National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Plum Brook Station
Sandusky, OH 44870

Reply to Attn of: 7030

MAR 0 6 2002

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 2002, 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, 2001, through December 31, 2001. 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 of Engineering and Technical Services

A020

cc:
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PBOSG/D. Young
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ANNUAL STATUS REPORT

Reporting Period: **January 1, 2001 - December 31, 2001**

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 2002

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, 2001, through December 31, 2001, 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.

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, (GRC). 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, Plum Brook Operations Support Group (PBOSG). The day to day personnel performing the PBRF tasks and the level of services provided has not changed.

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 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 Peecook remains as chairman of the PBRF Safety Committee; there were two PBRF safety committee meetings conducted during 2001

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 a security guard inspects each of the major buildings 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 35 SWP's were issued during 2001, 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:

Estimated Whole Body Exposure Range (REM's)	*Number of Individuals in Each Range
No Measurable Exposure	90
Measurable Exposure Less than 0.1	11
0.1 to 0.25	1
0.25 and above	0

* These numbers include all employees having access and assignments in the PBRF including Pre Decommissioning activities.

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 2001.

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

The CY 2001 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 28 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. The on-site support service contractor who conducted the normal day-to-day maintenance and surveillance at the PBRF normally performed this work.

There were a total of 12 maintenance tasks completed in 2001 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 conducted of PBRF activities for the CY 2001 by the GRC PBRF Audit Team. This audit was conducted on January 16, 2002 and there were no items of non-compliance.

There was no on-site, NRC Routine, Announced Safety Inspection, of the PBRF during 2001.

10. **Unusual Occurrences:**

There were no unusual occurrences at the PBRF during 2001 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. The U.S. Congress directed this name change 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 CY 2007. In support of this, NASA completed a Decommissioning Plan for the PBRF and submitted it to the NRC on December 12, 1999

On November 20, 2001, NASA forwarded license amendment requests to the NRC for both the PBRF (TR-3) license and the MUR (R-93) licenses. Specifically, these amendments request the transition of Level 2 licensee management responsibilities from the Plum Brook Management Office to the NASA Decommissioning Project Manager. In support of this transition and consistent with the pending PBRF Decommissioning Plan, several proposed changes were included. These proposed changes were to insure safety and management

oversight during the increased activities from the safe-protected- mode to the pre-decommissioning and decommissioning mode.

12. Decommissioning

Decommissioning Management

During 2001, NASA continued to increase staffing for the planning and preparation for the NASA Glenn Research Center's Decommissioning Project. There are now 15 full-time personnel working on the NASA and NASA contractor staff for the Plum Brook Reactor Facility. The Decommissioning Project Manager is Mr. Timothy Polich, who continues to be responsible for the PBRF Reactor Decommissioning Plan currently undergoing NRC review. Mr. Polich remains in the Office of Safety and Assurance Technologies (OSAT) at NASA Glenn Research Center. He reports to the Program Manager, Mr. Frank Greco at Glenn Research Center, who in turn reports to Mr. Vernon Wessel, Director of OSAT.

The other NASA positions added in 2001 were an Environmental Engineer, Mr. Peter Kolb and a Budget Analyst, Mr. Robert Bayda. The NASA Construction Manager retired and was replaced with a contractor.

NASA Contractor positions added, upgraded, or replaced in 2001 include Environmental Technician Ms. Karen Hite (Plum Brook Operations Support Group (PBOSG)); Project Safety and Health Officer, Mr. Henry Bayes (Argonne National Laboratory (ANL)); Project Radiation Safety Officer, Mr. Kurt Geber (ANL); Licensing Engineer, Mr. Bryan Moyers (ANL); Construction Manager, Mr. Charles Fellhauer (ANL); Senior Health Physicist, Mr. William Renner (PBOSG); and Junior Health Physicist, Ms. Rebecca Johannsen (PBOSG).

Decommissioning Plan

NASA responded to requests for additional information (RAI) from the NRC regarding the Decommissioning Plan. The initial response was submitted on March 28, 2001, with followup submittals on November 20, 2001 and December 20, 2001. NASA also submitted a License Amendment on November 20, 2001 to change the on-site license responsibility from the Engineering and Technical Services Directorate to the Office of Safety and Assurance Technologies.

Community Relations

NASA held the third annual Community Information Session at a local High School on October 23, 2001, to further disseminate information to the public. The Community Work Group that consists of local citizens continues to have regular quarterly meetings. These Work Group Meetings were held in January, April, July, and October of 2001.

Decommissioning Contractor

NASA has continued its "Federal Sector Team" approach with Department of Energy - Argonne National Lab (ANL) and the US Army Corps of Engineers (USACE). As stated above ANL is directly contracted to NASA to help provide technical oversite of the decommissioning. USACE is NASA's 'prime contractor' for decommissioning. USACE has in turn contracted with Montgomery Watson Harza (MWH) as their Total Environmental Restoration Contract (TERC). Duke Engineering and Services (DES), and MOTA Corporation are subcontractors to MWH. The number of USACE and contractor on-site personnel at the end of 2001 was as follows: USACE – 4, MWH – 8, DES – 5, MOTA – 9.

13. **Other:**

Pre-Decommissioning Activities

Efforts were made to prepare the PBRF site for decommissioning. Additional characterization work was done, scaffolding was installed to make access easier into some of the 25' deep quadrants and canals, facility cranes were restored to service, and an office and work trailer complex was put in place at the reactor. The main accomplishment during the year was the successful removal, packaging, and shipping of loose metal equipment from the seven hot cells. Six B-25 containers were shipped on August 8, 2001 to Alaron in Wampum, Pennsylvania, for processing.

Cost Estimate

NASA contractor USACE completed a Baseline Schedule and Cost Estimate for the PBRF Decommissioning Project in July 2001. NASA reviewed the estimate internally and obtained a third party to independently review the estimate.

Loose Equipment Removal

Plans were prepared to conduct additional removal of loose equipment from the facility. This effort focused on the equipment in the quadrants that surround the

reactor tank, the canal inside the Containment Vessel, and on the ground level inside the CV. Samples were taken to support Part 61 characterization of the equipment. Packaging will occur once the material has been properly characterized.

Additional Characterization

Other characterization efforts were also conducted. An entry was made through the shielding plugs into the Hot Dry Storage area. A video was taken to help confirm the inventory of the equipment in storage there, as well as to document its physical condition. Direct radiation readings were taken, and swipe samples collected. An activation analysis for the reactor core internals, the vessel, and some of the equipment in Hot Dry Storage was initiated. Additional contamination sampling was also conducted in various areas around the Reactor Building and the Reactor Office and Lab Building.