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BUREAU OF OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS

JAN 14 1961

MEMORANDUM FOR JAMES R. SHEA  
NUCLEAR REGULATORY COMMISSION

*XSNM01355  
HEU for  
Canada*

Enclosed is an Executive Branch analysis covering a license application for the export of highly-enriched uranium to Canada. In accordance with P.L. 95-242, the analysis explicitly addresses how the requirements of Section 126 a.(1) of the Atomic Energy Act are met, including the specific criteria of Sections 127 and 128, as well as certain additional factors, envisaged by Section 126 a.(1).

The Executive Branch, on the basis of its review of the application has concluded that the requirements of the Atomic Energy Act and P.L. 95-242 have been met and that the proposed export would not be inimical to the common defense and security of the United States. Moreover, Canada has adhered to the provisions of its Agreement for Cooperation with the United States. Therefore, the Executive Branch recommends issuance of the requested export license.

It is the understanding of the Executive Branch that shipment of the highly enriched uranium under this license request will be made in accordance with regulations set forth in 10 CFR 73 Physical Protection of Plants and Materials as supplemented by NRC requirements for category I shipments to Canada.

*Louis V. Nosenzo*  
Louis V. Nosenzo  
Deputy Assistant Secretary

Enclosure:  
As stated.

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## EXPORT LICENSE APPLICATION ANALYSIS

### XSNM01355

Country: Canada

Transaction: The export of 94.24 kilograms of U-235 contained in 101 kilograms of uranium enriched to 93.3 percent in the form of uranium metal for the production of fuel elements for the NRU, NRX and Slowpoke Research Reactors and for thorium fuel development

Applicant: Transnuclear, Inc.

Date of Application: July 28, 1978

#### Purpose of Export

This highly enriched uranium is intended for use in the NRU, NRX and Slowpoke research reactors and in the thorium fuel development program. The NRU and NRX research reactors, operated by Atomic Energy of Canada, Ltd. (AECL) at the Chalk River Nuclear Laboratories, are used for nuclear engineering in support of Canada's nuclear power program, for radioisotope production and for neutron physics. The Slowpoke reactors, located in Ottawa, Montreal, Toronto, Halifax and Edmonston, are used for neutron activation analysis and radioisotope production. The thorium fuel development program is aimed at investigation of fabrication techniques and irradiation testing of thorium-uranium fuels.

#### Special Non-Proliferation and Other Foreign Policy Considerations

The proposed export was approved by the President after review by the concerned Executive Branch Agencies of the NSC Ad Hoc Group determined that the request was within the scope of the President's HEU export policy, would not be inimical to U.S. common defense and security and met the requirements of the Atomic Energy Act, as amended by the Nuclear Non-Proliferation Act of 1978.

Argonne National Laboratory (ANL) has assessed the possibility of converting the NRU, NRX and Slowpoke reactors to the use of low-enriched uranium fuels and has concluded that conversion to 20 percent enriched fuel must await the availability of high density fuels currently under development.

Atomic Energy of Canada, Ltd. (AECL) at the Chalk River Nuclear Laboratories is actively engaged in a program to develop a low-enriched uranium fuel to replace the high enriched fuel currently used in the NRU and NRX reactors. The target date for conversion is 1986, assuming that a satisfactory replacement fuel can be developed.

#### Justification of the Need for HEU at this Time

The AECL program annually requires approximately 63 kilograms of uranium for the NRU, 33 kilograms U for the NRX and 3 kilograms U for the several Slowpoke reactors. The thorium fuel development program requires about 2 kilograms uranium annually. Inventory (fuel on hand or in process) as of July 31, 1980 was 152.06 kilograms uranium. Fuel fabrication lead time is 12 months. Therefore, the Executive Branch has concluded that the current HEU request is justified in terms of inventory and annual operating requirements taking into account the lead time required for fabrication.



Atomic Energy  
Control Board

Commission de contrôle  
de l'énergie atomique

OPERATIONS DIRECTORATE  
Safeguards & Nuclear  
Materials Branch

Your file / votre référence

Our file / Notre référence

11-2-3

25 August 1978

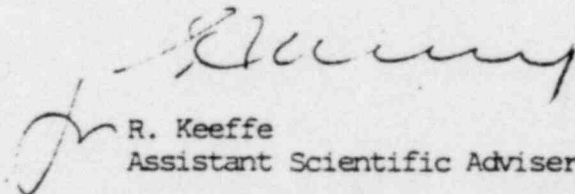
Mr. Vance Hudgins  
International Security Affairs  
U.S. Dept. of Energy  
Washington D.C. 20545  
U.S.A.

Dear Mr. Hudgins:

Regarding export application XSNM01355, I would like to confirm:

- (a) that the transfer of the material identified on said licence application, namely 94 kg U235 in 101 kg U (as U metal) will be subject to the terms and conditions of the Agreement for Cooperation Concerning Civil Uses of Atomic Energy Between the Government of Canada and the Government of the United States of America;
- (b) that the ultimate consignee, Atomic Energy of Canada Ltd., is authorized to receive and possess the material;
- (c) that physical security measures will be maintained with respect to the material so as to provide, at a minimum, the level of protection comparable to that set forth in INFCIRC/225/Revision 1.

Sincerely yours,



R. Keefe  
Assistant Scientific Adviser

PK/pn

## CANADA -- EXPORT LICENSE APPLICATION ANALYSIS

### 1. Applicable Agreement for Cooperation

The proposed export is subject to all of the terms and conditions of the Agreement for Cooperation between the Government of the United States of America and the Government of Canada concerning Civil Uses of Atomic Energy which entered into force on June 15, 1955, as most recently by the Protocol of July 9, 1980. This fact has been confirmed by a letter from the Atomic Energy Control Board of Canada, a copy of which follows the description of the license application.

Canada has adhered to all provisions of its agreement with the United States.

2. Extent to Which Export Criteria Are Met

A. Section 127 Criteria

As provided in Section 127 of the Atomic Energy Act, the following criteria govern exports for peaceful nuclear uses from the United States of source material, special nuclear material, production or utilization facilities, and any sensitive nuclear technology:

Criterion (1)

"IAEA safeguards as required by Article III(2) of the Treaty will be applied with respect to any such material or facilities proposed to be exported, to any such material or facilities previously exported and subject to the applicable Agreement for Cooperation, and to any special nuclear material used in or produced through the use thereof."

Canada is a Party to the Treaty on the Non-Proliferation of Nuclear Weapons and deposited its instrument of ratification on January 8, 1969. Canada's NPT safeguards agreement with the IAEA entered into force on February 21, 1972. Thus, IAEA safeguards are applied in Canada to all materials or facilities proposed to be exported, as well as to any such material or facilities previously exported pursuant to the U.S.-Canada Agreement for Cooperation and to any U.S.-supplied special nuclear material used in or produced through the use thereof.

Further, under Article XI A. of the Agreement for Cooperation, Canada has agreed to IAEA safeguards on all material "subject to the Agreement" and any source or special nuclear material used in or produced through the use of components subject to the Agreement.

Under Article X Bis A., the item proposed to be transferred, by virtue of the exchange of notification between Canada and the United States, will be subject to the Agreement. Under Article X Bis B. and C., source and special nuclear material produced through the use of source and special nuclear material subject to the Agreement and produced, processed or used by equipment and devices, major critical components or moderator material, are also subject to the Agreement. Under Article X Bis I, everything subject to the Agreement before the July 1980 Protocol remains subject to the Agreement as amended thereby. (The same coverage of "subject to the Agreement" is applicable to the analysis below concerning criteria (2) - (6).)

Therefore, it is the Executive Branch view that criterion (1) is met with respect to Canada.

Criterion (2)

"No such material, facilities, or sensitive nuclear technology proposed to be exported or previously exported and subject to the applicable Agreement for Cooperation, and no special nuclear material produced through the use of such materials, facilities, or sensitive nuclear technology, will be used for any nuclear explosive device or for research on or development of any nuclear explosive device."

As a Party to the NPT, Canada is committed not to develop or otherwise acquire nuclear explosive devices for any purpose.

Moreover, Canada has agreed under Article XII B. of the Agreement for Cooperation, that designated nuclear technology, material, equipment and devices, major critical components and components subject to this agreement and material used in or produced through the use of the foregoing, and over which Party has jurisdiction, shall not be used for any nuclear explosive devices or for research on or development of any nuclear explosive device.

Therefore, it is the view of the Executive Branch that criterion (2) is met.

Criterion (3)

"Adequate physical security measures will be maintained with respect to such material or facilities proposed to be exported and to any special nuclear material used in or produced through the use thereof. Following the effective date of any regulations promulgated by the Commission pursuant to Section 304(d) of the Nuclear Non-Proliferation Act of 1978, physical security measures shall be deemed adequate if such measures provide a level of protection equivalent to that required by the applicable regulations."

Under Article XII H. of the Agreement for Cooperation, Canada has agreed to the maintenance of adequate physical security measures, with respect to all material, equipment and devices subject to the Agreement, at levels in accordance with Annex A to the Agreement and with measures in accordance with such levels, which shall as a minimum provide protection comparable to that set forth in document INFCIRC/225/Rev.1. The Parties also agreed to consult periodically or at the request of either Party on physical security.

In 1975, a team of U.S. Government experts visited Canada for an exchange of views on physical security including visits to facilities at which highly-enriched uranium is stored and utilized. The fixed site reviews included: (1) security forces, (2) physical barriers, (3) detection and alarm apparatus, (4) communication and response capabilities, (5) access and exit controls, (6) accountability and reporting procedures and equipment for protecting nuclear materials in transit were also examined.

The Team judged Canada's physical protection system, equipment and procedures, including transportation security arrangements, adequate to physically protect the type of material (i.e. highly-enriched uranium) requested in the license application.

Therefore, it is the view of the Executive Branch that criterion (3) is met with respect to Canada.



Criterion (4)

"No such materials, facilities, or sensitive nuclear technology proposed to be exported, and no special nuclear material produced through the use of such material, will be retransferred to the jurisdiction of any other nation or group of nations unless the prior approval of the United States is obtained for such retransfer. In addition to other requirements of law, the United States may approve such retransfer only if the nation or group of nations designated to receive such retransfer agrees that it shall be subject to the conditions required by this section."

Article XII D. of the Agreement for Cooperation provides that: "Designated nuclear technology, material, equipment and devices, major critical components, components and Restricted Data subject to this Agreement and over which a Party has jurisdiction, shall not be transferred to unauthorized persons, or, unless the Parties agree, beyond the territorial jurisdiction of that Party."

Therefore, it is the Executive Branch view that criterion (4) is met.

Criterion (5)

"No such material proposed to be exported and no special nuclear material produced through the use of such material will be reprocessed, and no irradiated fuel elements containing such material removed from a reactor shall be altered in form or content, unless the prior approval of the United States is obtained for such reprocessing or alteration."

Article XII E. of the Agreement for Cooperation provides that "source and special nuclear material subject to this Agreement and over which a Party has jurisdiction shall not be reprocessed unless the Parties agree. Plutonium, uranium containing more than 12 percent of the isotope 233, uranium enriched to 20 percent or more in the isotope 235, or irradiated source or special nuclear material, subject to this Agreement and over which a Party has jurisdiction, shall not, unless the Parties agree, be altered in form or content, except by irradiation or further irradiation."

As Article XII E. clearly does not allow reprocessing or other alteration of U.S. origin material without the agreement of the United States, it is the view of the Executive Branch that criterion (5) is met with respect to Canada.

Criterion (6)

"No such sensitive nuclear technology shall be exported unless the foregoing conditions shall be applied to any nuclear material or equipment which is produced or constructed under the jurisdiction of the recipient nation or group of nations by or through the use of any such export sensitive nuclear technology.

Article X Bis E-H of the Agreement for Cooperation, and the related provisions in the Agreed Minute accompanying the July 1980 Protocol, ensure that any material or equipment which is produced or constructed under the jurisdiction of Canada through the use of any "designated nuclear technology" is subject to the Agreement. "Designated nuclear technology" is defined in Article XIV D. of the Agreement to cover "sensitive nuclear technology" as defined in Section 4(a)(6) of the Nuclear Non-Proliferation Act of 1978.

Thus, it is the view of the Executive Branch that criterion (6) is met with respect to Canada. However, the proposed export does not involve the transfer of sensitive nuclear technology. Criterion (6) is, therefore, not applicable in the case of this proposed export.

B. Section 128 Criterion

Section 128 a.(1) of the Atomic Energy Act establishes the following additional criterion: "As a condition of continued United States export of source material, special nuclear material, production or utilization facilities, and any sensitive nuclear technology to non-nuclear-weapon states, no such export shall be made unless IAEA safeguards are maintained with respect to all peaceful nuclear activities in, under the jurisdiction of, or carried out under the control of such state at the time of the export."

As a Party to the NPT, Canada has accepted IAEA safeguard on all its nuclear activities.

Further, under Article I Bis A. of the Agreement for Cooperation, Canada has agreed, as a requirement for cooperation under the agreement, to the application of IAEA safeguards with respect to all nuclear activities within Canada, under its jurisdiction or carried out under its control anywhere. The Parties agreed that implementation of Canada's NPT safeguards agreement shall be considered as fulfilling this requirement.

Therefore, it is the Executive Branch view that this criterion is met with respect to Canada.

3. Additional Factors

A. Safeguards Implementation

The IAEA Secretariat noted in its latest Safeguards Implementation Report that with regard to nuclear material subject to IAEA safeguards, no anomalies were detected which would indicate the diversion of a significant amount of safeguarded nuclear material for the manufacture of any nuclear weapon or any other nuclear explosive device. The Secretariat concluded that nuclear material under Agency safeguards remained in peaceful nuclear activities or was otherwise adequately accounted for. The Secretariat based its conclusion on improved safeguards approaches and extensive inspection activities which in 1979 included almost 1,000 inspections at over 500 installations in non-nuclear-weapon states. The Executive Branch has no reason to believe that the IAEA Secretariat's report is not valid. In the light of this and other factors associated with the proposed export, the Executive Branch believes the framework of commitments, assurances, and safeguards is adequate for the purpose of this export.

4. Inimicality Judgment

Based on review of the proposed export, it is the judgment of the Executive Branch that the proposed export will not be inimical to the common defense and security, and that the license should be issued.