

October 31, 2003

Mr. Donald J. Campbell, Director  
NASA Glenn Research Center at Lewis Field  
21000 Brookpark Road M.S. 3-2  
Cleveland, OH 44135

SUBJECT: NRC ROUTINE, ANNOUNCED INSPECTION REPORT NOS. 50-30/2003-201  
AND 50-185/2003-201

Dear Mr. Campbell:

This letter refers to the inspection conducted on September 8-12, 2003, at your Plum Brook Reactor Facility. The inspection included a review of decommissioning activities authorized for your facility. The enclosed report presents the results of that 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, one deviation was identified concerning the failure to audit the training program content. Prompt and effective action was taken by site management to correct this finding. No response to this letter is required.

In accordance with 10 CFR 2.790 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. Thomas Dragoun at 610-337-5373.

Sincerely,

**/RA/**

Patrick M. Madden, Section Chief  
Research and Test Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket Nos. 50-30 and 50-185  
License Nos. TR-3 and R-93

Enclosure: NRC Inspection Report Nos. 50-30/2003-201 and 50-185/2003-201

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  
Reactor Newsletter  
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: 50-30/2003-201 and 50-185/2003-201

Licensee: National Aeronautics and Space Administration

Facility: Plum Brook Reactor Facility  
Test Reactor and Mockup Reactor

Location: Sandusky, OH

Dates: September 8-12, 2003

Inspector: Thomas F. Dragoun

Approved by: Patrick M. Madden, Section Chief  
Research and Test Reactors Section  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY  
NASA Plum Brook Reactor Facility  
Report Nos: 50-30/2003-201 and 50-185/2003-201

The focus of this inspection was the on-site review of selected aspects of the decommissioning program including organization and staffing, worker training, and transportation of radioactive waste.

Organization and Staffing

- A reorganization of the project has occurred. The changes, made to improve productivity and radiological safety, were in conformance with the Decommissioning Plan and the requirements of the Technical Specifications.

Worker Training

- The routine training program was consistent with the Decommissioning Plan and the requirements in 10 CFR 19.12.

Transportation of Radioactive Waste

- The radwaste program satisfied the regulatory requirements and licensee commitments. Record keeping required improvement.

## REPORT DETAILS

### **Summary of Plant Status**

On March 20, 2002, the NRC approved the licensee's Decommissioning Plan (DP), Revision 1, dated March 2001, as amended. This authorized the decontamination and remediation of systems and components in the Plum Brook reactor facilities to allow termination of the NRC licenses. Revision 2 dated October 2001 was currently in effect. Activities in progress during this inspection included removal of radioactive material from the hot cells and preparations for segmenting the highly radioactive reactor vessel internal structures for removal. The contractor that provided, among other things, the site radiation safety program, was terminated and was in the final stages of vacating the site. Key personnel changes occurred in some organizations. Shipments of radwaste were under way.

### **1. Organization and Staffing**

#### a. Inspection Scope (IP 40755)

The inspector reviewed the following to determine if the recent changes in the organization and personnel satisfied the requirements specified in the Technical Specifications (TS) Section 6.0 and the DP Section 2.4:

- staff responsibilities
- review of qualifications
- administrative controls and oversight
- NASA Plum Brook Reactor Facility Site Specific Safety and Health Plan, Revision 0, undated
- Procedure RP-100, "Radiological Protection Plan for the Decontamination and Decommissioning of the Plum Brook Reactor Facility", Revision 1, dated May 16, 2002

#### b. Observations and Findings

Licensee management stated that a stop work order was issued to the US Army Corps of Engineers (USACE) and Montgomery Watson Harza (MWH), the prime contractor, due to concerns about the lack of decommissioning progress. Work was allowed to resume subject to implementation of programmatic improvement. Changes instituted to resolve the root causes of this problem included revising the prime contract to reflect a performance-based arrangement with six month award periods and streamlining the on-site organization structure. In addition, personnel changes and reassignment of MWH management personnel to new work groups was implemented. The sub-tier contractor providing the radiation safety program (Framatome) was terminated and the program responsibility was assigned directly to MWH as the prime contractor. The final stages of the implementation of these changes was occurring during this inspection. The inspector determined that the organizational changes were in conformance with the DP and TS. Mechanical Organization Technical Assistance (MOTA) Corporation remains as the labor contractor.

The inspector interviewed several NASA and MWH managers, supervisors, foremen, technicians, and workers with jobs related to radiological safety in regards to their training and experience and understanding of their responsibilities. All personnel were equipped with the training and experience necessary to effectively perform their safety function and understood their responsibility. The inspector noted that most of the radiological engineers, technicians, foremen and workers were employed by a sub-tier contractor (Bartlett) and were not permanent Framatome employees. These personnel were unaffected by the major organization changes since MWH extended the existing contracts.

c. Conclusions

A reorganization of the project has occurred. The changes, made to improve productivity and radiological safety, were in conformance with the DP and TS requirements.

**2. Worker Training**

a. Inspection Scope (IP 40755)

The inspector reviewed the following to determine if the radworker training program satisfied the requirements in 10 CFR 19.12 and DP Section 2.5:

- MWH letter to USACE, "Internal Compliance-Based Audit of the MWHT Training Department" dated September 11, 2003
- Content of the General Employee Training modules
- Slide presentations for the radworker training program
- MWH PBRF Decommissioning Project procedure #MW-PL-02-002, "Training Plan" Revision 1, dated July 18, 2003
- NASA Plum Brook Reactor Facility Site Specific Safety and Health Plan Revision 0, undated
- Written exams associated with the training program

b. Observations and Findings

The MWH Training Manager provided all safety related instructions to all workers and staff. This included OSHA, industrial hygiene, Department of Transportation, and security awareness along with the NRC required radiation safety topics. The technical content of the radiation safety presentations and exams was good. The inspector noted that the training program was a one-person operation and may become overloaded when in-processing a large number of workers during peak activity on site. The training manager stated that some help was available for the radiation safety training.

Section 2.5 of the DP states that the Executive Safety Board will ensure that reviews or audits of the training and certification programs are conducted. An



audit was completed during this inspection and concluded that the DP requirements were satisfied.

c. Conclusions

The routine training program was consistent with the DP and the requirements in 10 CFR 19.12.

**3. Transportation of Waste**

a. Inspection Scope (IP 86740)

The inspector reviewed the following to ensure that the processing and shipping of radioactive waste (radwaste) was conducted in accordance with NRC requirements in 10 CFR Parts 20 and 71, DOT requirements in 49 CFR Parts 171 to 178, and Section 3.2 of the DP:

- Procedure PBRF-EW-001, "Handling, Accumulation and Disposal of Hazardous/Nonhazardous Waste" Rev 1, dated October 1, 2002
- Procedure PBRF-EW-002, "Handling of Mixed Waste" Rev 1, dated October 1, 2002
- Procedure PBRF-EW-003, "Packaging/Shipment of Limited Quantity Radioactive Material Samples" Rev 1, dated October 8, 2002
- Procedure PBRF-EW-004, "Packaging Radioactive Contaminated Asbestos Containing Material" Rev 1, dated October 8, 2002
- Procedure PBRF-EW-005, "Control of Containers" Rev 1, dated October 8, 2002
- Procedure PBRF-EW-006, "Packaging and Shipment of Protective Clothing" Rev 1, dated October 1, 2002
- Procedure PBRF-EW-007, "Packaging and Shipment of Limited Quantity Radioactive Materials" Rev 1, dated October 1, 2002
- Procedure PBRF-EW-009, "Packaging and Shipping of Type A Quantities of Radioactive Materials" Rev 1, dated October 1, 2002
- Procedure PBRF-EW-010, "Packaging of Radioactive Material" Rev 0, dated October 1, 2002
- Procedure PBRF-EW-011, "Reactor Component Cask Handling and Loading Procedure" Rev 0, dated August 5, 2003
- Procedure PBRF-EW-012, "Reactor Component Liner Receipt, Handling and Loading Procedure" Rev 0, dated August 1, 2003
- Procedure PBRF-EW-013, "Reactor Component Characterization and Classification" Rev 0, dated July 30, 2003
- Procedure PBRF-EW-014, "Shipment of Reactor Components to Barnwell" Rev 0, dated July 30, 2003
- Procedure PBRF-EW-015, "Shipment of Reactor Components to Envirocare of Utah" Rev 0, dated July 30, 2003
- Procedure PBRF-EW-016, "Water Management" Rev 0, dated May 21, 2003

- Procedure PBRF-EW-017, "Waste Immobilization" Rev 0, dated July 30, 2003

- Procedure PBRF-EW-019, "Reactor Component Sealand Receipt, Handling and Loading Procedure" Rev 0, dated August 5, 2003
- Shipment log labeled "Example Only"
- Training and Certification of waste handlers and supervisors
- Records package for shipments #03-RW-0001 and #03-RW-0002
- Receipt inspection of a flat bed truck
- Field interviews with waste handlers, foremen, and HP technicians

b. Observations and Findings

Procedures were available for all radwaste packaging and shipment activities. The licensee's procedures were supplemented by MWH and MOTA procedures that provided details such as checklists and instructions as needed. The results are a well documented and formalized waste management program.

A new Remediation and Waste Management section was created during the major contractor reorganization that occurred a few weeks prior to this inspection. Interviews with the personnel in this new section indicated that they were trained and certified as required by the regulations. In addition, most had many years of applicable experience.

The inspector discussed a proposed waste handling arrangement with an Envirocare representative who was on site for the negotiations. The proposal would result in Envirocare taking formal possession of certain waste on site and prior to shipment. The inspector noted that this arrangement could be beneficial to the licensee and the matter will be reviewed in a future inspection.

The inspector requested the licensee to provide the close-out packages of records for completed shipments. Indications were that approximately 15 shipments were completed. Three records packages were located initially but not the remainder. Prior to the end of this inspection, the licensee stated that the records had been found and were not initially available due to the transition and disruptions created by the termination of the contractor responsible for the records. Furthermore, a satisfactory program for processing and retaining records required by the regulations will be operational by October 3, 2003. The licensee was informed that this matter will be reviewed in a future inspection (Unresolved Item (URI) 50-30/2003-201-01).

c. Conclusions

The radwaste program satisfied the regulatory requirements and licensee commitments. Record keeping required improvement.

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

The inspection scope and results were summarized on September 12, 2003, 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, Decommissioning Project Management  
K. Peacock, NASA Senior Project Engineer  
T. Polich, NASA Decommissioning Project Manager  
R. Pell, ANL/NASA Assistant Radiation Safety Officer  
J. Thomas, ANL/NASA Quality Assurance Manager / Licensing Engineer  
K. Archer, MWH Environmental, Safety, and Health Manager  
T. Alber, MWH Characterization Supervisor  
J. Crocker, MWH Project Manager  
G. Fiscus, MWH Remediation and Waste Manager  
T. Harris, MWH Waste Supervisor  
P. Jones, MWH Characterization Engineer  
D. McEleney, MWH Characterization Technician  
B. Parish, MWH Radiation Protection Manager  
M. Schaefer, MWH Waste Engineering  
A. Smith, MWH Waste Coordinator  
G. Sperbeck, MWH Waste Supervisor  
T. Taniguchi, MWH Training Manager  
J. Wagner, MWH Characterization Engineer  
M. Fulford, USACE Site Manager  
B. Clayman, Envirocare  
J. Fuerstenberg, PBOSG Administrative Assistant

## **INSPECTION PROCEDURE USED**

IP 40755      Class III Non-Power Reactors  
IP 86740      Inspection of Transportation Activities

## **ITEMS OPENED, CLOSED, AND DISCUSSED**

Opened      50-30/2003-201-01      URI      Resolve radwaste transportation record keeping

Closed      None

## **LIST OF ACRONYMS USED**

ALARA      As Low As Reasonably Achievable  
CFR      Code of Federal Regulations  
DPlan      Decommissioning Plan  
MOTA      Mechanical Organization Technical Assistance  
MWA      Montgomery Watson Associates  
NASA      National Aeronautics and Space Administration  
NRC      Nuclear Regulatory Commission  
RSO      Radiation Safety Officer  
TS      Technical Specification  
USACE      United States Army Corps of Engineers