

August 22, 2006

Dr. Woodrow Whitlow, Jr, Director  
NASA Glenn Research Center at Lewis Field  
21000 Brookpark Road M.S. 3-2  
Cleveland, Ohio 44135

SUBJECT: NRC INSPECTION REPORT NO.50-30/2006-202 AND NO.50-185/2006-202

Dear Dr. Whitlow:

This refers to the inspection conducted on April 24 - 28, 2006, at your Plum Brook Reactor Facility. The inspection included NRC participation in the second public meeting to review the radiological contamination in off-site areas of the Plum Brook. The enclosed report presents the results of the inspection.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations of activities in progress. Based on the results of this inspection, no safety concerns or noncompliance with NRC requirements were identified. No response to this letter is required.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/reading-rm/adams.html>.

Should you have any questions concerning this inspection, please contact Mr. Patrick Isaac at 301-415-1019.

Sincerely,

/RA/

Johnny Eads, Branch Chief  
Research and Test Reactor Branch B  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Docket Nos. 50-30 and 50-185  
License Nos. TR-3 and R-93  
Enclosure: NRC Inspection Report Nos. 50-30/2006-202 and 50-185/2006-202  
cc w/enclosure: See next page

National Aeronautics and  
Space Administration

Docket Nos. 50-30/185

cc:

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Test, Research and Training  
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University of Florida  
202 Nuclear Sciences Center  
Gainesville, FL 32611

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U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION

Docket Nos: 50-30 and 50-185

License Nos: TR-3 and R-93

Report Nos: 50-30/2006-202 and 50-185/2006-202

Licensee: National Aeronautics and Space Administration

Facility: Plum Brook Reactor Facility  
Test Reactor and Mockup Reactor

Location: Sandusky, Ohio

Dates: April 24 - 28, 2006

Inspector: Thomas F. Dragoun

Approved by: Johnny Eads, Branch Chief  
Research and Test Reactors Branch B  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY  
NASA Plum Brook Reactor Facility  
Report Nos: 50-30/2006-202 and 50-185/2006-202

The focus of this inspection was the status of the radiological surveys of Plum Brook and Pentolite Ditch creek beds, revision of procedures and policies to replace those taken during the demobilization and departure of USACE and MWH, ORISE inspection results, and a Community Workgroup Meeting.

Site Organization Restructuring

- The change in authority and responsibilities giving NASA complete control and oversight of decommissioning activities has been effectively implemented.

Procedures

- The inspector determined that the policies and procedures are reviewed and issued as required by the regulations. Adherence to the procedures was satisfactory.

Plum Brook Contamination

- The inspector determined that the licensee's program for surveys of Plum Brook in off-site areas was appropriate for the level and location of the contamination.

## REPORT DETAILS

### Summary of Plant Status

NASA and NASA support personnel from ANL have assumed direct control of all site activities with MOTA Corporation as prime contractor. Cleaning and radiation surveys of contaminated embedded and buried pipe was making satisfactory progress. Development of NASA procedures and policies to replace those used by USACE and MWH was a top priority. The NASA staff provided a comprehensive status of the site activities during the regular Community Workgroup Meeting that was open to the public. An inspector from the Ohio Department of Health accompanied the NRC inspector during portions of the site visit.

### 1. Site Organization

#### a. Inspection Scope (IP 69013)

The inspector reviewed the qualifications of the NASA site staff to determine if the DPlan Section 2.4 requirements continued to be met. The review included:

- organization and staffing
- training and experience of personnel
- staff turn-over
- Babcock Services, Inc (BSI) Lesson Plans:
  - BSI-PBRF-001, "Operational Checkout of 2350-1 Data Logger with Various Detectors to Support Embedded Piping Surveys IAW BSI/LVS Pipe Crawler-002, Revision 3
  - BSI-PBRF-002, "Control of Areas Being Transferred for FSS Evaluation"
  - BSI-PBRF-003, "Overview of Implementing PBRF-CS-007 & PBRF-CS-011 EP-BP"
  - BSI-PBRF-004, "Overview of the PBRF Characterization and FSS Plans"
  - BSI-PBRF-009, "Operational Checkout of 2350-1 Data Logger With LVS Electric/Pneumatic Pipecrawler to Support Piping Surveys IAW BSI/LVS Pipe Crawler-003

#### b. Observations and Findings

NASA issued Revision 5 to the Decommissioning Plan (DPlan) on December 5, 2005, after USACE and its contractors completed the demobilization and departure from the site. The changes to Dplan Section 2.4 shifted all project management responsibilities to the NASA staff including direct oversight of contractors. The transition appears to be complete and the NASA staff and all contractors were fully adjusted to this major change in responsibility.

The incumbents in the NASA supervisory positions were personnel who have been with the project for several years. Site turnover has remained normal. This was also the case with the labor contractor (MOTA) supervisors and workers. The inspector observed a few work coordination meetings and concluded that the working relations at all levels in the organizations has become positive and adjusted to the new arrangements.

Cleaning and surveying of embedded pipe was being done by a contractor (Babcock Services, Inc.) and was one of the major work activities on-site. The contractor utilized unique pipe crawlers with on-board radiation sensors that were calibrated using NIST traceable radiation sources on flexible strips of tape. The inspector toured the BSI training area and discussed the use of a mock-up of the specialized equipment to train the technicians who will do the survey. The training material and equipment were detailed and technical information was thorough.

c. Conclusions

The change in authority and responsibilities giving NASA complete control and oversight of decommissioning activities has been effectively implemented.

**2. Policies and Procedures**

a. Inspection Scope (IP 69013)

The inspector reviewed selected procedures to ensure that the requirements of TS Section 6.10 "Procedures" and 10 CFR 20.1101 "Radiation Protection Programs", were implemented and incorporated in the following:

- NASA PBRF Decommissioning Project Procedure "Survey Methodology to Support PBRF License Termination" Document Number: CS-01 Revision 0
- Survey Request dated April 3, 2006, for a characterization survey of the Plum Brook Stream Bed, Section E of phase 2, extending from the junction with Route 250 to the junction with Route 2. The inspector discussed the survey requirements with the 3 person survey team (2 health physics technicians and 1 data logger) in the field
- Procedure PBRF-WEP-05-006, "Decontamination and Radiological Survey of Embedded and Buried Piping Systems" Revision 2, effective March 30, 2006. A job safety analysis dated November 23, 2005 was attached to the procedure
- Decommissioning Plan for the Plum Brook Reactor Facility Revision 5, dated December 5, 2005
- Procedure PBRF RP-60 "Radiological Laboratory Quality Assurance/Quality Control Program" Revision 0, effective February 2, 2006
- Procedure PBRF RP-20 "Operation and Calibration of the Packard Model 2900TR Liquid Scintillation Analyzer" Revision 3
- Procedure PBRF RP-21 "Operation of the ORTEC HPGe Gamma Spectroscopy System" Revision 2, dated February 8, 2005

b. Observations and Findings

The licensee was in the final stages of generating the procedures and written policies to reflect the changes in responsibility after NASA took direct control of all site activities. Priority was given to the safety related procedures and work in

progress. A sampling of a few procedures indicated that the requirements in TS Section 6.0 for procedures were satisfied, such as review and approval by the Project Safety Committee. Observation of radiological survey teams in the field indicated that the procedures were properly implemented.

The inspector visited the on-site radiological analytical laboratory. The laboratory supervisor and technician discussed the availability and implementation of governing procedures for quality assurance and operation of counting equipment with the inspector. No deficiencies were noted.

c. Conclusions

The inspector determined that the policies and procedures were reviewed and made available as required by the regulations. Adherence to the procedures was satisfactory.

**3. Plum Brook Contamination**

a. Inspection Scope (IP 69013)

To determine the status and results of the radiation surveys of the Plum Brook creek bed, the inspector reviewed the following:

- Status and results of radiation surveys in off-site sections of Plum Brook presented in a regularly scheduled Community Workgroup public meeting held on April 25, 2006
- Observed of a survey team taking radiation readings and silt samples in off-site sections of Plum Brook. Visited some locations of elevated levels identified during scan surveys
- Quality control of laboratory analysis of silt samples by "Replicate Analysis". Calculation sheets for January, February, and March 2006
- Survey Request Form Number SR-20 for stream bed sampling dated April 3, 2006
- Memorandum from the Radiation Protection supervisor to NASA Project Decommissioning Engineer dated April 27, 2006, providing the status of thirteen Survey Packages numbers SR-10 to SR-23
- ORISE report to NRC, "Final Site-Specific Decommissioning Inspection Report No.1 for the Plum Brook Reactor Facility, Sandusky, Ohio, Revision 0 (Docket Nos. 50-30 and 50-185) dated May 3, 2006
- NASA public affairs release "Results of Off-site Sampling in Plum Brook" dated April 2006
- NASA Plum Brook Offsite Characterization Report, Sections A through D dated April 19, 2006  
NASA Procedure "Survey Methodology to Support PBRF License Termination CS-01" Revision 0, undated.
- NASA Letter to Ohio Environmental Protection Agency , "NASA Plum Brook Reactor Facility, Director's Final Findings and Orders" dated May 3, 2006
- MOTA Task Baseline Configuration for contracts NNC05TA62 tasks 6-9 (on-



site scoping and characterization surveys) and tasks 18, 24, 26, and 27 (off-site characterization of Plum Brook)

- NASA internal status briefing by telephone for management at the Glen Research Center by the PBRF Project Manager on April 25, 2006
- Procedure, "PBRF-RP60, Radiological Laboratory Quality Assurance/Quality Control Program RP-60" Revision 0, effective February 2, 2006
- Procedure, "PBRF-RP20, Operation and Calibration of the Packard Model 2900TR Liquid Scintillation Analyzer" Revision 3
- Procedure, "PBRF-RP-021, Operation of the ORTEC High Purity Germanium Gamma Spectroscopy System" Revision 2 dated February 8, 2005

b. Observations and Findings

Tours of the Plum Brook areas with elevated readings was provided by the Assistant Radiation Safety Officer. Accessibility to all areas along the run of the creek has been good. The highest elevated concentration of radioactive material in silt to date was 50 picocuries per gram of Cesium 137. The licensee concluded that the off site deposits of radioactive material did not adversely affect the health and safety of the public. The current pattern of deposits suggests that small pockets of slightly elevated readings will likely be detected in the remaining course of the Plum Brook.

At NRC request, ORISE conducted an on site review of the creek bed surveying techniques and the performance of the on-site analysis of silt. The procedures for performing the surveys and the use of radiation measuring equipment was found to be satisfactory. Some improvements were suggested and NASA management indicated that changes will be made. The performance of the laboratory was also found to be satisfactory. The inspector reviewed personnel dosimetry reports and found that exposures were well below the NRC limits.

Information regarding the status of the off-site surveys and on-site work progress provided to the public was accurate and factual.

c. Conclusions

The inspector determined that the licensee's program for surveys in off-site areas was appropriate for the level and location of the contamination.

#### **4. Exit Interview**

The inspection scope and results were summarized on April 28, 2006, with members of licensee management. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

## PARTIAL LIST OF PERSONS CONTACTED

### Licensee

F. Greco, NASA Program Manager  
K. Peecook, NASA Acting Project Manager  
P. Kolb, Environmental Monitoring Program Manager  
J. Thomas, ANL/NASA Quality Assurance Engineer  
R. Case, ANL/NASA Assistant Radiation Safety Officer  
W. Stoner, ANL/NASA Radiation Safety Officer  
J. Fuerstenberg, PBOSG Administrative Assistant

## INSPECTION PROCEDURES USED

IP 69013      RESEARCH AND TEST REACTOR DECOMMISSIONING

## ITEMS OPENED, CLOSED, AND DISCUSSED

Opened      none

Closed      none

## LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DPlan	Decommissioning Plan
IP	Inspection Procedure
MOTA	Mechanical Organization Technical Assistance
MWH	Montgomery Watson Harza
NASA	National Aeronautics and Space Administration
NRC	Nuclear Regulatory Commission
RSO	Radiation Safety Officer
SR	Survey Request
TS	Technical Specification
USACE	United States Army Corps of Engineers