an overall perspective on the safety performance of a plant.

27.22 Any system of assessing licensee performance will always require the use of judgment, whether the system is qualitative, involves quantitative measurement, or combines both. Further clarification and possible expansion of the three performance ratings would improve the consistency of interpretation. In addition, clearly defined ratings would lead to more efficient communication among licensees, the CNSC, the public, and other stakeholders.

27.23 The Canadian Nuclear Safety Commission (CNSC) should implement a quantifiable rating of safety performance, taking into account the safety-related portion of other systems used in the industry, and should use this rating, along with a more rigorous and integrated risk assessment and other qualitative information, to systematically determine the level and type of regulatory effort required. CNSC should also clarify the meaning of its performance ratings

(“acceptable”, “conditionally acceptable” and “unacceptable”) and better integrate its findings to ensure that a licensee’s overall performance is clearly understood and communicated.

CNSC’s response: The CNSC undertakes the regulation of safety performance by committing to a comprehensive program of regulatory oversight activities. The CNSC agrees that quantifiable ratings of licensee performance could, as part of an integrated risk assessment process, support the determination of priorities, and the level and type of regulatory effort that is deployed for different regulatory activities. The CNSC will evaluate options for such approaches.

The CNSC agrees that rankings of “acceptable”, “conditionally acceptable”, and “unacceptable” need to be clarified to enable consistent application and effective communication of licensees’ overall safety performance. A review of the use of these rankings has already been initiated with a target for completion by fall 2000.

Compliance and Enforcement Framework

Development of the compliance and enforcement framework has not been completed

27.24 After Parliament passed the *Nuclear Safety and Control Act* in 1997, the CNSC made considerable progress in revising some regulatory documents and developing new regulations that would be needed when the Act came into force. However, management acknowledged that uncertainty as to when this would happen contributed to delays in completing other regulatory documents. As well, a requirement for extensive consultation with the nuclear industry, changes in responsibilities affecting some federal and provincial bodies, and a difficult clearance process all added to the delay. Now that the *Act* is in effect, regulatory documents such as standards, policies and guides are

Criteria for what is acceptable or unacceptable are subjective and can lead to a lack of understanding.

About 50 more guidance documents are required for power reactor regulation.

needed to clearly explain the CNSC's regulatory requirements to staff, licensees and the public. Eight major regulatory documents that set out regulatory expectations for nuclear power plants have been carried over from the old regime, but the CNSC has determined that it needs about 50 more documents for licensees as well as important additional guidance for staff. These documents are at various stages of development.

A 1998 internal audit found that compliance inspections, enforcement and follow-up activities adhere to established practices.

27.25 Both managers at the licensed nuclear facilities and staff of the CNSC, particularly those at site project offices, have asked that the CNSC give high priority to completing regulatory documents and communicate the new expectations clearly, particularly for the compliance program. To make the regulatory system transparent and effective, licensees need a clear understanding of the regulatory requirements, the processes for monitoring compliance, and the rules of enforcement.

Compliance and enforcement policy and programs to ensure consistency have not yet been implemented.

27.26 A 1998 internal audit of compliance inspection, enforcement and follow-up activities found that they generally adhere to established practices and procedure. CNSC staff have identified instances of non-compliance with licensing conditions and followed up on them. However, the audit also found inconsistencies within and among divisions. New project officers or inspectors sometimes use standards different from those used by previous staff (either higher or lower), or different methods of obtaining assurance that licence conditions are met. Typically, the differences in obtaining assurance are a matter of whether or not an inspector relies on licensee systems and procedures.

27.27 The internal audit recommended that CNSC's Executive Committee develop and approve a compliance program policy that would be implemented consistently across the organization. Such a policy was approved in early 2000 and a plan developed to

implement it. In the first of four phases, a training workshop on the development of compliance programs was held in May 2000. The compliance and enforcement policy and programs are designed to identify regulatory requirements and communicate them to licensees, and also to ensure that compliance and enforcement are applied consistently and effectively across the CNSC. According to CNSC, this should lead to a more results-based and systematic approach, taking into account a licensee's past compliance history when deciding whether to increase or decrease the level of scrutiny.

27.28 To ensure that its regulations are transparent and predictable to staff, licensees and the public, the CNSC should, with all due haste, finish developing the regulatory documents that set out the requirements by which licensees will be assessed. It should also implement its compliance and enforcement policy.

CNSC's response: The CNSC agrees that there is a need to accelerate the development of a number of regulatory policies, standards and guides. Specific objectives for this work are set out in the CNSC's Strategic Plan 2000. To achieve ordered progress in this area, senior staff members have been taken off-line and assigned full time to the development of the regulatory framework, and a committee has been set up to establish the priorities for work on regulatory documents. Among the activities that are already in progress is a comprehensive program that is dedicated to the implementation of the compliance and enforcement policy.

Human Resource Management

Human resource capacity is critical to success

27.29 From the early years of the CNSC, the combination of its small size and its growing technological complexity

fostered the evolution of an informal organizational structure and related regulatory processes. The CNSC adopted a non-prescriptive approach to regulation, relying on the competence and professional judgment of its growing complement of knowledgeable staff.

27.30 As its staff increased from 50 in the early 1970s to about 440 today, the CNSC was successful in attracting suitably qualified scientists and engineers from industry to its expanding organization. However, its approach to regulation continued to be non-prescriptive and relied heavily on the knowledge and competence that its staff had gained earlier in their careers. In the 1990s, it became clear that this pool of expertise would begin to disappear as experienced staff moved closer to retirement eligibility. Given the shrinking pool of external expertise and an increasingly competitive market for talent, it was obvious that the CNSC would need to make major adjustments to the management environment.

27.31 Beginning in 1995, several project teams were formed to identify areas for management improvement. This initiative later became known as Project '96 and resulted in about 400 recommendations, which included 110 recommendations for improving human resource management, including training. Since 1997, the Human Resources Management Division has set a number of priorities for development or revision of human resource policies and practices in the CNSC as well as their formal documentation. The most important included a new classification standard and related salary structure; competency profiles and statements of roles and responsibilities for all levels of management; and approval of an annual training strategy. While this represents a significant step forward, there are still significant issues that need to be addressed.

27.32 CNSC is exempt from the *Public Service Employment Act* and can therefore develop and apply its own recruitment policies and practices. Similarly, it has authority to design and implement job classification and compensation programs distinct from those of the public service.

Recruitment and staffing strategies needed

27.33 Like other federal regulatory organizations and nuclear regulators in other countries, CNSC faces difficulties in recruiting scientific and technical staff. At May 2000 the organization had 54 vacant positions — 29 in the power reactor business line. Some positions have been vacant for more than a year, and vacancies of 3 to 10 months are common. As an example, during the past year there were seven vacant positions for inspectors. Although the CNSC's recruiting efforts generated 351 applications, the five offers it made were rejected. Five positions have since been filled through redeployment; two remain vacant. In fiscal year 2000 there were 28 new staff hired, and 16 internal moves took place within the power reactor business line.

27.34 The CNSC has streamlined its processes, initiated some new recruiting activities, and developed other means to help retain staff, such as policies for retention bonuses and career development and training programs. However, it has not developed a formal recruiting strategy and action plan to give priority and direction to its efforts at filling the technical and other staff vacancies. The present vacancy rate (about 12 percent overall; 8 percent in the power reactor regulation business line) and the lengthy periods of vacancies in technical positions have a significant impact, in our view, on the CNSC's ability to effectively inspect and regulate the nuclear industry, despite management's efforts to reduce that impact. Some key areas are understaffed at a time when the workload is particularly heavy. The lack of staff has contributed to delays in

CNSC relies heavily on the knowledge and competence of its staff.

The 8 percent vacancy rate in the power reactor business line and the lengthy time required to fill vacancies have a significant impact.

Of 74 managers, 31 could elect to retire within the next five years.

At the time of our audit, roles and accountabilities of site project offices and headquarters technical specialists were not clear.

completing plans for relicensing some power reactor plants.

27.35 CNSC needs to develop a formal recruitment strategy and action plan to overcome the deficit in staff and ensure that the organization possesses the skills and expertise to fulfil its mandate.

Succession planning is a priority

27.36 The employee population in the CNSC is aging: according to data provided by CNSC, at April 1999 the average age was 45 years, identical to the public sector regulatory/inspection community but higher than the general public service population at 42 years. Also, 31 of 74 managers could choose to retire within the next five years.

27.37 Depending on how many retire, the CNSC could face not only loss of leadership but also loss of the high-level expertise that the current group of executive managers and other senior staff have acquired over many years, including experience with the industry. Moreover, the potential attrition by retirement at other levels across the organization heightens the need for a formal recruitment strategy and action plan that takes full account of the future staff needs resulting from attrition.

27.38 Succession planning was identified as a priority in the 1999–2000 human resources program and was split into phases. The first phase identified a talent pool for director-level positions. The next phase was scheduled for fall 2000 and would target the management level immediately below.

27.39 We encourage the CNSC to continue its succession planning efforts and complete its strategy and action plan for recruitment, based on historical and potential attrition rates.

27.40 **The CNSC should develop a human resource planning process that profiles present internal resources and forecasted needs, identifies historical,**

present and potential attrition rates, and assesses the implications of various policies on the distribution and movement of employees. It should update the human resource plan regularly and link it to the maintenance and administration of a formal plan for recruitment.

CNSC's response: The CNSC recognizes that in the past, human resources planning may not have been conducted as rigorously as it should have been. The CNSC agrees with the intent of the recommendation and has already put into place a human resources planning process. The CNSC believes that its Strategic Plan has been very clear on this point, and it will endeavour to strengthen linkages between the strategic, corporate and budget planning processes and the human resources plan.

Roles and accountabilities need to be clarified

27.41 Until 1998, the CNSC was structured in such a way that the site project office at each nuclear power reactor site co-ordinated much of the regulatory activity related to planning and conducting evaluations of performance of power reactor facilities. In January 1998, the CNSC initiated changes to improve its planning, integration, and reporting of regulatory activities related to the licencing of power reactors. A new division was formed to manage the review of reactor facility design, construction, operation, and maintenance; integrate the information generated by all relevant CNSC activities; and advise senior management and the members of the Commission on the overall performance of each nuclear facility.

27.42 At the time of our audit, the respective roles and accountabilities of the site project offices and the headquarters technical specialists were not clearly defined and understood. For example, the staff at site project offices are unclear on who is responsible for taking the lead on

specific issues. In the absence of clear accountability, assumption of the lead role is often ad hoc, and various groups play a role in evaluation and assessment. The lack of a clear understanding and effective implementation of the centralized approach to planning and reporting has allowed for the fragmenting of accountabilities and made it difficult to reach consensus on the overall level of safety at each nuclear facility.

27.43 The CNSC comprises five members of the Commission, including the President, appointed by the Governor in Council. The President is the chief executive officer and directs the work of both the members of the Commission and CNSC staff. The President chairs meetings of the members of the Commission. Many of the people we interviewed noted that senior management is responsible for developing regulatory philosophy and documents, but has had difficulty dealing with key issues. This has led to long delays in implementing change. Others we interviewed cited a lack of understanding between members of the Commission and CNSC staff on some regulatory issues.

27.44 While there is a need to maintain the regulatory independence between the staff and members of the Commission, we believe that clarifying roles and accountabilities by separating the position of chair of the meetings of members of the Commission from that of chief executive officer could improve the efficiency of the CNSC's operations and help it to demonstrate its effectiveness.

27.45 The CNSC should clarify the roles and accountabilities for planning

and integrating regulatory activities and reporting on licensee performance, and communicate them internally and to licensees. In addition, it should consider separating the role of chair from that of chief executive officer.

CNSC's response: The CNSC agrees that, to improve accountability and regulatory effectiveness, effort is needed to improve the implementation of the roles and responsibilities for planning and integrating regulatory activities and reporting on licensee performance. A review of roles and responsibilities has been planned. It will be followed by action to communicate and manage implementation of the resultant responsibility framework. The separation of chair and CEO is not our preferred solution to some of the issues raised. However, we will take it into consideration in addition to other options.

Conclusion

27.46 The public places a high reliance on the regulator of nuclear power facilities, and the CNSC is committed to operating in an open and transparent fashion. In our view, if CNSC strengthens its risk analysis and assessment, completes the changes it has begun in compliance and enforcement, and takes steps to ensure that it has the human resource capacity it will need in the future, the regulatory regime for power reactors will be designed, structured, organized and implemented to achieve its safety objective and other objectives.

Separating the position of chair from that of chief executive officer could improve CNSC's operations.



About the Audit

Objectives

Our objectives for the audit were to:

- assess whether the regulatory regime for power reactors has been satisfactorily designed, structured, organized and implemented to achieve its safety and other objectives, for example, cost recovery; and
- identify factors or constraints that affect the development or implementation of regulatory regimes. These may include delays in legislative changes, overlaps with provincial jurisdictions, downsizing, and the effects of international harmonization of regulatory approaches.

Scope and Approach

We conducted structured interviews with 88 people, including senior executives in CNSC and industry. We visited three licensees at four plant sites and also visited the Nuclear Installations Inspectorate in the United Kingdom. In addition, we reviewed more than 250 documents. Our audit was conducted between October 1999 and July 2000.

Criteria

With respect to the audit objectives, we assessed the regulatory regime for power reactors against the following audit criteria.

Regulatory programs should be designed, organized and implemented based on:

- a comprehensive analysis of health and safety risks and sufficient staff, expertise and resources;
- a comprehensive analysis of alternative regulatory regimes to address identified risks, including an assessment of the capabilities of industry and government, consultations with stakeholders, costs and benefits, and policies for maintaining transparency and public access to information;
- a clear statement of the respective responsibilities of government, industry and other parties and ongoing consultations with stakeholders;
- a clear statement of guiding ethical principles and a conflict-of-interest policy;
- clear and comprehensive performance objectives or goals for each of the areas subject to regulation;
- clearly defined key performance data, specifications for measurement procedures and data to be used, and clear policies for government to have timely and unimpeded access to all necessary data;
- clear policies for the establishment of cost-recovery or regulatory fees;
- clear policies and procedures for ensuring compliance and enforcement of Canadian laws and international standards (to which CNSC has agreed), for resolving complaints and for reporting and remedying regulatory failures, including any penalties that may be imposed;
- effective departmental accountability and review structures, for example, audit, evaluation, performance measurement, complaint resolution, that are consistent with the regulatory approach adopted; and
- clear, accurate, comprehensive and timely reporting to management and Parliament on the relevance of regulations, their effectiveness, and the cost of the programs.

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