October 16, 1997

For: The Commissioners

From: Carlton R. Stoiber, Director /s/
Office of International Programs

SUBJECT: PROPOSED RETRANSFER OF HIGH ENRICHED URANIUM (HEU) SCRAP FROM CANADA TO THE UK AND BACK TO CANADA FOR MEDICAL ISOTOPE PRODUCTION AT THE NRU REACTOR

PURPOSE:

To obtain the Commission's approval of a proposed response to the Department of Energy (DOE).

BACKGROUND:

DOE has forwarded for NRC review a proposed subsequent arrangement (Attachment 1) for the transfer of 25 kilograms of uranium scrap, enriched to 93.15 percent in the isotope uranium-235 (U-235), from Atomic Energy of Canada, Limited (AECL) in Chalk River, Canada, to the United Kingdom Atomic Energy Authority (UKAEA) in Dounreay, Scotland, for the purpose of recovering HEU which will then be returned to Canada within a 12-month period for use in AECL's NRU reactor as target material for the production of molybdenum-99 (Mo-99). (The retransfers will take place under the U.S.-Canada and U.S.-EURATOM Agreements for Cooperation.)

In 1991, an almost identical transaction was submitted by DOE for NRC review and was approved. This earlier transaction was discussed and presented to the Commission in SECY-91-171 for the outbound retransfer, and SECY-91-350 for the return to Canada.

Subsequently, in 1992, additional restrictions were placed on HEU exports by the Schumer amendments to the Energy Policy Act (Section 134 of the Atomic Energy Act). These restrictions allow the Commission to issue a license for the export of HEU to be used as a fuel or target in a nuclear research or test reactor only if, in addition to any other requirement of the Atomic Energy Act, the Commission determines that --

(1) there is no alternative nuclear fuel or target enriched in the isotope U-235 to a lesser percent than that of the proposed export, that can be used in that reactor;

(2) the proposed recipient of that uranium has provided assurances that, whenever an alternative nuclear reactor fuel or target can be used in that reactor, it will use that alternative in lieu of highly enriched uranium; and

(3) the United States Government is actively developing an alternative nuclear reactor fuel or target that can be used in that reactor.

The phrase "alternative nuclear reactor fuel or target" is defined to mean a fuel or target enriched to less than 20 percent in the isotope U-235. The phrase "can be used" is defined to mean that the fuel or target has been qualified by DOE's Reduced Enrichment Research and Test Reactor (RERTR) Program, and use of the fuel or target will permit the large majority of ongoing and planned experiments and isotope production to be conducted in the reactor without a large percentage increase in the total cost of operating the reactor.

These restrictions have been incorporated in NRC's export licensing regulations at 10 CFR 110.42(a)(9). The restrictions are also applied, as a matter of policy, to retransfers of HEU (*vice* direct exports) to assure that U.S. HEU is supplied on a consistent basis. A supplemental letter from DOE dated October 2, 1997 provides an analysis of the current request and concludes that the Schumer requirements are met (Attachment 2).

DOE's supplemental letter refers to a recent exchange of diplomatic notes between the U.S. and Canada agreeing to use alternative LEU targets in lieu of HEU targets once the LEU alternative is fully developed and available. DOE also refers to its commitment in 1995 "to fully fund the advanced fuel development program until its objectives are met" and advises us that the Department, through the Argonne National Laboratory, continues to actively develop the alternative LEU target. Copies of the U.S.-Canada diplomatic notes are at Attachment 3.

Department of Defense views are provided in a September 26, 1997, memorandum to DOE (Attachment 4). The accompanying DOD analysis addresses transportation and other aspects of the transaction in general terms from which may be inferred DOD's view, required by Section 133 of the Atomic Energy Act, on the adequacy of the physical protection of the HEU transfers to deter theft, sabotage and other acts of international terrorism.

DISCUSSION:

The HEU being transferred from Canada to the UK is in the form of scrap material. The majority of this scrap was generated in Canada during the production of HEU targets for the production of medical isotopes; the remainder is from fuel fabrication scrap. The processing will take place in a scrap recovery line at Dounreay's fuel fabrication facility.

Canada has been participating in the U.S.-sponsored RERTR Program to replace HEU with Low-Enriched Uranium (LEU) as fuel for research reactors and as targets for medical isotope production. Currently no LEU targets have been certified to replace HEU targets to produce the Mo-99 medical isotope. The Canadian Government has been working closely with DOE on the development of LEU targets. As noted above, DOE has committed funding to develop such LEU targets and the Canadian Government has agreed to use LEU targets once they are fully developed and made available. The NRC staff believes these actions and commitments satisfy the restrictions of the Schumer amendments.

The U.S. has previously granted consent, in the U.S-EURATOM Agreement, for the Dounreay site to process HEU. EURATOM will safeguard this nuclear material while it is at Dounreay.

The NRC threat assessment staff has reviewed the proposed retransfers of Category-I quantity of nuclear material in this case and do not object to the subsequent arrangement being granted.

SIDE NOTE:

The Office of International Programs export licensing staff expects to receive at least one license application in the near future requesting authority to export additional HEU from the U.S. to Canada for AECL's NRU reactor, also for Mo-99 production. Any such case will come to the Commission for approval as provided in 10 CFR Part 110.40(b)(2).

COORDINATION:

The EDO concurs in this paper. OGC has no legal objection.

RECOMMENDATION:

That the Commission approve the response to DOE at Attachment 5, indicating no objection to the proposed authorization.

Carlton R. Stoiber, Director
Office of International Programs

CONTACT: R. Hauber, OIP
(301) 415-2344

Attachments:
1. FAX fm T. Lee dtd. 9/24/97
2. Ltr fm C. Fitzgerald dtd. 10/2/97
3. Exchange of Notes dtd 10/6/97
4. Ltr to E. Fei fm D. Johnson dtd 9/26/97
5. Ltr fm R. Hauber to C. Fitzgerald