

National Aeronautics and
Space Administration
John H. Glenn Research Center
Lewis Field
Plum Brook Station
Sandusky, OH 44870



Reply to Attn of:

7030

MAR 10 2000

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)

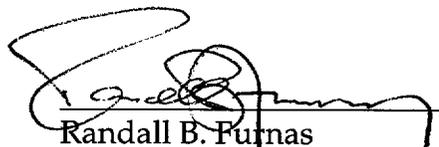
Enclosed is the Annual Status Report, dated January 2000, for the Plum Brook Reactor (License TR-3) and the Plum Brook Mock-Up Reactor (License R-93). This report is for the reporting period January 1, 1999, through December 31, 1999. Submission of this annual report is in compliance with Section 3.31 of the current TR-3 and R-93 possess-but-not-operate licenses which became effective May 19, 1998.

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


Henry G. Pfanner
Engineer, Plum Brook Reactor Facility

Enclosure

Approved:


Randall B. Furnas
Director, Engineering and Technical Services

A020

cc:

U.S. Nuclear Regulator Commission
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7030/H. G. Pfanner, PBRF Vital Records

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ANNUAL STATUS REPORT

Reporting Period: January 1, 1999 - December 31, 1999

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

NASA, Plum Brook Reactor
License No. TR-3
Amendment #9
May 19, 1998

NASA, Plum Brook Mock-Up Reactor
License No. R-93
Amendment #5
May 19, 1998

NASA, Plum Brook Reactor
License No. TR-3
Amendment #10
November 16, 1999

NASA, Plum Brook Mock-Up Reactor
License No. R-93
Amendment #6
June 23, 1999

January 2000

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

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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, 1999, through December 31, 1999, has been prepared pursuant to Section 3.3.1 of the Plum Brook Reactor Facility (PBRF) TR-3 and the Mock-Up Reactor (MUR) R-93 Licenses both effective May 19, 1998. 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 in 1980, funding for the reactor dismantling project was anticipated, and an active dismantling effort was planned and scheduled. However, because of federal budget restrictions, NASA found it necessary to defer funding for this project. As a result, no major dismantling activities have been performed to date.

In its letter to NASA dated August 16, 1984, the NRC 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 Nuclear Regulatory Commission (NRC) for the "possess-but-not-operate" status. The PBRF (TR-3) License was issued January 28, 1987, and the MUR (TR-93) License was issued January 12, 1987. Both licenses were in effect for ten years.

Renewal applications for the PBRF License (TR-3) and the MUR License (R-93) were submitted to the NRC on November 4, 1996. The NRC issued renewals for both of these licenses, PBRF (TR-3) and the MUR (R-93) on May 19, 1998. Both of these Licenses were amended during 1999 to allow for the name change from NASA Lewis Research Center to NASA Glenn Research Center. These licenses are in effect until NRC License termination following decommissioning.

During 1998, NASA renewed its intention to seek the necessary funding for decommissioning of the Plum Brook Reactor Site and to complete decommissioning in an expeditious manner. In support of this effort, NASA completed a Decommissioning Plan for the PBRF and submitted it to the NRC on

December 12, 1999. Current plans call for all decommissioning activities to be completed by the end of CY 2007.

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 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 CY 84, and major fieldwork 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 re-inventory the radioactive contamination at the end of the twelve-year radiological decay period since Reactor shutdown in January 1973.

NASA completed a review and update of this existing engineering study during 1998 in preparation for eventual decommissioning of the PBRF.

3. Organization:

The Plum Brook Management Office (PBMO) reports to the Engineering and Technical Services Directorate of the NASA Glenn Research Center. This organization is in accordance with the Generic Organization Chart in the current (TR-3) and (R-93) licenses.

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

Mr. Keith Peacock 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 continues 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 Peacock remains as chairman of the PBRF Safety Committee; there were two safety committee meetings conducted during 1999.

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.

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 ITR's are reviewed and approved by the PBRF Engineer and/or alternate and filed in the PBRF Vital Records. ITR's indicating that corrective action be taken is the responsibility of the PBRF Engineer.

Equipment Maintenance Records (EMR's) 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.

A total of six SWP's were issued during 1999, 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 follows:

<u>Estimated Whole Body Exposure Range (REM's)</u>	<u>Number of Individuals in Each Range</u>
No Measurable Exposure	6
Measurable Exposure Less than 0.1	0
0.1 to 0.25	0
0.25 and Above	0

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

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 that alters a defined PBRF End-Condition statement. There were no new FC's initiated during 1999.

7. **Facility and Environmental Radiological Surveys:**

The 1999 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 26 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 1999 under the EMR System described.

9. **Audits and Inspections:**

Mr. Robert Corban continues to serve as chairman of the PBRF Audit Team. Mr. Timothy Gaydos and Mr. Gerald Carek remain as Audit Team members.

There was one audit of the PBRF conducted during CY99 on December 16, 1999, and no items of non-compliance were identified during the course of this audit.

There was no on-site Routine Safety Inspection of the PBRF during CY99.

10. Unusual Occurrences:

There were no unusual occurrences at the PBRF during 1999 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 both the PBRF (TR-3) and the MUR (R-93) licenses is May 19, 1998. Both licenses are in effect until license termination by the NRC following decommissioning. Amendment #10 to the PBRF (TR-3) License was approved November 19, 1999. Amendment #6 to the Plum Brook Mock-Up Reactor was approved on June 23, 1999. Both of these amendments pertain to the recent name change of NASA Lewis Research Center to NASA Glenn Research Center. This name change was directed by the U.S. Congress during March 1999.

The license stipulates that NASA is to provide a decommissioning plan to the NRC by the end of CY99, and to complete decommissioning by the end of CY07.

12. Decommissioning

Decommissioning Management

In April of 1999, NASA appointed Mr. Timothy J. Polich as NASA Glenn Research Center's Decommissioning Project Manager for the Plum Brook Reactor Facility. He is responsible for the preparation and submission of the PBRF Reactors Decommissioning Plan and will be responsible for the execution of decommissioning efforts until the PBRF licenses are terminated. Mr. Polich reports to Mr. Vernon Wessel, Director of the Office of Safety, Environmental and Mission Assurance at NASA Glenn Research Center.

Mr. Polich holds a bachelor's and a master's degree in Nuclear Engineering from the University of Illinois. Mr. Polich has 15 years of experience working for the Nuclear Regulatory Commission (NRC) including working as a Resident Inspector at several Nuclear Power Plants with his most recent experience being a Licensing Project Manager at NRC headquarters. He also has six years experience as a Navy Reactor Operator and Engineering Watch Supervisor aboard submarines.

Decommissioning Plan

NASA submitted a Decommissioning Plan to the NRC on December 20, 1999. The plan was provided in accordance with 10CFR 50.82(b) and the guidance of NUREG 1537, and outlines the NASA process for the decommissioning and license termination of the PBRF.

Community Relations

NASA held an "open house" at Plum Brook Station on October 30, 1999, to inform the public and the media about its plans to decommission the PBRF. The "open house" included a drive-by of the PBRF reactor complex and several displays providing information regarding the PBRF and the decommissioning process. A Media Day was also held to inform press about the decommissioning process. In addition, a Community Information Session was held at a local College on November 3, 1999, to further disseminate information to the public. A Community Work Group consisting of local citizens was also established. The Community Work Group met initially on November 3, 1999, and will continue to meet periodically throughout the decommissioning process to maintain an open exchange of information between NASA and the local communities.

13. Other:

Nitrogen Purge

As reported in 1998, a reduction in the purge flow of dry nitrogen gas (GN₂) through the PBRF Tank was observed. The flow reduction was caused by an obstruction in the vent line, which was subsequently cleared. The GN₂ purge is currently operating normally. The flow instrumentation was updated as part of the vent line maintenance. The purge flow continues to be monitored weekly as part of the ITR System.

Alternatives Study

NASA performed a study during 1998 to update its knowledge base regarding final disposition of the Plum Brook reactors. The study included a review of the radiological data obtained during the 1985 Engineering Study, field verification of a representative sample of the 1985 radiological data, a review and update of NRC license termination criteria changes since 1985, and updated cost estimates for various decommissioning alternatives. Additional site characterization samples were taken during 1999 to provide a more thorough database to be used for Decommissioning planning purposes.

Land Excessing

The General Services Administration (GSA) continues to investigate the possible transfer of 604 acres of excessed property 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.