

May 23, 2002

MEMORANDUM TO: Chairman Meserve  
Commissioner Dicus  
Commissioner Diaz  
Commissioner McGaffigan  
Commissioner Merrifield

FROM: Janice Dunn Lee, Director */RA/*  
Office of International Programs

SUBJECT: VISIT OF PRESIDENT LINDA KEEN, CANADIAN NUCLEAR  
SAFETY COMMISSION, MAY 29, 2002

Ms. Linda Keen, President of the Canadian Nuclear Safety Commission (CNSC), will visit the NRC on Wednesday, May 29, 2002. The purpose of her visit is to observe a Commission meeting, meet with the Chairman and available Commissioners, and sign the first renewal of the NRC-CNSC Administrative Arrangement on nuclear regulatory matters.

Included in Ms. Keen's suggested discussion topics (Attachment 1), she has specifically identified the Commission's February 26 Interim Compensatory Measures issued to formalize enhanced security requirements at U.S. nuclear power plants. To facilitate a discussion of this issue, in a separate paper, the staff is requesting that the Commission authorize discussions with her to include safeguards information.

Attached are the meeting schedule, biographical information, country summary, and talking points for use during the visit.

Attachments: 1. Commission Schedule  
2. Biographical Information  
3. Country Summary  
4. Background Information and Talking Points

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**VISIT TO NRC OF  
MS. LINDA KEEN  
PRESIDENT  
CANADIAN NUCLEAR SAFETY COMMISSION**

**May 29, 2002**

SCHEDULE

9:30 a.m. Attend the Commission meeting on Briefing on the Status of New Reactor Licensing Activities  
12:00 noon Meet with Chairman Meserve  
12:30 p.m. Signing Ceremony of the renewal of the NRC-CNSC safety arrangement (18 fl. conference room)  
12:45 p.m. Chairman-hosted lunch  
1:45 p.m. Meeting with Commissioner Diaz  
2:45 p.m. Meeting with Commissioner McGaffigan  
3:30 p.m. Meeting with Commissioner Merrifield

BIOGRAPHICAL INFORMATION:

Ms. Linda Keen (Attachment 2)

PREVIOUS CONTACT WITH THE COMMISSION:

Ms. Keen is a regular member of INRA and attends the IAEA General Conference. This is her first visit to NRC.

ACCOMPANYING PERSONS:

Kenneth Pereira, Vice President, Operations Branch, CNSC  
Kenneth Wagstaff, Executive Director, Office of International Affairs, CNSC  
Robert Potvin, Executive Assistant to the President and Secretary of the Executive Committee, CNSC  
Carl Hartill, Science Officer, Canadian Embassy

DISCUSSION TOPICS TO BE RAISED:

- Nuclear Fuel Waste Disposal
- MAPLE/NPF Licensing and Related NRC Export Licensing
- Nuclear Security and Emergency Preparedness
- Implementation of the Additional Protocol
- other general regulatory topics could be covered during the luncheon such as CNSC restructuring and privatization of the Canadian nuclear industry

**Biographical Information: Ms. Linda J. Keen**

Linda J. Keen is the President and CEO of the Canadian Nuclear Safety Commission (CNSC). She was appointed a full-time Commissioner, effective November 1, 2000. She assumed duties as President and CEO of the CNSC on January 1, 2001. 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.

As President of the Commission, Ms. Keen presides over a quasi-judicial federal tribunal that is responsible for making licencing decisions in an impartial manner. She is dedicated to ensuring a high degree of openness and transparency in all aspects of nuclear regulation, including the public hearing process. As CEO of the staff organization, Ms. Keen has charted a course for the CNSC to become a world-class regulator that is recognized for its regulatory efficiency and effectiveness. She will also ensure that the CNSC is recognized as a preferred career choice that attracts the best and the brightest within the nuclear field.

Prior to her Governor in Council appointment as President and CEO of the CNSC, Ms. Keen held positions as Assistant Deputy Minister at Natural Resources Canada and Human Resources Development Canada. Ms. Keen has over twenty years of experience in senior management positions within the federal and provincial public service. She has been responsible for program and policy development in the science, technology, and resource sectors, as well as for employment programs. Ms. Keen also has extensive experience in trade policy and international marketing and development.

Born in Alberta, she holds a Bachelor of Science (Chemistry) and a Masters of Science (Food and Nutrition Sciences) from the University of Alberta.

## **CANADA NUCLEAR PROGRAM**

### **Nuclear Power**

Three utilities (New Brunswick Power, Ontario Power Generation, and Hydro Quebec) account for some 92% of the electricity generated in Canada. The balance is provided by some 60 industrial self generators and a few independent power producers (IPPs).

In this energy mix, these utilities operate 21 pressurized heavy water (PHWR) nuclear power generating stations, generating 15,149 MWe. Nuclear accounts for 16.4% of Canada's energy mix. No additional nuclear plants are planned or under construction.

### **Nuclear Fuel Cycle**

Canada has an extensive nuclear fuel cycle and has commercial scale conversion, fuel fabrication and heavy water production facilities. It is by far the world's largest uranium producer.

### **Waste Management**

The overall regulation of nuclear reactor waste is the responsibility of the Canadian Nuclear Safety Commission (CNSC).

Low-level waste is compacted and incinerated to reduce volume, and then stored in concrete buildings located on the reactor site.

Canadian reactors produce more than 60,000 used fuel bundles each year. After online and remote control removal from the reactor by fueling machines, used fuel bundles are stored on-site to cool. The spent fuel pools have a 15-20 years of storage capacity. After about 10 years, and the bundles have cooled, they are transferred to dry storage facilities. The dry storage containers have a design life of 50 years. Options for long term storage are still being studied; however, a start date of 2034 was set to begin the deep geological storage of high level wastes.

### **Research and Development**

Atomic Energy Control Limited (AECL) is Canada's premier nuclear research organization. Its main facility, the Chalk River Laboratories, is located 120 miles northwest of Ottawa. The Commission has visited AECL facilities.

### **Nuclear Regulatory Structure**

On May 31, 2000, the Nuclear Safety Control Act established the Canadian Nuclear Safety Commission (CNSC). It replaced the Atomic Energy Control Board that was established in 1946. Its mission is to regulate the use of nuclear energy and materials to protect health, safety, security, and the environment. This includes controlling the import and export of nuclear materials.

## **NON-PROLIFERATION**

Canada is a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and has an agreement with the IAEA for the application of full-scope safeguards to its nuclear program. It also subscribes to the Nuclear Suppliers Group (NSG) Guidelines, which set forth standards for the responsible export of nuclear commodities for peaceful use, and to the Zangger (NPT Exporters) Committee Guidelines, which oblige members to require the application of IAEA safeguards on nuclear exports to non-nuclear weapon states. It is a party to the Convention on Physical Protection of Nuclear Material.

## **RELATIONS WITH THE NRC**

### **Bilateral Arrangements and Agreements**

Canada ranks among the closest and most important U.S. partner in civil nuclear cooperation, with ties dating back to the early days of the Atoms for Peace Program.

The original NRC/Canadian MOU, signed on June 21, 1989 at the Canadian Embassy in Washington, was last renewed for a five-year period on August 15, 1996. The current bilateral has expired, but both sides agreed to continue cooperation until a renewal can be signed.

NRC (NRR and RES) collaboration under the MOU is very active. On June 1, 2000, NRR Director Samuel Collins met with the CNSC to initiate annual bilateral discussions. There is also an active dialog between the NRC and the CNSC on nuclear facility security.

### **Trilateral**

In February 2002, representatives from Canada, Mexico, and NRC (NMSS and OIP) met in Washington to discuss matters related to illicit and lost nuclear materials and radiation sources. Other discussion topics included:

- institutional control for large volumes of long lived radioactive material;
- joint Convention on spent fuel and radioactive waste management; and
- additional items to be determined by the Canadians and Mexicans.

This was the first such trilateral meeting for the three regulatory bodies. All parties found the meeting to be very useful and agreed to meet on an annual basis (Mexico offered to host the next meeting in 2003).

### **Recent Commission Visits**

Commissioner Merrifield, August 2000

Chairman Meserve, June 2000

Chairman Jackson, February 1999

### **Foreign Assignees**

There have been no requests by the Canadian government to place assignees with the NRC. However, there is regular contact between the NRC and CNSC technical staff. In addition, CNSC staff attend training at the NRC Technical Training Center in Chattanooga, TN.

### **NRC Licensed Exports**

NRC licensed exports to Canada have included HEU and LEU materials and fuel components. No Part 810 cases have been reviewed for Canada in the last several years. However, in 1999 there was a DOE distribution of MOX test samples to Canada for a one-time test as part of the PARALLAX Program (an investigation into the feasibility of using CANDU reactors to burn surplus US and Russian military PU.)

## **Background Information and Talking Points**

### **Nuclear Fuel Waste Disposal**

#### *Background*

NRC is involved in a wide range of routine regulatory activities in the nuclear waste area. Currently, NRC is focusing particular attention on the High-Level Waste Disposal issue (Yucca Mountain) and the Joint Convention on Spent Fuel and Radioactive Waste Management.

With respect to Yucca Mountain, Congress is currently reviewing the President's proposal (in support of DOE's recommendation) to designate Yucca Mountain as the site for disposing of high level waste from U.S. power reactors, pursuant to the Nuclear Waste Policy Act of 1982. In anticipation of possible Congressional action to approve the President's proposal, NRC has conducted extensive preliminary work related to the Commission's responsibilities to exercise U.S. Government regulatory oversight over Yucca Mountain. NRC has concluded that DOE has, or will have, sufficient information to prepare a license application for submission to NRC. NRC has also identified several "Key Technical Issues," (KTI's) that will require resolution as a part of the licensing process. This process will require several years to complete.

The Joint Convention on Spent Fuel and Radioactive Waste Management remains before the Senate for ratification. It was sent to the Senate by President Bush on September 13, 2000. Senate approval has been delayed, but is still expected. The Joint Convention is non-controversial and has broad support from cognizant U.S. Government Agencies, including NRC. The Convention will provide the U.S. with an enhanced opportunity to participate in activities that will strengthen the worldwide safety culture in the radioactive waste disposal area. Canada has a well-developed waste disposal program. With respect to power reactor spent fuel, Canada reached a decision several years ago that relies on long term dry storage in the immediate vicinity of the power plants.

#### *Talking Points*

- The Commission may wish to note the importance of continued information sharing with Canada.
- Inquire about status of waste disposal issues in Canada, including plans for dry storage at CANDU reactor sites.

### **MAPLE/NPF Licensing and Related NRC Export Licenses**

#### *Background*

Atomic Energy of Canada Limited (AECL) is under contract to the private company to construct the MAPLE 1 and 2 Reactors and the New Processing Facility (NPF). Nordion supplies over 50% of the world's medical isotopes, which are used in some 34,000 medical procedures daily including 60% of those performed in the U.S. Dramatic increase in demand for medical



isotopes convinced Nordion that single-purpose, state of the art, facilities were needed for long term reliability and to compete more vigorously with suppliers whose facilities are used in various capacities and require HEU for fuel as well as for targets.

In August 2000, failure of the MAPLE 1 reactor shut-off system triggered CNSC discovery of serious management/QA problems. AECL was ordered to cease start-up testing, completely review and revalidate all major systems and overhaul management QA oversight procedures. Formal public hearings were held before the Commission to air the outstanding issues and AECL actions necessary to address problems. After the December 2001 public hearing, the Commissioners concluded that the public hearings had served their purpose and delegated authority to render decisions on MAPLE re-start testing activities to CNSC staff.

Currently, AECL's only back-up source for producing medical isotopes is the NRU, a multi-purpose research reactor operating for more than 40 years. After arguing that extended use of NRU was impossible due to waste handling constraints, AECL's credibility suffered when problems with MAPLE reactors surfaced and it was forced to rely on the NRU. Neither CNSC nor AECL are comfortable with the NRU situation, but disrupting the supply of medical isotopes would be devastating.

Presently, NRC is reviewing the second amendment (XSNM03171/02) to add 10 kg HEU to the amounts previously authorized and to extend the expiration date of this export license, which supports medical isotope production in the NRU. Another active NRC export license authorizes export of HEU targets for the MAPLE reactors (XSNM03060). Shipments of HEU targets for the MAPLE reactors were made in 2000 and 2001, subject to the relevant export license conditions. AECL estimates that it has an inventory on hand sufficient for approximately two years and will be consulting with NRC on shipments for 2002.

#### *Talking Points*

- Physical Security Measures for HEU Shipments: The two most recent HEU exports (approximately 5 kg each) to AECL for NRU targets were made on December 20, 2001, and April 16, 2002, by a commercial carrier (Transnuclear) with Category II physical security measures. Recently, DOE representatives who are not usually involved in the Executive Branch review of export licenses urged use of SSTs for upcoming HEU shipments to Canada. At this point (May 21) DOE has not made a formal recommendation to NRC on their decision. NRC is sensitive to AECL scheduling issues and will seek to avoid taking actions that might disrupt medical isotope production. The Commission may want to raise the matter of physical security measures for HEU shipments.
- After the last CNSC public meeting on the MAPLE reactor and NPF held in December 2001, it was reported that shut-off rods (SOR) malfunctioned. The Commission may wish to inquire whether it was an accurate report?
- Has the cause of this SOR problem been identified?
- AECL recently projected that MAPLE 1 and NPF can be brought into commercial operation between March 2003 or June 2003. The Commission may wish to inquire whether the CNSC has any insights to share on AECL's progress and the validity of their schedule projections.

- Although this is a sensitive matter potentially affecting Nordion's relationships with its customers and its reputation as a reliable supplier, the Commission may want to inquire whether the CNSC is aware of any major operational problems that might preclude or disrupt medical isotope production using NRU?

## **Nuclear Security and Emergency Preparedness**

### *Background*

NRC continues to coordinate closely with the Office of Homeland Security (OHS) and other relevant U.S. Government Agencies on post 9/11 security issues affecting NRC licensees, with a special focus on nuclear power plants. The recent establishment within NRC of the Office of Nuclear Security and Incident Response provides for a more focused Commission attention to security-related issues. Proposed enhancements to NRC's security related regulations are being coordinated with other interested U.S. Government Agencies; and NRC plans to consult also with our counterpart regulatory authorities abroad to ensure maximum uniformity of any revised security measures, particularly with respect to transportation related requirements that may involve cross border shipments.

NRC also supports efforts to enhance security on materials and facilities abroad to counter the terrorist threat. In particular, NRC supports the IAEA's proposed enhancements to its core activities that are relevant to counter-terrorism and believes that member States should provide additional funds to the IAEA to support these initiatives.

Canada has also conducted internal reviews of nuclear security related matters in the wake of 9/11. CNSC has been directly involved in these efforts and President Keen may be able to provide more information on these Canadian initiatives during her visit. As with NRC, the CNSC's initial efforts focused on nuclear power plant security issues.

### *Talking Points*

- The Commission may wish to inquire about the CNSC's recent activities in the nuclear security area.
- Inquire whether Canada supports providing additional funding to the IAEA for enhancements to the IAEA's nuclear counter-terrorism related activities.

## **Implementation of the IAEA Additional Protocol**

### *Background*

On May 9, the President submitted to the Senate for ratification the Additional Protocol between the U.S. and the IAEA, which provides for additional IAEA safeguards access rights to information and locations related to the U.S.'s peaceful nuclear programs. Canada has previously completed the ratification process for the Protocol and is now in the early stages of implementing the Protocol with respect to its entire nuclear program and related activities.

While the Additional Protocol is primarily intended to expand the IAEA's information base and access rights with respect to the nuclear programs of Non-Nuclear Weapons States (NNWSs), the U.S. has agreed (subject to Senate ratification) to allow the IAEA to implement the Protocol

in the U.S., except with respect to activities or locations of direct national security significance to the U.S. The IAEA plays an invaluable role in the fight against nuclear proliferation and adherence to the Additional Protocol will bolster U.S. efforts to strengthen nuclear safeguards and promote nuclear nonproliferation. The President's submission to the Senate reinforces longstanding U.S. support for the IAEA. NRC is now consulting with the relevant Executive Branch Agencies regarding the implementing details of each Agency's separate responsibilities under the Additional Protocol. NRC will be the lead Agency with respect to the Protocol's information collection and reporting requirements and access arrangements for IAEA inspectors to the extent they involve NRC or Agreement State licensees.

As part of its implementing strategy for the Additional Protocol, the IAEA Secretariat has developed an "Integrated Safeguards Concept" which contemplates a reduction in safeguards inspection expenses at non-sensitive declared activities (e.g., power reactors or other facilities not possessing nuclear material with direct weapons use) if adequate assurances can be provided regarding the absence of undeclared nuclear activities.

Earlier this year, the U.S. Government completed a high-level review of the IAEA's budget needs which concluded that there is an urgent need for IAEA member States to approve a significant increase in the IAEA's regular budget for safeguards purposes. This U.S. decision has been formally conveyed to our allies in the Geneva Group, which is the informal group of key donor States which provide the major portion of the IAEA's funding needs. Canada is a member of the Geneva Group and has indicated it will give serious consideration to the U.S. request for additional funding to the IAEA, despite Canada's longstanding position against any increase in the IAEA's regular budget ("Zero Real Growth," or ZRG). Until the recent review, the U.S. shared this position in support of ZRG. The Commission was an early supporter of seeking additional funding for the IAEA and the Chairman has agreed to assist the State Department, where appropriate, in lobbying other countries to support this U.S.-led initiative.

#### *Talking Points*

- The Commission may wish to inquire about Canada's initial experience in implementing the Additional Protocol.
- Has the IAEA been overly intrusive in its contacts with the CNSC?
- What is the workload impact on involved Canadian Agencies and on the private sector in Canada?
- What are your views on the IAEA's budget needs?
- Will the proposed implementation of the IAEA's Integrated Safeguards Approach (under the overall umbrella of the Additional Protocol), lead to any reductions in safeguards inspection expenses in Canada, such as at the CANDU dry storage facilities?
- Following full and active implementation of the Additional Protocol, will the IAEA be able to provide credible high confidence conclusions regarding the absence of undeclared activities in NNWSs?
- Does Canada see itself as a role model for other NNWSs with respect to granting the IAEA the necessary access to information and locations to provide such high confidence conclusions?