

October 1, 2004

Dr. Julian M. Earls, 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. 50-30/2004-201  
AND 50-185/2004-201

Dear Dr. Earls:

This refers to the inspection conducted on May 17-21, 2004, 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, 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. Thomas Dragoun at 610-337-5373.

Sincerely,

**/RA/**

Patrick M. Madden, Section Chief  
Research and Test Reactors Section  
New, Research and Test Reactors Programs  
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. 50-30/2004-201 and 50-185/2004-201

cc w/enclosure: Please see next page

National Aeronautics and  
Space Administration

Docket Nos. 50-30/185

cc:

Ohio Department of Health  
ATTN: Radiological Health Program  
Director  
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Columbus, OH 43216

Ohio Environmental Protection Agency  
Division of Planning  
Environmental Assessment Section  
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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: 50-30/2004-201 and 50-185/2004-201

Licensee: National Aeronautics and Space Administration

Facility: Plum Brook Reactor Facility  
Test Reactor and Mockup Reactor

Location: Sandusky, Ohio

Dates: May 17 - 21, 2004

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: 50-30/2004-201 and 50-185/2004-201

The focus of this inspection was the on-site review of selected aspects of the decommissioning program including organization and staffing, records retention, waste processing, and industrial safety.

Organization and Staffing

- The organization and staffing were consistent with Technical Specification and Decommissioning Plan requirements.

Records Retention

- Within the scope of this review, the inspector determined that the required records were retained but minor incompatibilities in coding by Montgomery Watson Harza and National Aeronautics and Space Administration need to be resolved.

Waste Processing

- The processing of radwaste satisfied the regulatory requirements and licensee commitments. Corrective action for an unresolved item regarding maintenance of shipping records was complete and satisfactory.

Industrial Safety

- Within the limited scope of the review, the inspector determined that the licensee and contractors have implemented the industrial safety program specified in the Decommissioning Plan.

## REPORT DETAILS

### **Summary of Plant Status**

Dismantling crews were at work removing equipment, experiment apparatus, and loose items from Hot Dry Storage (high level waste), Fan House, Pump House, and various levels of the reactor building. Waste was loaded into large steel boxes or commercial Sea-Land containers. The staff indicated that over one million pounds of waste was shipped thus far. Daily truck shipments were noted. Recordkeeping by the prime contractor has significantly improved. Retention of supervisory staff has become a management challenge.

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

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

The inspector reviewed the following to determine if the organization and the qualifications of the staff satisfied the requirements in Technical Specification (TS) Section 6.0 and the Decommissioning Plan (DPlan) Section 2.4:

- staff responsibilities
- review of qualifications
- Memorandum to Timothy J. Polich, (NASA) Decommissioning Project Manager, from John A. Thomas, NASA Project QA Manager, "Audit Report, Staff Qualifications (Technical Specification Required Audit)" dated May 26, 2004
- Report "Audit of Radiological Characterization Activities on the NASA Plum Brook Reactor Facility (PBRF) Decommissioning and Decontamination Project" dated March 9, 2004. In particular Section 1.0 Task 1
- Procedure RP-100, "Radiological Protection Plan for the Decontamination and Decommissioning of the Plumbrook Reactor Facility", Revision 1, dated May 16, 2002
- Memorandum to Chairman, Executive Safety Board, from Chairman, Plum Brook Reactor Facility Internal Audit Committee, "Annual Internal Audit of Plum Brook Reactor Facility" dated February 18, 2003

##### **b. Observations and Findings**

The major changes in the organization structure and personnel in the on-site contractor groups and United States Army Corps of Engineers office, underway during the September 2003 NRC inspection, are completed. The NASA staff was expanded by the addition of a Central File Clerk and an Assistant Radiation Safety Officer with experience in decommissioning and license termination surveys. Staff turnover has stabilized. Incumbents in positions identified in the TS satisfied the training and experience requirements. Licensee audits confirm these results.

The inspector was informed by the Montgomery Watson Harza Project Manager that six key MWH managers had declined a staff retention bonus contract and were seeking other employment. This financial incentive is commonly used in short duration projects to minimize loss of staff. During interviews with the inspector, some supervisors expressed concern regarding their unclear authority

under the unique NASA-USACE-MWH contractual arrangement (including Mechanical Organization Technical Assistance and Bartlett labor brokers). Others stated that their professional reputation and job opportunities may be damaged by affiliation with a “troubled” project. The inspector relayed this information to licensee management and stated that work should stop if the supervisory staff described in the TS and DPlan was not maintained. However, on the last day of inspection the inspector was informed that all six accepted the bonus contract.

The licensee and prime contractor indicated that no additional reorganization was planned. Management focus was now on team building and identification of the specific skills inventory to oversee specific remediation projects.

c. Conclusions

The organization and staffing were consistent with Technical Specification requirements.

2. **Records Retention**

a. Inspection Scope (IP 69013)

The inspector reviewed the following to determine if the recordkeeping program satisfied the requirements in 10 CFR 20, TS Section 6.13 and DPlan Section 3.1.2.6:

- NASA Plum Brook Reactor Facility First Quarter ALARA Report
- NASA Report “Audit Performance Report” (Criteria 17 of the 10 CFR 50 Appendix B Quality Assurance Plan), dated September 12, 2003, lead auditor R. Pell
- NASA Procedure “Document Controls and Records Management” by Administrative Systems 02, Revision 0, effective July 2, 2002. This specifies the implementation of NASA Procedure NPG 1441.1, “NASA Records Retention Schedules” which requires use of Standard Subject Identification Codes (SSIC)
- NASA Procedure “PBRF Project Filing Plan” Revision 0, dated December 13, 2002. Lists the “AFS” code - title of record, person responsible to maintain, name of originator, file location, and retention schedule for records coded in SSIC
- MWH Printout “MWH Filing System” computer file dump on May 18, 2004, requested by the inspector to demonstrate implementation of NASA AFS code and compliance with regulatory required recordkeeping
- NASA Procedure “Vital Records Index Alphabetically” revised on November 27, 2002
- Radiological Occurrence Report ROR-04-11 dated May 14, 2004
- Procedure MWHT PBRF Decommissioning Project “Document Control” PBRF-AD-002, Revision 2, dated October 10, 2003
- Procedure MWHT PBRF Decommissioning Project “Document Creation, Revision, and Cancellation” PBRF-AD-001, Revision 2, dated September 19, 2002

- Procedure MWHT PBRF Decommissioning Project “Work Execution Package Procedure” PBRF-AD-003, Revision 3, dated April 23, 2004
- Memorandum to Timothy J. Polich, (NASA) Decommissioning Project Manager, from John A. Thomas, NASA Project QA Manager, “Audit Report: Document Control - Audit Checklist No. 12” dated April 29, 2004
- Memorandum to Timothy J. Polich, (NASA) Decommissioning Project Manager, from John A. Thomas, NASA Project QA Manager, “Audit Report: Instructions, Procedures, Drawings - Audit Checklist No. 14” dated April 29, 2004

b. Observations and Findings

The prime contractor MWH accumulates, controls, reviews, and provides security (locked and fire resistant cabinets, restricted access - doors to storage area are locked) for official records. Document packages are first reviewed for completion using a checkoff sheet by the functional team manager. Completed packages accepted by the reviewer are forwarded to the MWH on-site central file. Central file clerks verify that the package was reviewed, take custody, log it in, and file the material in a locked cabinet. The inspector challenged the program by requesting the central file staff to retrieve a few particular files. This request was quickly and accurately satisfied. The inspector concluded that the MWH recordkeeping program has significantly improved.

In anticipation of the eventual transfer of records to NASA, MWH implemented the NASA AFS and SSIC system for coding records. MWH management stated that storage space on site was rapidly being filled and the physical transfer of records to NASA was becoming urgent. NASA management stated that a directive was being drafted to accomplish the transfer and that the person who will manage the files was onboard. The inspector noted that there were some differences in coding by the parties. For example, MWH uses SSIC code #1014 for “equipment maintenance records” while NASA uses the same code for “policies”. In addition, the inspector could not locate SSIC codes for radiological occurrence reports and certain other radiation safety program records. NASA management stated that all compatibility and inconsistent coding issues will be addressed in the directive that was being prepared. The inspector stated that the resolution of the recordkeeping issues will be reviewed in a future NRC inspection (Inspector Follow-up Item 50-185/2004-201-01).

c. Conclusions

Within the scope of this review, the inspector determined that the required records were retained but minor incompatibilities in coding by MWH and NASA needed to be resolved.

3. **Waste Processing**

a. Inspection Scope (IP 69013)

The inspector reviewed the following to ensure that the packaging and classification 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 DPlan:

- MWH Letter to Sheryl Leeper, USACE, from James E. Crocker, MWH Project Manager, "Subject: Surface Contaminated Object/Low Specific Activity Technical Basis Document" dated March 1, 2004
- NUREG-1608/ RAMREG-003, "Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects" dated July 1998
- Audit by NASA PBOSG, "Audit of Characterization Activities on the NASA Plum Brook Reactor Facility (PBRF) Decommissioning and Decontamination Project" by John Ross and Michael Sudsina dated March 9, 2004
- NASA Technical Basis Document Number PBRF-TBD-04-001, "Subject: LSA/SCO Determination" Revision 1, dated March 24, 2004
- MWH Letter to Sheryl Leeper, USACE, from James E. Crocker, MWH Project Manager, "Subject Shipment #04-RW-0093, 10-160B Cask and Liner #2" with attachments, dated April 15, 2004. Shipment made on March 21, 2004
- Procedure PBRF-EW-011, "Reactor Component Cask Handling and Loading Procedure" Revision 0, dated August 5, 2003
- NASA Letter to E. William Brach, NRC, from Timothy J. Polich, NASA Decommissioning Project Manager, "Re: General License, NRC-Approved Package (10 CFR 71.12)" dated August 22, 2003. NASA requests to register as a user of cask CNS 8-120B #USA/9168/B(U)
- NRC Letter to Timothy Polich, NASA, from Michelle DeBose, NRC Licensing Assistant, "User Registration" dated September 24, 2003 registering NASA as a user of cask with COC #9168
- NRC Certificate of Compliance #9168 dated October 15, 2002, for shipping cask CNS-10-160B
- NASA Letter to E. William Brach, NRC, from Timothy J. Polich, NASA Decommissioning Project Manager, "Re: General License, NRC-Approved Package (10 CFR 71.12)" dated April 1, 2004. NASA requests to register as a user of cask CNS 10-120B #USA/9204/B(U)
- NASA Letter to Document Control Desk, NRC, from Timothy J. Polich, Project Manager, "Re: Quality Assurance Program, NRC Licensed Packages (10 CFR 71.101)" dated May 27, 2004
- NRC Letter to Julian Earls, NASA, from Robert J. Lewis, NRC Transportation and Storage Safety and Inspection Section, "Quality Assurance Program Approval for Radioactive Material Packages #0926, Revision 0" dated June 10, 2004
- MWH Constructors Subcontract #LTERC -C4013-1361-OJ with Duratek, Inc. for shipping cask services dated January 22, 2004
- Plum Brook Reactor Facility Shipping Radwaste Shipping Schedule Revision 00, dated October 23, 2003
- Duratek Procedure TR-OP-046, "Handling Procedure for Transport Cask CNS 10-160B, Certificate of Compliance Number 9204" Revision 6, dated April 16, 2004
- Field tours and interviews with waste handlers, foremen, and HP technicians

b. Observations and Findings

During the previous NRC inspection, the inspector determined that the program for keeping records required by regulation was flawed and ineffective. During the current inspection, the inspector found that MWH had established an effective, well organized central file system as described in Section 2 of this report. Action on this matter is complete and satisfactory, Unresolved Item 50-30/2003-201-01 is closed.

The functional waste team was revising procedures and policies to implement the recently revised DOT regulations and simplify site practices. The staff recently completed the training on the revised DOT regulations. Full implementation of the changes was targeted to be complete by mid-June. This satisfies the DOT deadline of October 1, 2004.

The NRC office that reviews and approves users of shielded shipping casks may require licensee's to obtain approval of their quality assurance program (QA) for the equipment prior to becoming an authorized user. The NRC did not invoke this requirement for a request submitted in September 2003. However, the QA requirement was invoked for an April 2004 request for a different cask. This introduced an unanticipated delay that caused the licensee to become concerned about the ability to complete a scheduled shipment of high radiation level waste. Through use of direct communications and expedited submittals, the NRC was able to grant the required approvals in time to avoid impacting the shipping schedules.

The MWH supervisors stated that staffing of radwaste workers, health physics technicians, and support staff will increase to handle the anticipated increase in volume of low level waste, such as dirt and structural concrete, as soon as the removal of high level waste was complete. The inspector toured the radwaste staging and storage areas which were changed to allow easier and faster access by transport vehicles and loading equipment. The changes appeared to be appropriate and well planned. Packaging consisted of large, re-useable, intermodal, custom designed steel boxes that satisfy requirements in 49 CFR 173.410 and commercial Sea-Land containers. The inspector also noted that a few exclusive use truckloads of waste were shipped each day.

c. Conclusions

The processing of radwaste satisfied the regulatory requirements and licensee commitments. Corrective action for an unresolved item regarding maintenance of shipping records was complete and satisfactory.

**4. Industrial Safety**

a. Inspection Scope (IP 69013)

To verify the implementation and effectiveness of the industrial safety program required by the DPlan Section 3.2.4, inspector reviewed:

- Procedure "MWH Constructors Desktop Instructions - Safety Performance Requirements - MWH-DI-001" Revision 1, dated January 8, 2004 and

associated checklist completed by three - person safety team on April 4, 2004

- MWH Constructors "Safety Awards Program" and associated form, "Safety Award Nomination" and several completed forms on file that resulted in awards
- Procedure "MWHT PBRF Decommissioning Project - Beryllium Management Plan - MW-PL-03-009" Revision 1, dated October 10, 2003
- Department of Energy issued 10 CFR Part 850 "Chronic Beryllium Disease Prevention Program; Final Rule" published in Federal Register Vol. 64, No. 235, dated December 8, 1999
- Material Safety Data Sheet for Beryllium dated January 21, 2003
- Procedure "PBRF Surveillance and Maintenance Plan" Revision 2, dated June 4, 2003
- Meeting of safety supervisors held May 19, 2004
- Inspection report by MWH Corporate Safety Manager dated May 5, 2004
- "Weekly Inspection Form" dated December 31, 2003. No procedure reference
- Observed the "daily morning meeting" held at 7:00 o'clock on May 19 and 20 for job foremen and workers. Each day a different but interesting safety topic was presented in a creative way.

b. Observations and Findings

A complaint regarding the protection of workers exposed to beryllium hazards was resolved satisfactorily.

The inspector found that protective equipment was properly used by workers during tours of the work areas. Activities observed were performed in accordance with safe practices.

The safety staff stated that only one reportable lost time injury occurred since the project began. Based on the limited review by the inspector during this visit, the industrial safety program appeared to be fully and effectively implemented.

The MWH safety and training personnel were commended for the unique and effective presentations regarding safety issues during the daily morning meeting.

c. Conclusion

Within the limited scope of the review, the inspector determined that the licensee and contractors have implemented the industrial safety program specified in the DPlan.

## 5. Exit Interview

The inspection scope and results were summarized on May 21, 2004, 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  
P. Kolb, NASA Environmental Monitoring Program Manager  
R. Dotson, NASA GRC Radiation Safety Officer  
R. Pell, ANL/NASA Radiation Safety Officer  
J. Thomas, ANL/NASA Quality Assurance Manager / Licensing Engineer  
J. Crocker, MWH Project Manager  
G. Fiscus, MWH Remediation & Waste Manager  
M. Schaefer, MWH Waste Engineering  
A. Smith, MOTA Waste Coordinator  
G. Sperbech, MWH Waste Supervisor  
L. Powell, USACE Health Physicist  
J. Fuerstenberg, PBOSG Administrative Assistant

## INSPECTION PROCEDURES USED

IP 69013 RESEARCH AND TEST REACTOR DECOMMISSIONING

### ITEMS OPENED, CLOSED, AND DISCUSSED

Opened Inspector Follow-up Item NASA to develop records transfer policy  
50-185/2004-201-01

Closed Unresolved Item Resolve radwaste transportation recordkeeping  
50-30/2003-201-01

## LIST OF ACRONYMS USED

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