November 27, 2001

Dr. Robert U. Mulder, Director
Nuclear Reactor Facility
University of Virginia
P.O. Box 400322
Charlottesville, VA 22904-4322

SUBJECT: UNIVERSITY OF VIRGINIA RESEARCH REACTOR - ENVIRONMENTAL ASSESSMENT RE: AMENDMENT FOR APPROVAL OF DECOMMISSIONING (TAC NO. MA8186)

Dear Dr. Mulder:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for amendment of Facility Operating License No. R-66 for the University of Virginia Research Reactor submitted on February 9, 2000, as supplemented on April 26, June 6, and December 19, 2000, and May 4 and 11, 2001. The proposed amendment would approve the decommissioning plan for the University of Virginia Research Reactor.

The assessment is being forwarded to the Office of the Federal Register for publication.

Sincerely,

/RA/

Alexander Adams, Jr., Senior Project Manager
Operational Experience and
Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-62

Enclosure: Environmental Assessment

cc w/enclosure:
Please see next page

cc:

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629 East Main Street, Sixth Floor
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UNITED STATES NUCLEAR REGULATORY COMMISSION

UNIVERSITY OF VIRGINIA

DOCKET NO. 50-62

UNIVERSITY OF VIRGINIA RESEARCH REACTOR

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering the issuance of a license amendment to Facility Operating License No. R-66, issued to the University of Virginia (UVA or the licensee), that would allow decommissioning of the UVA Research Reactor located in the north portion of the UVA grounds near Charlottesville, Virginia.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action

By application dated February 9, 2000, as supplemented on April 26, June 6, and December 19, 2000, and May 4 and 11, 2001, the licensee submitted a decommissioning plan in accordance with 10 CFR 50.82(b), in order to dismantle the 2000-kilowatt (thermal) UVA Research Reactor, to dispose of its component parts and radioactive material, and to decontaminate the facility in accordance with the proposed dismantling plan to meet the Commission's unrestricted release criteria. After the Commission verifies that the release criteria have been met, Facility Operating License No. R-66 would be terminated. The licensee submitted an Environmental Report on February 9, 2000, dated February 2000, that was supplemented on December 19, 2000, that addresses the estimated environmental impacts resulting from decommissioning the UVA Research Reactor.

UVA ceased operating the reactor in July 1998. All the reactor fuel has been removed from the facility.

A "Notice and Solicitation of Comments Pursuant to 10 CFR 20.1405 and 10 CFR 50.82(b)(5) Concerning Proposed Action to Decommission the University of Virginia, University of Virginia Reactor" was published in the FEDERAL REGISTER on April 4, 2000 (65 FR 17684), and in the Charlottesville, Virginia daily newspaper, *The Daily Progress*, on April 23, 2000. One comment was received from the Director, Radiological Health, Commonwealth of Virginia, Department of Health, Radiological Health Program that "the proposed decommissioning plan appears to adequately ensure the return of the facility to unrestricted use without adversely affecting the public health and safety."

Need for the Proposed Action

The proposed action is necessary because of UVA's decision to cease operations permanently. As specified in 10 CFR 50.82, any licensee may apply to the Nuclear Regulatory Commission for authority to surrender a license voluntarily and to decommission the affected facility. Further, 10 CFR 51.53(d) stipulates that each applicant for a license amendment to authorize decommissioning of a production or utilization facility shall submit with its application an environmental report that reflects any new information or significant environmental change associated with the proposed decommissioning activities. UVA is planning to use the area that would be released for other academic purposes.

Environmental Impact of the Proposed Action

All decontamination will be performed by trained personnel in accordance with previously reviewed procedures, and will be overseen by experienced health physics staff. Solid and liquid waste will be removed from the facility and managed in accordance with NRC requirements. The operations are calculated to result in a total occupational radiation exposure of about

4 person-rem. Radiation exposure to the general public during decommissioning is expected to be negligible. This will be accomplished by keeping the public at a safe distance and by controlling effluent releases during decommissioning.

Occupational and public exposure may result from offsite disposal of the low-level residual radioactive material from the UVA Research Reactor. The handling, storage, and shipment of this radioactive material are to meet the requirements of 10 CFR 20.2006, "Transfer for Disposal and Manifest," and 49 CFR Parts 100-177, "Transportation of Hazardous Materials." It is anticipated that about 220 ft^3 (7 m^3) of irradiated hardware will be shipped during two truck shipments in Type B shipping casks to a waste processor. About 2700 ft^3 (76 m^3) of other waste in strong tight containers will be shipped during four truck shipments to a waste processor. Approximately 9700 ft^3 (275 m^3) of waste will be shipped in strong tight containers to the Envirocare of Utah facility in nine truck shipments. Included in these shipments will be mixed waste consisting primarily of activated and/or contaminated lead (43 ft^3 or 1.2 m^3) and cadmium (1 ft^3 or 0.03 m^3). Radiation exposure to the general public during waste shipments is expected to be negligible.

The NRC Final Rule on License Termination, 10 CFR 20.1402, provides radiological criteria for release of a site for unrestricted use. Release criteria for unrestricted use is a maximum Total Effective Dose Equivalent (TEDE) of 25 mrem per year from residual radioactivity above background. Application of the As Low As Reasonably Achievable (ALARA) principle is also a requirement. The results of the final survey will be used to demonstrate that the predicted dose to a member of the public from any residual activity does not exceed the 25 mrem per year dose limit.

Liquid waste that is generated during the decommissioning activities will be released to the environment in accordance with the regulations in 10 CFR Part 20, Subpart K, "Waste

Disposal," or will be solidified and disposed of as solid waste in accordance with state and Federal guidelines. Containment measures will be taken as necessary to minimize the spread of contamination. Engineered features such as enclosures and temporary barriers with high-efficiency particulate air filters will be used to control the spread of airborne radioactive material. Airborne releases of radioactive materials are not expected.

The licensee analyzed accidents applicable to decommissioning activities. The accident with the greatest potential impact on members of the public is the dropping of a waste shipping liner containing radioactive material. The maximum TEDE to a member of the public at the site boundary for this accident is about 43 mrem which is within the dose limits for members of the public given in 10 CFR Part 20, Subpart D, "Radiation Dose Limits for Individual Members of the Public."

Based on the review of the specific proposed activities associated with the dismantling and decontamination of the UVA facility, the staff has determined that the proposed action will not increase the probability or consequences of accidents, no changes are being made in the types of any effluents that may be released off site, and there is no significant increase in occupational or public radiation exposure. Therefore, the staff concludes that there are no significant radiological environmental impacts associated with the proposed action.

With regard to potential non-radiological impacts, the proposed action does not involve any historic sites. In addition to the lead and cadmium discussed above, asbestos is present at the UVA Research Reactor. Asbestos will be removed by a licensed asbestos abatement contractor. Decommissioning activities will not affect non-radiological facility effluents and have no other environmental impact. The licensee states that there are no sensitive or endangered species on the UVA Research Reactor site. Therefore, the staff concludes that there are no significant non-radiological environmental impacts associated with the proposed action.

Accordingly, the NRC concludes that there are no significant environmental impacts associated with the proposed action.

Alternatives to the Proposed Action

The four alternatives for disposition of the UVA Research Reactor are: DECON, SAFSTOR, ENTOMB, and no action. UVA has proposed the DECON option.

DECON is the alternative in which the equipment, structures, and portions of the facility containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use. SAFSTOR is the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use. ENTOMB is the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained; and continued surveillance is carried out until the radioactivity decays to a level permitting release of the property for unrestricted use. The no-action alternative would leave the facility in its present configuration.

The SAFSTOR, ENTOMB, and no-action alternatives would entail continued surveillance and physical security measures to be in place and continued monitoring by licensee personnel. The SAFSTOR and no-action alternatives would also require continued maintenance of the facility. The radiological impacts of SAFSTOR would be less than the DECON option because of radioactive decay prior to the start of decommissioning activities. However, this option involves the continued use of resources during the SAFSTOR period. The ENTOMB option would also result in lower radiological exposure than the DECON option but would involve the continued use of resources. UVA has determined that the proposed action (DECON) is the most efficient use of the existing facility, since it proposes to use the space that will become available for other academic purposes. These alternatives would have no significant environmental impact. In addition, the regulations in 10 CFR 50.82(b)(4)(i) only allow an

alternative if it provides for completion of decommissioning without significant delay. The environmental impacts of the proposed action and the alternatives are similar.

Alternative Use of Resources

This action does not involve the use of any resources not previously considered in the Environmental Report submitted on February 9, 2000, dated February 2000, as supplemented on December 19, 2000, for the UVA Research Reactor.

Agencies and Persons Contacted

In accordance with its stated policy, on November 6, 2001, the staff consulted with the Virginia State official, Leslie P. Foldesi, Director, Radiological Health, Commonwealth of Virginia Department of Health, regarding the environmental impact of the proposed action. The state official stated that he concurred with the environmental assessment and had no comments.

FINDING OF NO SIGNIFICANT IMPACT

On the basis of the environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the NRC has determined not to prepare an environmental impact statement for the proposed action.

For further details with respect to the proposed action, see the licensee's letter dated February 9, 2000, as supplemented on April 26, June 6, and December 19, 2000, and May 4 and 11, 2001, which are available for public inspection, and can be copied for a fee, at the U.S. Nuclear Regulatory Commission's Public Document Room (PDR), located at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. The NRC maintains an Agencywide Documents Access and Management System (ADAMS), which provides text and image files of NRC’s public documents. These documents may be accessed through the

NRC's Public Electronic Reading Room on the internet at http://www.nrc.gov. Persons who do not have access to ADAMS or who have problems in accessing the documents located in ADAMS may contact the PDR reference staff at 1-800-397-4209, 301-415-4737 or by email at pdr@nrc.gov.

Dated at Rockville, Maryland, this 27th day of November 2001.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Alexander Adams, Jr. Senior Project Manager
Operational Experience and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation