

**AECL Nuclear Laboratories  
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File# NRULE-00170-021-000

**Information and Request for Support for the  
One-Day Environmental Assessment Public Hearing on the  
Continued Operation of AECL's National Research Universal (NRU) Research Reactor**

Dear [Distribution List Attached]:

Further to previous discussions on this topic, I wish to formally advise you that AECL has sought approval from the Canadian Nuclear Safety Commission (CNSC) to operate the National Research Universal (NRU) reactor at our laboratories in Chalk River beyond its current licensing date of December 31, 2005.

As you know, NRU has been operating safely and reliably since 1957. Since the retirement of AECL's National Research eXperimental (NRX) research reactor in 1992, NRU continues to operate as Canada's only major materials and fuels testing reactor and as the principal reactor for the National Research Council's (NRC) Canadian Neutron Beam Centre. NRU consistently produces the majority of the world's medical isotopes including molybdenum-99 and several longer-lived isotopes such as Cobalt-60, which is used for cancer therapy. Production of these longer-lived isotopes will continue in NRU after the Dedicated Isotope Facility is fully operational. NRU is the workhorse of our industry and its operations therefore benefit us all.

In 1996, AECL made a voluntary commitment to the CNSC to cease operation of NRU by December 31, 2005. This commitment was neither safety nor reactor age related but rather stemmed from the then imminent approval and funding for a new replacement research reactor to be built at Chalk River. NRU's current license reflects this commitment and requires that the facility be shut down unless otherwise authorized by the CNSC.

As you will recall, a commitment to proceed beyond agreement in principle with the replacement research reactor did not materialize. Moreover, circumstances have changed. There is now an international drive to reduce carbon emissions and public acceptance has increased for the construction of new nuclear power plants and refurbishment of existing plants. Critical to this is the ongoing need for a research reactor and the ability to maintain existing development programs, not only for CANDU<sup>®</sup> but also for the NRC and other public policy programs. With this in mind, AECL has since revisited the case for continued operation of NRU, especially as:

- there is currently no Canadian research reactor replacement on the horizon;
- NRU plays a critical support role in the maintenance of existing programs for its commercial customers, the NRC and academia;
- NRU plays a critical support role in the development of the new Advanced CANDU Reactor (ACR™); and
- NRU consistently produces the majority of the world's medical isotopes including molybdenum-99 and several longer-lived isotopes such as Cobalt-60, which is used for cancer therapy. Production of these longer-lived isotopes will continue in NRU after the Dedicated Isotope Facility is fully operational.

To support the request to continue the operation of NRU beyond December 2005, AECL has established a specific Licensability Extension (LE) program. This program included comprehensive reviews of the safety and materials condition of the reactor and upgrades to systems and equipment. The results demonstrate that safe and reliable operation can be maintained for another 10 years or longer.

AECL and NRC are also exploring various options for longer-term solutions to meeting Canadian research reactor needs. The long-term options for maintaining this capability in Canada include conducting a major refurbishment of NRU and its experimental facilities for extended long-term operation to 2050 or designing and building a new multi-purpose research reactor to replace NRU.

As these longer-term options will be dealt with under a separate initiative led by NRC, the application for an extension of the current operating license should be considered as the first phase of a longer-term solution to AECL's and Canada's needs for a strong neutron source as well as to assist us in meeting the short- and intermediate-term needs of our customers and partners.

In this regard, AECL submitted a licensing application on April 15, 2005 seeking removal of the condition requiring us to cease operating NRU by December 31, 2005. In order for this application to be approved, an Environmental Assessment Screening is required. Public input on the Environmental Assessment Screening is being requested for consideration during a one-day hearing to be held at the CNSC's office in Ottawa on June 29, 2005. The public's intent to provide a written or oral submission (use the link [www.nuclearsafety.gc.ca](http://www.nuclearsafety.gc.ca) for more information) must be submitted to the CNSC no later than May 30, 2005.

In preparation for this hearing, AECL is advising you of the Environmental Assessment Screening process through this letter. In addition, a series of public information sessions will be conducted throughout the community in the coming weeks. NRU is a central facility for many of our programs so your opinion on its continued operation is important. The dates and locations for these public information sessions are noted below and your attendance and comments are most welcomed and would be greatly appreciated:

- Tuesday, May 24<sup>th</sup>, 2005, JL Gray Centre (Foster Room), Deep River, 7:00-9:00 PM

- Wednesday, May 25<sup>th</sup>, 2005, Petawawa Town Hall, 1111 Victoria Street, Petawawa, 6:00-8:00 PM
- Thursday, May 26<sup>th</sup>, 2005, Pembroke Public Library, 237 Victoria Street, Pembroke, 6:00-8:00 PM
- Monday, May 30<sup>th</sup>, 2005, Chapeau Municipal Hall, 75 Notre Dame, Chapeau, Quebec, 7:00-9:00 PM

Public input received through these initiatives and through our website will be included in our presentation to the CNSC and will be considered along with all other submissions provided.

Additional information on the importance of the operating extension being granted is attached to this letter. As always, our ultimate goal is to improve our operations for both our present and future generations without increasing any risk to our workers, the public or the environment. I will be pleased to address any comments or concerns that you may have. I thank you for your continued support for our projects. If you have any questions, please do not hesitate to call me at (613) 584-8811 ext. 4966 or at 1-800-364-6989.

Warm regards,



Donna Roach  
Manager

Att.

c. P.J. Fehrenbach  
P. Lafrenière  
D. See Hoye  
R. Leung  
G. Archinoff

J-P. Létourneau  
W.A. Shorter  
J. Arnold  
C. Nache, CNSC  
A. Alwani, CNSC

## **NRU Licensability Extension Program**

AECL proposes to continue operation of NRU past December 2005. Continuing assessments of the NRU facility through an Aging Management Program and the AECL business case will establish requirements for the continued operation of NRU. The objective of the NRU Licensability Extension (LE) Program is to demonstrate that the reactor will continue to operate safely, reliably, and in compliance with appropriate regulatory requirements, and to identify modifications for any future refurbishment.

It is essential to operate NRU past 2005 in order to continue supplying the majority of the world's medical isotopes and to support CANDU<sup>®</sup> and ACR<sup>™</sup> development. This also positions AECL to participate in proof testing future reactor concepts such as Generation IV.

### **Activities Undertaken by AECL in Support of the LE Program**

AECL is close to completing a thorough, wide ranging, and systematic review of topics pertaining to the safety of continued operation of the NRU reactor. This includes an evaluation of the Periodic Safety Review and the preparation of a Plant Life Management (PLiM) Program:

- A focussed Periodic Safety Review has been performed, and has compared NRU with modern safety standards for safety analysis and reactor design and operation. An interim report has been submitted to the CNSC, with a final report due by September 2005.
- A structured and comprehensive Plant Life Management (PLiM) Program is being implemented. The material condition of the most critical Systems, Structures and Components (SSCs) of the reactor is being examined as part of the PLiM Program. An interim report on the Condition Assessment has been submitted to the CNSC. The results of the NRU plant inspected so far indicate that no conditions have been found which adversely impact on the decision to extend operation of NRU. A final PLiM report incorporating additional work completed will be submitted to the CNSC in September 2005.

### **Program Objectives**

To ensure that NRU continues to operate safely and with minimal impact on its customers and beneficiaries, AECL has established three key goals relating to extending NRU's operation beyond December 2005:

1. to complete the seven NRU safety upgrades and maintain the reactor configuration consistent with the assumptions credited in the revised NRU Safety Analysis Report (SAR);
2. to demonstrate that the NRU reactor and its systems can be safely and reliably operated to current safety standards and licensing requirements; and
3. to ensure programs are in place to monitor, inspect, maintain, or replace Systems, Structures and Components (SSCs), important to safety, on an ongoing basis.

**Strategic Importance of NRU to AECL's Stakeholders and Users**

NRU serves a number of users and stakeholders. There are three broad categories of stakeholder and user needs. These are:

Commercial – NRU is an essential facility required for the consistent production of the majority of the world's medical isotopes, including molybdenum-99 and several longer-lived isotopes such as Cobalt-60, which is used for cancer therapy. Production of these longer-lived isotopes will continue in NRU after the Dedicated Isotope Facility is fully operational.

R&D – includes support for the ACR™ project, the existing CANDU fleet, and Nuclear Platform programs. It also includes future R&D programs such as those supporting the development of Generation IV technologies, especially Canadian participation in the international study of advanced reactor designs and especially a supercritical water reactor.

Public Policy – includes the National Research Council's Canadian Neutron Beam Centre.

Of major significance is the time required to design and construct a new replacement reactor. Should the license extension not be approved, AECL, the Canadian operating CANDU power reactors and the Canadian research community would be without a major neutron source and test reactor for at least a five to 10-year period. Direct consequences of this are:

- There will be a major shortage of medical isotopes worldwide;
- Planned R&D programs for the nuclear platform and legacy CANDU would not be completed before the NRU reactor shutdown thus jeopardizing re-licensing and life extension of Canadian operating CANDU power reactors;
- R&D programs for ACR™ would have to be hosted by foreign reactors at high cost; and
- National public policy and science programs could not be supported.

**Additional Background on the NRU Reactor**

The NRU reactor is a heavy-water moderated and cooled reactor. It operates under very benign conditions compared to those of power reactors. The reactor operates at a maximum heat output of 135 MW (thermal), and operates at a low pressure and temperature.

Since its initial commissioning, there have been a number of major modifications to NRU, including a vessel change in 1972.

A comprehensive safety review initiated in 1989 looked at the availability of shutdown capability, heat removal, confinement and reactor monitoring, particularly during and after seismic events. As part of that review an extensive inspection of the reactor and major components confirmed that the overall condition of NRU was sound and that it was being maintained and safely operated.

As a result of the review, the Engineering Safety Features were upgraded with designs that meet modern Codes and Standards. These safety upgrades are seismically and environmentally qualified and are a significant improvement in the safety capability of NRU.

A comprehensive NRU Safety Analysis Report (SAR) was completed in 2000 to modern International Atomic Energy Agency (IAEA) standards using up-to-date tools. The SAR has been reviewed by the AECL Safety Review Committee and by the CNSC. The expert opinion is that NRU is capable of continued operations well into the future.

The NRU reactor has operated safely and reliably for over 47 years. This is well documented in the NRU Reactor Annual Safety Reviews and in previous safety and engineering reviews, and is evidenced by performance improvements in several key areas.

**Continued Operation of NRU: Stakeholders List**  
**Letter issued April 25, 2005**

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| <p>Mrs. Cheryl Gallant, MP<br/> Renfrew-Nipissing-Pembroke<br/> Constituency Office<br/> 84 Isabella Street, 2<sup>nd</sup> Floor<br/> Pembroke, ON K8A 5S5</p> | <p>Mr. John Yakabuski, MPP<br/> Renfrew-Nipissing-Pembroke<br/> Constituency Office<br/> The Victoria Centre<br/> 84 Isabella Street<br/> Pembroke, ON K8A 5S5</p> |
| <p>Mr. David Smith, MP<br/> Pontiac<br/> House of Commons<br/> Ottawa, ON K1A 0A6</p>   | <p>Mme. Charlotte L'Écuyer, MLA<br/> Pontiac<br/> 1226, route 148, C.P. 100<br/> Campbell's Bay, QC J0X 1K0</p>  |
| <p>Warden Bob Sweet<br/> Renfrew County Council<br/> 9 International Drive<br/> Pembroke, ON K8A 6W5</p>  | <p>Mayor Ann Aikens<br/> The Town of Deep River<br/> P.O. Box 400<br/> Deep River, ON K0J 1P0</p>  |
| <p>Mayor Ed Jacyno<br/> The City of Pembroke<br/> 1 Pembroke Street East<br/> Pembroke, ON K8A 6X3</p>  | <p>Mayor Bob Sweet<br/> The Town of Petawawa<br/> 1111 Victoria Street<br/> Petawawa, ON K8H 2E6</p>   |
| <p>Reeve Bill Croshaw<br/> Townships of Head, Clara and Maria<br/> Stonecliffe, ON K0J 2K0</p>  | <p>Mayor Vance Gutzman<br/> The Town of Laurentian Hills<br/> 34465 Highway 17, R.R. #1<br/> Deep River, ON K0J 1P0</p>  |
| <p>Warden Michael McCrank<br/> Municipalité régionale du Comté de Pontiac<br/> C.P. 460, 602 Route 301<br/> Campbell's Bay, QC J0X 1K0</p>                      | <p>Mayor Denzil Spence<br/> Îles-aux-Allumettes<br/> C.P. 100<br/> Chapeau, QC J0X 1M0</p>   |
| <p>Mayor Paul Ryan<br/> Waltham<br/> C.P. 29<br/> Waltham, QC J0X 3H0</p>   | <p>Mayor Roy Perrault<br/> Sheen-Esher-Aberdeen-et-Malakoff<br/> Sheenboro, QC J0X 2Z0</p>   |

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| <p>Mayor Gerald Dagg<br/>Rapides des Joachims<br/>48 Church Street<br/>Rapides des Joachims, QC J0X 3M0</p>                         | <p>Mayor Donald Gagnon<br/>Chichester<br/>C.P. 100<br/>Chapeau, QC J0X 1M0</p>   |
| <p>Lt-Col. David Rundle<br/>Base Commander/CO ASU Petawawa<br/>CFB Petawawa<br/>Box 9999, Station Main<br/>Petawawa, ON K8H 2X3</p> | <p>Chief Kirby Whiteduck<br/>Algonquins of Pikwàkanagàn<br/>1657A Wishömis Inamo<br/>Golden Lake, ON K0J 1X0</p>                                       |
| <p>Mr. Ole Hendrickson<br/>Concerned Citizens of Renfrew County<br/>381 Maple Street<br/>Pembroke, ON K8A 1M4</p>                   | <p>Mr. Shawn-Patrick Stensil<br/>Energy and Climate Campaigner<br/>Greenpeace Canada<br/>Suite 605, 250 Dundas Street West<br/>Toronto, ON M5T 2Z5</p> |
| <p>Mr. Martin von Mirbach<br/>Sierra Club of Canada<br/>412-1 Nicholas Street<br/>Ottawa, ON K1N 7B7</p>                            |  |