

**Record of Proceedings, including
Reasons for Decision**

In the matter of

Atomic Energy of Canada Ltd. (AECL)

**Application to authorize the operation of the MAPLE 2 Reactor at the
AECL's Chalk River Laboratories**

**July 2000
Ottawa, Ontario**

CANADIAN NUCLEAR SAFETY COMMISSION

RECORD OF PROCEEDINGS

Applicant: Atomic Energy of Canada Limited

Address/Location: Chalk River Laboratories, Chalk River, Ontario

Purpose: Amendment to Non-Power Research Reactor Operating Licence
NPROL-62.1/2001 - to authorize operation of the MAPLE 2 Reactor

Application received: March 17, 2000

Type of hearing: 2 days

Date(s) of hearing: Day 1: April 26, 2000 Day 2: June 29, 2000

Day 1: April 26, 2000

Location: CNSC Offices, 14th Floor, 280 Slater St., Ottawa, Ontario

Members present: Dr. A.J. Bishop, Chair
Dr. C.R. Barnes
Dr. A.J. Carty
Dr. Y.M. Giroux
Mr. A.R. Graham

Counsel: A. Nowack

Secretary: G.C. Jack

Recording Secretary: B. Gerestein

Applicant Represented By	Document Number
<ul style="list-style-type: none">• J.-P. Labrie• V. Langman	BMD 00-56.1
CNSC Staff	Document Number
<ul style="list-style-type: none">• A. Aly• B. Pearson	BMD 00-56

Day 2: June 29, 2000

Location: CNSC Offices, 14th Floor, 280 Slater St., Ottawa, Ontario

Members present: Dr. A.J. Bishop, Chair
Dr. C.R. Barnes
Dr. Y.M. Giroux
Mr. A.R. Graham

Counsel: A. Nowack

Secretary: G.C. Jack

Recording Secretary: B. Gerestein

Applicant Represented By	Document Number
<ul style="list-style-type: none">• V. Langman• J.-P. Labrie• D. Taylor	CMD 00-H11.1
CNSC Staff	Document Number
<ul style="list-style-type: none">• A. Aly• B. Pearson	CMD 00-H11
Intervenors	Document Number
MDS Nordion, Kanata, Ontario <ul style="list-style-type: none">• G. Malkoske (written submission)• D. McInnes (in person)	CMD 00-H11.3
Nuclear Control Institute, Washington, D.C. <ul style="list-style-type: none">• A. Kuperman and P. Leventhal (written submission)	CMD 00-H11.2

Decision and Reasons:

Application: Approved: X Not Approved: _____

Date of Decision: June 29, 2000

Sent to applicant on: July 6, 2000

Sent to participants on: July 6, 2000

Reasons Issued: Yes: X No: _____
 _____ _____

Licence attached:

Yes: _____

No: X

CANADIAN NUCLEAR SAFETY COMMISSION

DECISION

CHALK RIVER LABORATORIES AMENDMENT TO NON-POWER REACTOR OPERATING LICENCE

1. Summary

In response to an application from Atomic Energy of Canada Ltd. (AECL), the Canadian Nuclear Safety Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends AECL's Non-Power Reactor Operating Licence NPROL-62.1/2001, to authorize the operation of the MAPLE 2 Reactor at the AECL's Chalk River Laboratories. This reactor will produce medical radioisotopes.

In reaching this decision, the Commission considered the submissions of Commission staff and the participants as set out in the material filed for the hearing as well as information provided by staff and participants present at the hearing. The Commission considered information submitted by the applicant and its evaluation by Commission staff. In addition, the Commission considered information received from two intervenors. One was MDS Nordion of Kanata, Ontario, and the other was the Nuclear Control Institute, based in the United States of America.

The Commission notes that the application is for an amendment to an existing licence which already permits operation of a facility like the one proposed. The Commission is satisfied with the information and submissions presented to it on the issues raised, and concludes therefore that the applicant is qualified to carry out the activity that the amended licence will authorize the licensee to carry on and that the applicant will, in carrying on the activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security, and measures required to implement international obligations to which Canada has agreed.

2. Issues

During the public hearing, the Commission heard submissions from the applicant and Commission staff related to several issues. The Commission's views on these are as follows.

2.1 Shutoff Rods

The MAPLE I reactor shutoff rods jammed on more than one occasion. The reasons for this malfunction were not determined or remedied until recently. The Commission accepts the

applicant's information that it was due to particles becoming loose from an improperly cleaned weld. The applicant has now cleaned off the welds and back washed the system, thereby removing any residual particles. The Commission is satisfied that these were the appropriate steps to prevent a recurrence.

2.2 Control Adjuster Rods

The Commission raised with the applicant and Commission staff problems that had arisen in the early stages of MAPLE 1 commissioning with the control adjuster rods jamming. The Commission heard concurring views from Commission staff and the applicant that the problem was again caused by particles from construction activities, and the Commission accepts this explanation and associated solution of cleaning and back washing.

2.3 Quality Assurance

The Commission heard concerns expressed by Commission staff about AECL's quality assurance program. The Commission reviewed the issue and was informed by the applicant at the hearing that they have now established a group of AECL staff reporting to the company's Chief Engineer to independently verify the adequacy of corrective measures. The Commission accepts the applicant's submission that this was an appropriate remedy.

2.4 Staffing and Training

The Commission accepts the applicant's submission that it will have a sufficient number of trained staff available within the facility to operate the facility safely in accordance with the licence, and to respond promptly to emergencies, even if both MAPLE 1 and MAPLE 2 operate simultaneously.

2.5 Intervenor Concerns

In its submission, an intervenor, the Nuclear Control Institute, raised issues arising from the use of highly enriched uranium (HEU) targets for irradiation in order to produce radioisotopes for medical uses, which is the prime function of the MAPLE reactors. The intervenor expressed a preference for the use of low enriched uranium (LEU) instead. The Commission notes that the licensing issue before it is not the production of radioisotopes per se, but the operation of a second reactor. The Commission further notes, however, that the entire safety analysis of the reactor and target assemblies is based on the use of HEU targets. The Commission accepts the submission that a change to LEU would require significant testing and evaluation in order to determine that heat transfer characteristics, for example, would remain acceptable. Since the environmental assessment done in 1997 was based on HEU targets, that assessment also could have to be revisited if LEU targets were to be used, which could cause a lengthy delay in starting production. The Commission heard from both the applicant and the Commission staff that the existing production of radioisotopes by the NRU reactor, which is not part of this application, cannot be

continued much past the end of this year due to regulatory limits imposed on the concentration of fissile material in the waste storage tank. The Commission explored the intervenor's suggestion that a minor modification might be possible to the pipework in the new radioisotope production facility that would simplify the conversion to LEU at a later date. The Commission accepted AECL's view that such a modification would be far from minor, and would endanger operating personnel due to the proposed pipework having to be installed above the workers' heads. The applicant reported that their business partner, MDS Nordion, the company that processes the targets to produce radioisotopes, had reserved a piece of land adjacent to its present facility, on which it could build a new processing facility in the future should that be needed. MDS Nordion representatives present at the hearing confirmed this, and stated further that they were cooperating with Argonne National Laboratory in the USA, and a contractor in France to explore options for changes to the processing facility. They further stated that they were engaged in research into alternative processes that might allow them to use the existing production facility with LEU target material at some time in the future (subject, of course, to regulatory requirements). The Commission notes that the applicant has always respected safeguards requirements concerning the protection of material such as HEU. It also notes that the control of the export of HEU from the USA is the responsibility of the United States Government. The Commission regulates the safety of nuclear facilities in Canada, however, and is satisfied that the use of HEU targets does not negatively affect safety. The Commission accepts that modifications now to the processing facility could negatively affect safety, and therefore does not accept the intervenor's request to withhold approval.

3. Conclusion

The Commission accepts the information set out in CMD 00-H11 and the submissions, conclusions and recommendations set out in that document. The Commission is therefore of the opinion, as required by section 24 of the *Nuclear Safety and Control Act*, that the applicant is qualified to carry out the activity that the amended licence will authorize the licensee to carry on and that the applicant will, in carrying on the activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security, and measures required to implement international obligations to which Canada has agreed.

George C. Jack
Secretary,
Canadian Nuclear Safety Commission

Date of decision: 29 June, 2000

Date of release of Reasons for Decision: 6 July, 2000