

November 21, 1996

Mr. Neal T. Saunders
Director of Aeronautics
NASA Lewis Research Center
21000 Brookpark Road M.S. 3-8
Cleveland, Ohio 44135

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION (TAC NO. M79569)

Dear Mr. Saunders:

We have reviewed your November 4, 1996, requests to amend License Nos. R-93 and TR-3 to extend or renew your current possession only status on your two non-operating non-power reactors. During our review, questions have arisen for which we require additional information and clarification. Please provide responses to the enclosed request for additional information within 30 days of the date of this letter. Following receipt of the additional information, we will continue our evaluation of your request.

This requirement affects nine or fewer respondents and, therefore, is not subject to Office of Management and Budget review under P. L. 96-511.

If you have any questions regarding this review, please contact me at (301) 415-1128.

Sincerely,

ORIGINAL SIGNED BY

Marvin M. Mendonca, Senior Project Manager
Non-Power Reactors and Decommissioning
Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-30 and 50-185

Enclosure:
As stated

cc w/enclosure:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

November 21, 1996

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Sincerely,

A handwritten signature in dark ink, appearing to read "Marvin M. Mendonca", is written over a horizontal line.

Marvin M. Mendonca, Senior Project Manager
Non-Power Reactors and Decommissioning
Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-30 and 50-185

Enclosure:
As stated

cc w/enclosure:
See next page

National Aeronautics and
Space Administration

Docket Nos. 50-30/185

cc:

Henry Pfanner
Manager, Plum Brook Reactor Facility
National Aeronautics and Space
Administration
Lewis Research Center
Cleveland, Ohio 44135

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

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

Ohio Department of Industrial Relations
ATTN: Chief, Boiler and Pressure
Vessel Division
P. O. Box 825
Columbus, Ohio 43216

REQUEST FOR ADDITIONAL INFORMATION
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
DOCKET NOS. 50-30 AND 50-185

Re: National Aeronautics and Space Administration (NASA) Plum Brook Reactor Facility (PBRF) "Request for Amendment to License TR-3, Docket No. 50-30 for Renewal of Possess-But-Not-Operate License" dated November 4, 1996

1. The cover letter indicates that the "renewal is requested to allow continued decay of existing radionuclides to lower total personnel exposure during decommissioning, and due to a lack of a dependably available nuclear low-level waste disposal facility." The letter goes on to say that "a condition of possess-but-not-operate with protected safe storage is appropriate to 1) minimize occupational exposures, 2) minimize risks to the public, 3) minimize radiological waste, and 4) develop suitable radiological waste disposal plans after delayed decommissioning." The regulations in this regard, 10 CFR 50.82(b)(4)(i), state that "[c]onsideration will be given to an alternative which provides for delayed completion of decommissioning only when necessary to protect the public health and safety. Factors to be considered in evaluating an alternative which provides for delayed completion of decommissioning include unavailability of waste disposal capacity and other site-specific factors affecting the licensee's capability to carry out decommissioning, including the presence of other nuclear facilities at the site." Provide analysis of radiological exposures and of the waste situation with supporting references and documentation to demonstrate that the proposed delay in decommissioning meets the regulation. Also, provide a schedule for completion of decommissioning and final termination of the license. Alternatively, provide plans for completion of decommissioning without significant delay.
2. The "Amendment to License No TR-3, Docket No. 50-30, General Information,"
 - a. item 5, "Period of Time for which License is Sought," specifies "[t]wenty years from date of issuance." This term of license is also specified in other locations in the renewal request. This extended time period is more typical for operating licenses vice possession only licenses. The last period for possession only was established as ten years. Provide additional justification for the extended time period or change to an appropriate lesser time period consistent with the requirement of 50.82(b)(4)(i) quoted above.
 - b. item 6, "Financial Qualification," states "[b]eing an agency of the United States' Government, NASA is financially qualified to possess the requested license." With regard to financial qualification, 10 CFR 50.82(b)(3)(ii) states that "[m]ean~~e~~ be included for adjusting cost estimates and associated funding levels over the storage or surveillance period." Provide means to meet this requirement. Further

10 CFR 50.75(f)(3) states "[i]f necessary, the cost estimate, for power and non-power reactors, shall also include plans for adjusting levels of funds assured for decommissioning to demonstrate that a reasonable level of assurance will be provided that funds will be available when needed to cover the cost of decommissioning." Provide plans to meet this requirement.

3. For all license, Technical Specification (TS), and Safety Analysis changes, provide indication of where the changes are with side bars and provide reasons for the changes. Some specific questions follow:
 - a. Item 1 of the "Proposed Amended Facility License" states that "[t]he PBRF is described in the application for full-term license dated January 10, 1964, and amendments thereto, including... Amendment 5... Amendment 6... Amendment 7... Amendment 8... Amendment 9... This Application." This application includes the "Bases and Safety Analysis for the Plum Brook Reactor Facility Protected Safe Storage Condition Attachment 1 to support request for amendment to License TR-3, Docket No. 50-30". Further, proposed TS 1.2 specifies that "[t]he PBRF is described in the Design Manual and Hazard Analysis submitted for the original PBRF license and now contained in Docket No. 50-30." Ensure that the safety analyses and facility descriptions are consistent in these documents. Provide a list of the exact documents and references that specify the design basis for the facility, and if any of these have not been previously provided to the NRC transmit them to the NRC with your response to this question.
 - b. Item 2 of the "Proposed Amended Facility License" does not specify possession of byproduct material under 10 CFR 30 as is the case under the current license, but rather propose byproduct possession under 10 CFR 50. Provide regulatory bases for this change or propose appropriate license wording that refers to 10 CFR 30.
 - c. Item 3 of the "Proposed Amended Facility License" does not indicate that 10 CFR 30.34 is contained as part of the license or that the license is subject to the conditions of 10 CFR 30.34, as is the case under the current license. Provide regulatory bases for this change or propose appropriate license wording that refer to 10 CFR 30.34.
 - d. Item 3 of the "Proposed Amended Facility License" added an item (C) that fuel will not be possessed without prior approval of the Commission. This item (C) is not specified in the current license. Considering that the license no longer authorizes possession of fuel under 10 CFR 70, provide rationale for this item or delete. If item (C) is still deemed necessary, the "and" should be deleted after item (A) and put after item (B), and a semi-colon should replace the period after item (B).

- e. Item 4 of the "Proposed Amended Facility License" should match the current license except for the change in amendment number, unless there is appropriate justification. The current license says:

The Technical Specifications contained in Appendix A, as revised through Amendment No. 8, are hereby incorporated in the license. The licensee shall maintain the facility in accordance with the Technical Specifications.

Note the NRC does not issue license amendments under the direct provisions of 10 CFR 50.59, but rather 10 CFR 50.59 can be used to determine if changes, tests or experiments require NRC review or not prior to implementation.

- f. Proposed TSs 1, 1.3.1, and 4, refers to ANSI/ANS 15.1-1982. The latest revision of this standard is 1990. Provide rationale to demonstrate that the reference is appropriate and applicable.
- g. The proposed TSs refer to and add Figure 1, a plot plan of the PBRF. Given this figure is added to the TS, no changes or variations from the configurations represented by this figure could be made without TS change. Provide rationale for the need for this figure in the TS and verify that configuration changes are not planned, or delete the figure from the TS. Alternatively, adding the figure to the safety analysis could allow changes by NASA if the provisions of 10 CFR 50.59 are satisfied.
- h. Proposed TS 2.12 and "Bases" refer to 10 CFR 20, Appendix B, Table II. These regulations have changed to Table 2 and with a different title. Provide the correct reference and title.
- i. Proposed TS 2.15.b indicates that radiological monitoring by written procedures described in TS 2.20(i). TS 2.20(f) specifies that facility radiological surveys be performed quarterly but does not specifically describe the procedures. Provide TS changes to accurately reflect the condition or rationale why the TSs are acceptable as they are.
- j. Proposed TS 2.18 "Bases" refers to "10 CFR 10" which appears to be a typographical error. Provide correction or reason for reference.
- k. The proposed TS 3.1.1, "Level 1 Directorate," adds a sentence that "The Directorate shall provide the resources to maintain the PBRF in protected safe storage." This requirement was formally met by the "Aeropropulsion Facilities and Experiments Division." It is also noted that Figure 1 was changed to eliminate the "Aeropropulsion Facilities and Experiments Division." Provide the reason for the changes.

- l. Proposed TS 3.1.2, "Internal Audit," states that "[t]he audit shall be performed by an audit committee chaired by a NASA employee. The remainder of the committee members may be NASA personnel or NASA contractor personnel, not directly associated with the facility, who have nuclear experience." This leaves the potential for the chair of the audit committee to be directly associated with the facility. Provide a description of the controls that ensure that (1) the chair of the audit committee is independent from any activity that the chair may audit, and (2) the audit committee members have sufficient independence and authority from the chair to perform audit and issue reports to the Executive Safety Board. Alternatively, include provisions in the TS that the chair of the audit committee is not directly associated with the facility, or rationale as to why such controls or provisions are not required.
- m. Proposed TS Figure 2 adds a "Pollution Control Board" to the organizational chart. Provide verification of the purpose and need for this board with regard to NRC licensed functions.
- n. Proposed TS 3.3.3 is titled "Storage Reports." Should it be Special Reports? Provide correct title.
- o. The "Bases and Safety Analysis for the Plum Brook Reactor Facility Protected Safe Storage Condition Attachment 1 to support request for amendment to License TR-3, Docket No. 50-30" ("Bases and Safety Analysis"), section 4.1 indicates that the reactor tank (RT) is purged with dry nitrogen to reduce corrosion of components. Further, section 4.2, page 4 indicates that the RT purge flow is monitored for loss of flow, that there would be no significant corrosion even after several hours of loss of purge flow, that purge flow would be reestablished within 24 hours, and that the continuing need for nitrogen purge of the RT is periodically reviewed. Since corrosion of components could significantly complicate decommissioning, provide TS requirements that ensure (1) an operable nitrogen purge system, (2) monitoring of nitrogen purge and reestablishment within 24 hours, of loss of purge (3) regular examination of associated components to ensure corrosion has not had an effect on the components and eventual decommissioning activities, or (4) justification that no such requirements are needed. Also, provide the last periodic review of the continuing need for nitrogen purge of the RT.
- p. "Bases and Safety Analysis," section 4.2, page 4 uses the term MPC. This term, which is assumed to indicate maximum permissible concentration, is not currently used in NRC regulations and should be updated to current terminology, or justification provided for the use of MPC provided.

- q. "Bases and Safety Analysis," section 5.1 indicates that the containment vessel (CV) is protected by cathodic protection that is failing, that the need for CV cathodic protection is periodically reviewed, that ultrasonic measurements of the CV wall show no change in 22 years with cathodic protection, that CV sample metal coupons in deep well ground water show corrosion rate within acceptable levels, and that cathodic protection may be terminated if there is no unreviewed safety question per 10 CFR 50.59. Provide the latest periodic review of the need for cathodic protection. Provide a description of CV sample metal coupons in deep well ground water monitoring program with corrosion rates and acceptance criteria. Since corrosion of the CV could significantly complicate decommissioning and cause an unreviewed safety question, provide TS requirements that ensure an operable cathodic protection system with allowable times for it to be out of service. If cathodic protection is not required, provide requirements for monitoring of CV wall thickness below ground and of CV sample metal coupons installed in ground water of deep wells with acceptance criteria for these measurements. Alternatively, provide justification that no such requirements are needed.
- r. "Bases and Safety Analysis," section 6.2 indicates that the weather seals on the roof hatch plugs are periodically inspected to ensure integrity. Provide TS requirement to ensure this function is performed or justification as to why it is not required to ensure that contamination is contained and controlled.
- s. "Bases and Safety Analysis," section 11.2 indicates that seals on the hot sumps and drains are periodically checked. Provide TS requirement to ensure this function is performed or justification as to why it is not required to ensure that contamination is contained and controlled.
- t. "Bases and Safety Analysis," section 18.2 indicates that as discussed in section 8, the floor hot drains lead to hot sumps which are sealed and the seals are periodically inspected. Provide TS requirement to ensure this function is performed or justification as to why it is not required to ensure that contamination is contained and controlled.

Re: National Aeronautics and Space Administration (NASA) Mock-Up Reactor (MUR) "Request for Amendment to License R-93 Docket No. 50-185 for Renewal of Possess-But-Not-Operate License" dated November 4, 1996. Note answers can refer to answers related to the PBRF responses where appropriate.

1. The cover letter indicates that the "renewal is requested due to the continued presence of the PBRF at this same site, and the lack of a dependably available nuclear low-level waste disposal facility." Provide analysis of the waste situation with supporting references and documentation to demonstrate that the proposed delay in decommissioning meets the regulation. Also, provide specifications for annually reassessing these analyses and a schedule for completion of decommissioning and final termination of the license. Alternatively, provide plans for completion of decommissioning without significant delay.
2. For the "Amendment to License No R-93, Docket No. 50-185, General Information,"
 - a. item 5, "Period of Time for which License is Sought," states "[t]wenty years from date of issuance." This term of license is also specified in other locations in the renewal request. This extended time period is more typical for operating licenses vice possession only licenses. The last period for possession only was established as ten years. Provide additional justification for the extended time period or change to an appropriate lesser time period.
 - b. item 6, "Financial Qualification," states "[b]eing an agency of the United States' Government, NASA is financially qualified to possess the requested license." With regard to financial qualification, 10 CFR 50.82(b)(3)(ii) states that "[m]eans be included for adjusting cost estimates and associated funding levels over the storage or surveillance period." Provide means to meet this requirement. Further 10 CFR 50.75(f)(3) states "[i]f necessary, the cost estimate, for power and non-power reactors, shall also include plans for adjusting levels of funds assured for decommissioning to demonstrate that a reasonable level of assurance will be provided that funds will be available when needed to cover the cost of decommissioning." Provide plans to meet this requirement.
3. For all license, Technical Specification (TS), and Safety Analysis changes, provide indication of where the changes are with side bars and provide reasons for the changes. Some specific questions on changes follow:
 - a. Item 2 of the "Proposed Amended Facility License" does not specify possession of byproduct material under 10 CFR 30 as is the case under the current license, but rather propose byproduct possession under 10 CFR 50. Provide regulatory bases for this change or propose appropriate regulations that refer to 10 CFR 30.

- b. Item 3 of the "Proposed Amended Facility License" does not indicate that 10 CFR 30.34 is contained as part of the license or that the license is subject to the conditions of 10 CFR 30.34, as is the case under the current license. Provide regulatory bases for this change or propose appropriate regulations that refer to 10 CFR 30.34.
- c. Item 3 of the "Proposed Amended Facility License" added an item (C) that fuel will not be possessed without prior approval of the Commission. This item (C) is not specified in the current license. Considering that the MUR license no longer authorizes possession of fuel under 10 CFR 70, provide bases for this item or delete. If item (C) is still deemed necessary, the "and" should be deleted after item (A) and put after item (B), and a semi-colon should replace the period after item (B).
- d. Item 4 of the "Proposed Amended Facility License" should match the current license except for the change in amendment number, unless there is appropriate justification. The current license says:

The Technical Specifications contained in Appendix A, as revised through Amendment No. 4, are hereby incorporated in the license. The licensee shall possess but not operate the facility in accordance with the Technical Specifications.

- e. The proposed TS 3.1.1, "Level 1 Directorate," adds a sentence that "The Directorate shall provide the resources to maintain the MUR in protected safe storage." This requirement was formally met by the "Aeropropulsion Facilities and Experiments Division." It is also noted that Figure 1 was changed to eliminate the "Aeropropulsion Facilities and Experiments Division." Provide the reason for the changes.
- f. The proposed TS 3.1.2, "Internal Audit" changed the requirement that

The audit shall be performed by NASA personnel not directly associated with the facility who have nuclear experience

to

The audit shall be performed by an audit committee.

Provide assurance that the audits will be independent and that the auditors will have adequate background to ensure that an acceptable audit is performed.

- g. Does the proposed TS 3.1.3, "Radiation Safety Officer (RSO)," have a typo in the seventh line where the word "he" should be "the?" Provide correction as appropriate.

- h. Proposed TSs 1.3.1 and 4 refer to ANSI/ANS 15.1-1982. The latest revision of this standard is 1990. Provide rationale to demonstrate that the reference is appropriate and applicable.
- i. Proposed TS Figure 1 adds a "Pollution Control Board" to the organizational chart. Provide verification of the purpose and need for this board with regard to NRC licensed functions.
- j. The proposed TS adds Figures 2 through 4. If these figures are added to the TS, no changes or variations from the configurations represented by these Figures could be made without TS change. Provide rationale for the need for these figures in the TS and verify that configuration changes are not planned, or delete the figures from the TS. Alternatively, adding the figures to the safety analysis could allow changes by NASA if the provisions of 10 CFR 50.59 are satisfied.
- k. The "Bases and Safety Analysis for the Mock-up Reactor Facility Protected Safe Storage Condition Attachment 1 to support request for amendment to License R-93, Docket No. 50-185" refers to an "Attachment 4, 'Bases and Safety Analysis for Plum Brook Reactor Protected Safe Storage Conditions, Attachment 1 to Support Request for Renewal Amendment to License TR-3, Docket No. 50-30' of letter from NASA Plum Brook Reactor Facility to U.S. Nuclear Regulatory Commission, Division of Licensing, Attn: Mr. C. O. Thomas. Subject: Request for Amendment to Operating License TR-3, Docket No. 50-30." Should this reference be to the current submittal dated November 4, 1996, on "Request for Amendment to License TR-3, Docket No. 50-30 for Renewal of Possess-But-Not-Operate License," or is there other appropriate reference? Provide the correct reference.
- l. The "Bases and Safety Analysis for the Mock-up Reactor Facility Protected Safe Storage Condition Attachment 1 to support request for amendment to License R-93, Docket No. 50-185" provides a description of the facility. Item 1 of the "Proposed Amended Facility License" states that "[t]he MUR is described in the application dated March 15, 1961, and amendments thereto including the amendments dated March 26, 1973, and supplement dated May 18, 1973, to the NASA license application." Should the list of amendments also include the current amendment? Ensure that the safety analyses and facility descriptions are consistent. Provide a list of the exact documents and references that specify the design basis for the facility, and if any of these have not been previously provided to the NRC transmit them to the NRC with your response to this question.