March 21, 2000

Donald J. Campbell, Director
NASA Glenn Research Center at Lewis Field
21000 Brookpark Road M.S. 3-2
Cleveland, Ohio 44135-3191

SUBJECT: PLUM BROOK REACTOR FACILITY DECOMMISSIONING PLAN ENVIRONMENTAL ASSESSMENT (TAC NOs. MA7791 AND MA7788)

Dear Mr. Campbell:

Enclosed is a copy of the Environmental Assessment and Finding of No Significant Impact related to your application for amendment dated December 20, 1999. The proposed amendment would change Facility Operating Licenses TR-3 and R-93 authorizing decommissioning of the Plum Brook Reactor and the Plum Brook Mock-up Reactor in accordance with the proposed decommissioning plan.

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

Sincerely,

/RA/

Marvin M. Mendonca, Senior Project Manager
Events Assessment, Generic Communications,
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-30 and 50-185

Enclosure: Environmental Assessment

cc w/encl: Please see next page

cc:

Ohio Department of Health
ATTN: Radiological Health Program Director
P.O. Box 118
Columbus, OH 43216

Ohio Environmental Protection Agency
Division of Planning
Environmental Assessment Section
P.O. Box 1049
Columbus, OH 43216

Ms. Celeste Lipp
Bureau of Radiation Protection
Ohio Department of Health
P.O. Box 118
Columbus, OH 43216

Ruth Vandegrift, Supervisor Decommissioning
Ohio Department of Health, Bureau of Radiation Protection
35 East Chestnut Street, 7th floor
Columbus, Ohio 43266

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UNITED STATES NUCLEAR REGULATORY COMMISSION

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

DOCKET NOS. 50-30 AND 50-185

PLUM BROOK REACTOR AND PLUM BROOK MOCK-UP REACTOR

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License Nos. TR-3 and R-93, issued to the National Aeronautics and Space Administration (NASA), the licensee. The license amendment would allow decommissioning of the Plum Brook Reactor and the Plum Brook Mock-up Reactor at the Plum Brook Reactor Facility (PBRF) near Sandusky, Ohio.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The PBRF consists of a complex of buildings with two non-power reactors. Both reactors have been shut down and defueled. The Plum Brook Reactor (Docket No. 50-30, NRC License No. TR-3) is a 60-megawatt materials test reactor, constructed to perform irradiation testing of fueled and unfueled experiments for space program application. The Plum Brook Mock-up Reactor (Docket No. 50-185, NRC License No. R-93) is a 100-kilowatt swimming-pool type reactor constructed to test “mock-up” irradiation components for the Plum Brook Reactor. The PBRF reactors were shut down in 1973. NASA currently has possession only licenses to possess the residual radioactive materials at the facility. All reactor fuel elements have been removed from the facility and the possession only licenses do not allow operation of the reactors.

NASA has proposed to decontaminate the facility to levels that would allow unrestricted release of the 11-hectare (27-acre) PBRF and termination of the licenses. The licensee submitted a decommissioning plan in accordance with 10 CFR 50.82(b) on December 20, 1999. Decommissioning, as described in the plan, will consist of transferring licensed radioactive equipment and material from the site and decontamination of the facility to meet unrestricted release criteria (this is called the DECON option, as described in NUREG-0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities"). While the decontamination work is in process, remedial action status surveys will be conducted to ensure that the contaminated material has been removed to levels below the limits required for unrestricted release (25 mrem/yr). Final status surveys will be conducted also. After the Commission verifies that the release criteria have been met, the reactor license will be terminated.

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 Plum Brook Reactor Facility" was published in the FEDERAL REGISTER (65 FR 12040) on March 7, 2000.

Further, 10 CFR 51.53(d) requires that each applicant for a license amendment to authorize decommissioning of a production or utilization facility must submit an environmental report that reflects any new information or significant environmental change associated with the proposed decommissioning activities. The licensee's environmental report is contained in Section 8 of the licensee's decommissioning plan.

The Need for the Proposed Action:

The proposed action is necessary because the licensee has decided to decommission the facility rather than other alternatives. As specified in 10 CFR 50.82, any licensee may apply to the NRC for authority to decommission the affected facility.

Environmental Impacts of the Proposed Action:

The NRC staff has evaluated the radiological impacts of the proposed action as presented in Section 8.5 of the decommissioning plan submitted on December 20, 1999, and concludes that the associated radiological effects of the decommissioning will be acceptable. The staff considered impacts on onsite workers, on transportation workers, and on the public, both during the decommissioning activities and after license termination.

The licensee has established controls to ensure occupational exposure remains below NRC regulatory limits for decommissioning personnel. The collective total dose equivalent to all onsite workers for all of the decommissioning activities is estimated to be about 70 person-rem over the approximate 4-year decommissioning project. This is less than the estimated occupational exposure of 344 person-rem presented in NUREG-0586 and is a result of the approximately 30 years of decay that has already taken place.

Occupational exposure associated with shipment of low level waste has been estimated at less than 18 person-rem. This is similar to the estimate of 22 person-rem for the reference test reactor presented in NUREG-0586 and, again, the lower dose can be attributed to the decay that has occurred since the reactors were shutdown.

The licensee concluded that the offsite public exposure would be small from routine release, based on the generic estimates of NUREG-0586 and on analyzed exposures for potential accidents (“the largest accident analyzed resulted in an offsite dose of about 0.5 mrem”). The licensee’s estimates for transportation related exposures were less than 8.2 person-rem and were also consistent with NUREG-0586, again considering the decay time since shutdown. The licensee has also established an As Low As Reasonably Achievable (ALARA) program to minimize exposure and must ensure that decommissioning activities will not exceed the limits in 10 CFR 20.1301, "Dose Limits for Individual Members of the Public."

The anticipated potential exposure to the public after license termination will be negligible. To be released for unrestricted use, the maximum dose to the "average member of the critical group" must be less than 25 mrem/yr. The actual dose to the public is expected to be much less than 25 mrem/yr because decontamination will be more extensive than that required to meet minimum license termination requirements and public exposure will not occur for some time because the licensee has no plans to make the site available for public reuse.

Based on its review of the specific proposed activities associated with the dismantling and decommissioning of the PBRF, the NRC staff concludes 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, 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. Non-radiological hazardous materials, including friable lead paint and asbestos insulation, will be managed as described in the decommissioning plan and transported offsite for disposal at a licensed burial site. The proposed action does not affect non-radiological plant effluents and has no other environmental impact. Therefore, there are no significant non-radiological environmental impacts associated with the proposed action.

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

Alternatives to the Proposed Action:

The three alternatives to the proposed action for the PBFR are SAFSTOR, ENTOMB, and no action.

SAFSTOR (safe storage) 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 (delayed decontamination) to levels that permit release for unrestricted use. Implementing this alternative would necessitate continued surveillance and maintenance of the PBRF over a period of time. Impacts during the storage period would be minimal, although there would be substantial monitoring and maintenance costs. Eventually, decontamination and decommissioning would be required. The radiological impacts of delayed decontamination and decommissioning would be comparable to, or slightly less than, those of the proposed action because of radioactive decay prior to DECON.

ENTOMB (entombment) is the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete. The entombed structure would be appropriately maintained and continued surveillance would be necessary over a substantial period of time until radioactivity decayed to a level permitting release of the property for unrestricted use. The time period necessary for entombment has been estimated to last for time frames on the order of a hundred years. The ENTOMB option would result in lower radiological exposure, but would require continued use of resources and would incur the costs associated with such long-term monitoring and maintenance.

The no-action alternative would leave the facility in its present configuration, SAFSTOR, and would limit the activities that the licensee could conduct on the site. However, the regulations in 10 CFR 50.82(b) only allow this condition to exist for a limited period of time.

The licensee has determined that the proposed action (DECON) is the most efficient use of the existing facility, because the SAFSTOR, ENTOMB, and no-action alternatives would entail continued surveillance, maintenance, and physical security measures to be in place and continued monitoring by licensee personnel. The alternatives would also entail the costs associated with these activities.

Alternative Use of Resources:

This action does not involve the use of any resources different from those previously committed for construction and operation of the PBRF.

Agencies and Persons Consulted:

In accordance with its stated policy, on January 21, 2000, the staff consulted with the State of Ohio official, Ruth Vandegrift, Supervisor Decommissioning for the Ohio Department of Health, Bureau of Radiation Protection regarding the environmental impact of the proposed action. The state official 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. The environmental impacts are expected to be bounded by the analyses in NUREG-0586. Accordingly, the Commission 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 December 20, 1999, which is available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC. It is also available at http://www.nrc.gov/OPA/reports under “What’s New on This Page,” “Decommissioning” or “Other Documents.”

Dated at Rockville, Maryland, this 21st day of March 2000.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Ledyard B. Marsh, Chief
Events Assessment, Generic Communications,
and Non-Power Reactors Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation