

National Aeronautics and
Space Administration
Lewis Research Center
Plum Brook Station
6100 Columbus Avenue
Sandusky, Ohio 44870



Reply to Attn of

7030

FEB 14 1997

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Report of Reactor Status for the NASA Plum Brook Reactor
(License No. TR-3, Docket 50-30) and the NASA Plum Brook
Mock-Up Reactor (License No. R-93, Docket 50-185)

Enclosed is the Annual Status Report dated January 1997, for the Plum Brook Reactor (License TR-3) and the Plum Brook Mock-Up Reactor (License R-93). This report is for the reporting period January 1, 1996, through December 31, 1996. Submission of this annual report is in compliance with Section 3.31 of the current TR-3 and R-93 possess-but-not-operate licenses which became effective January 28, 1987, and January 12, 1987, respectively.

Subject reactors continue to be maintained in a protected safe storage condition.

A handwritten signature in cursive script, reading "Henry G. Pfanner".

Henry G. Pfanner
Engineer, Plum Brook Reactor Facility

Enclosure

Approval:

A0201

A handwritten signature in cursive script, reading "Joseph A. Yuska".

Joseph A. Yuska
Director, Engineering and Technical Services

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cc:

U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement, Region III
Attn: Mr. Kenneth R. Ridgeway, Inspector
Reactor Operations Nuclear Support Branch
Program Support Section
801 Warrenville Road
Lisle, IL 60532-4351

U.S. Nuclear Regulatory Commission
Attn: Mr. Marvin Mendonca, Senior Project Manager
Non-Power Reactors and Decommissioning Project Directorate
Washington, DC 20555

ANNUAL STATUS REPORT

Reporting Period: January 1, 1996 - December 31, 1996

NASA, Plum Brook Reactor
License No. TR-3
Docket No. 50-30

NASA, Plum Brook Mock-Up Reactor
License No. R-93
Docket No. 50-185

USNRC Dismantling Order
Dated May 26, 1981

NASA Application to USNRC,
Dated July 26, 1985,
Requesting Return to
"Possess-But-Not-Operate" Status

NASA, Plum Brook Reactor
License No. TR-3
Amendment #8
November 30, 1989

NASA, Plum Brook Mock-Up Reactor
License No. R-93
Amendment #4
October 12, 1989

January 1997

NASA Lewis Research Center
Plum Brook Station
6100 Columbus Avenue
Sandusky, Ohio 44870

TABLE OF CONTENTS

1. Introduction
2. Status of Reactor Facility
3. Organization
4. Condition of Systems and Components
5. Security and Surveillance Measures
6. Facility Changes
7. Facility and Environmental Radiological Surveys
8. Maintenance Performed
9. Audits and Inspections
10. Unusual Occurrences
11. License Status
12. Other

ANNUAL STATUS REPORT
FOR THE
NASA PLUM BROOK REACTOR AND PLUM BROOK MOCK-UP REACTOR

1. Introduction:

The following Annual Status Report for the period January 1, 1996, through December 31, 1996, has been prepared pursuant to Section 3.3.1 of the Plum Brook Reactor Facility (PBRF) TR-3 License effective January 28, 1987, and Mock-Up Reactor R-93 License effective January 12, 1987. Both of the above-mentioned reactors are licensed as "possess-but-not-operate."

2. Status of Reactor Facility:

At the time NASA requested a Dismantling Order, funding for the reactor dismantling project was anticipated, and an active dismantling effort was planned and scheduled. However, because of continuing federal budget restrictions, NASA has continued to find it necessary to defer funding for this project. As a result, no major dismantling activities have been performed to date, nor are any planned.

Since 1982, NASA has continued to remove various uncontaminated tools, spare parts, and experimental hardware not required for maintaining protected safe storage or supporting future dismantling efforts. This is being done to make such items available to NASA and other Government agencies.

In its letter to NASA dated August 16, 1984, the USNRC directed NASA to either request reinstatement of the "possess-but-not-operate" status for the two Plum Brook Reactors or submit a revised dismantling plan and schedule. NASA responded in a letter dated October 29, 1984, stating that it intended to formally request return to the "possess-but-not-operate" licensing status. On July 26, 1985, NASA submitted applications and supporting documents to the USNRC for the "possess-but-not-operate" status. The PBRF TR-3 License was issued January 28, 1987, and the MUR R-93 License was issued January 12, 1987. Both licenses are in effect for ten (10) years.

In addition to providing adequate resources and funding for past, present and future protected safe storage of the reactors, NASA funded an engineering study in 1984 to document the existing conditions at the site. The study was initiated near the end of CY84, and major field work began in early 1985. The purpose of the study was to gather data on the current condition of the

facilities and equipment at the site, and to reinventory the radioactive contamination at the end of the twelve-year radiological decay period since Reactor shutdown in January 1973.

3. Organization:

The NASA Lewis Research Center (LeRC) completed an organizational realignment in October of 1996. As a result, the Plum Brook Management Office (PBMO) now reports to the Engineering and Technical Services Directorate instead of the Aeronautics Directorate. This change is reflected in the Generic Organization Chart supplied as part of both the PBRF TR-3 and MUR R-93 license renewal applications submitted to the NRC on November 4, 1996.

During the reporting period, Mr. Henry G. Pfanner continued to serve as the Plum Brook Reactor Facility (PBRF) Engineer, responsible for maintaining the protected safe storage mode of the reactors. The daily security, surveillance, and maintenance activities continued to be performed by an on-site support service contractor, Gilcrest Electric & Supply Company.

Mr. Keith Peecook continues to serve as the first alternate PBRF Engineer. Ms. Gayle Reid remains as the Radiation Safety Officer for the PBRF and also serves as an alternate PBRF Engineer.

Mr. Robert P. Kozar continued to serve as Chief of the Plum Brook Management Office (PBMO). The PBMO is responsible for the Level 2 Management of the PBRF. Mr. Keith Peecook remains as chairman of the PBRF Safety Committee; there were two safety committee meetings conducted during 1996.

4. Condition of Systems and Components:

The condition of all systems and components vital to maintaining safe protected storage has been carefully reviewed. All systems are performing satisfactorily.

As reported in previous years, the Containment Vessel (CV) Cathodic Protection System remains energized, but is providing less than the recommended level of cathodic protection for portions of the CV wall. Ultrasonic testing at four inspection ports in 1996 showed no measurable change in CV wall thickness from the original material specifications. The ultrasonic testing continues on an annual basis. In addition, NASA has established annual visual inspections and corrosion rate assessment checks

using sample coupons. No significant corrosion has been observed during the first eleven years of data evaluation.

5. Security and Surveillance Measures:

Security inspections are conducted at the PBRF twice daily, and each of the major buildings is inspected by a security guard once each day. In addition, other security checks, such as inspection of fences and locks, are conducted monthly. Surveillance of operating systems and components, absolute filters, and radiological surveys are performed as specified in the PBRF Procedures Manual. Surveillance inspections are performed for some non-operating systems and components to assure that the protected safe storage conditions are maintained.

All of the security and surveillance inspections are accomplished by use of Inspection and Test Report (ITR) check sheets to insure they are promptly and properly completed. Completed ITRs are reviewed and approved by the PBRF Engineer and/or alternate and filed in the PBRF Vital Records. ITRs indicating that corrective action is required are a responsibility of the PBRF Engineer and the PBMO.

Equipment Maintenance Records (EMRs) are utilized to document maintenance on vital components, equipment, systems and facilities which are not otherwise covered under the routine ITR system (See Section 8).

Personnel access to areas of the reactor site with significant known or suspected levels of radiation is controlled under a Safe Work Permit (SWP) system.

The security and surveillance program in effect at the PBRF appears to be adequate to maintain the facilities in a protected safe storage mode.

A total of three SWPs were issued during 1996, and all personnel exposures were well within permissible limits of 10 CFR 20. A statistical breakdown of the exposure levels as per 10 CFR 20.407 is given below.

<u>Estimated Whole Body Exposure Range (REMs)</u>	<u>Number of Individuals in Each Range</u>
No Measurable Exposure	1
Measurable Exposure Less than .1	4
.1 to .25	0
.25 and Above	0

6. Facility Changes

A Facility Change (FC) System is utilized to provide documentation and approval of changes to existing facilities and structures, new structures, a physical change to equipment or system, or any change which alters a defined PBRF End-Condition statement.

There were no FCs initiated during 1996. In addition, all previous FCs had been completed before the beginning of this reporting period.

7. Facility and Environmental Radiological Surveys:

The 1996 monitoring data continued to include direct radiation, surface contamination, airborne and waterborne activity and stream silt. These parameters did not vary significantly from data obtained during the previous 23 years of standby or protected safe storage of the PBRF. All data indicates the radioactivity within PBRF is being safely contained.

8. Maintenance Performed:

All maintenance performed during the reporting period fell under the Equipment Maintenance Record (EMR) System.

The work covered under the EMR System involved routine maintenance and other minor repairs made to equipment within the Reactor complex. This work was normally performed by the on-site support service contractor who conducted the normal day-to-day maintenance and surveillance at the PBRF.

There were a total of 16 maintenance tasks completed in 1996 under the EMR system described.

9. Audits and Inspections:

Mr. Kerry Remp continues to serve as chairman of the PBRF Audit Team. Mr. Robert Corban and Mr. David Robinson also continued to serve on the audit team.

The annual audit of the PBRF was conducted on December 5, 1996, by the PBRF Audit Team. No items of non-compliance were noted during this audit.

There was no on-site NRC audit of the PBRF during 1996.

10. Unusual Occurrences:

There were no unusual occurrences at the PBRF during 1996 which were reportable to USNRC under the criteria of 10 CFR 21.3, 10 CFR 21.4 and 10 CFR 50.72.

11. License Status:

The effective date of the PBRF TR-3 license is January 28, 1987, and the effective date of the MUR R-93 License is January 12, 1987. Both licenses are effective for ten years from the date of issuance.

Renewal applications for the current Plum Brook Reactor (License TR-3) and Plum Brook Mock-Up Reactor (R-93 License) were prepared and submitted to the NRC for approval on November 4, 1996. The NRC reviewed the license renewal applications and returned a list of items to NASA requesting clarification and/or additional information. NASA prepared responses for this list of items and submitted them to the NRC on December 20, 1996.

12. Other:

A maintenance project for the PBRF is being planned. The scope of this project will include long term maintenance items such as roof repairs, exterior painting, upgrading the electrical power system along with replacement of monitoring equipment and communication cabling. This project will also include inspections of normally sealed areas for structural integrity and water infiltration. The estimated cost of this project is \$950,000 and completion is scheduled for 1997.

Disposal of Excess Plum Brook Station Property - GSA continues to investigate the possible transfer of 604 acres in the western area of Plum Brook Station to other government agencies. If this transfer occurs, the Station fence line will be modified to conform to the new Station perimeter. The nearest point of property affected is approximately 5,000 feet from the fenced site of the PBRF. NASA will continue to control access to the total Station, as well as inspect, maintain and provide security surveillance for the existing or revised Plum Brook Station perimeter fence line. Conditions at the PBRF will be unaffected.