

March 31, 2004

Dr. Denise Denton, Dean
College of Engineering
University of Washington
Box 352180
Seattle, WA 98195-2180

SUBJECT: NRC INSPECTION REPORT NO. 50-139/2004-201

Dear Dr. Denton:

This letter refers to the inspection conducted on March 2-4, 2004, at the University of Washington Nuclear Reactor Facility. The inspection included a review of activities authorized under NRC license No. R-73. 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 of NRC requirements were identified. 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 Stephen Holmes at 301-415-8583.

Sincerely,

/RA by Marvin Mendonca Acting for/

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 No: 50-139
License No: R-73

Enclosure: NRC Inspection Report No. 50-139/2004-201

cc w/encl.: Please see next page

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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 No: 50-139

Report No: 50-139/2004-201

License No: R-73

Licensee: University of Washington

Facility: Nuclear Reactor Facility

Location: More Hall Annex, University of Washington
Seattle, WA

Dates: March 2-4, 2004

Inspector: Stephen W. Holmes, Reactor Inspector

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

University of Washington Nuclear Reactor Facility
Report No: 50-139/2004-201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the University of Washington Class III nuclear reactor facility safety programs including: organizational structure and staffing, review and audit functions, surveillance, maintenance, radiation safety, emergency preparedness, physical security, reporting requirements, and transportation of radioactive material since the last NRC inspection of these areas. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements. A tour of the reactor facility was also conducted.

Changes, Organization, and Staffing

- The responsibility for managing the University of Washington Nuclear Reactor facility remained with the Dean of the College of Engineering as required by Technical Specification Section III.A.
- Line responsibility for radiological safety at the facility includes the University's Radiation Safety Officer as required in Technical Specification Section III.B.
- Decommissioning of the University of Washington Nuclear Reactor facility has been funded.

Review and Audit Functions

- Technical and Safety Committee membership and conduct of their decommissioning plan review functions were in accordance with Technical Specifications and Decommissioning Plan requirements.

Surveillance and Maintenance

- The licensee's program for surveillance and verifications satisfied Technical Specifications requirements.
- Maintenance was being completed as required.

Radiation Safety Program

- Surveys were being completed and documented as required by 10 CFR Part 20.1501(a), Technical Specifications, and licensee procedures to permit evaluation of the radiation hazards that might exist.
- Postings met regulatory requirements.
- The personnel dosimetry program was acceptably implemented and doses were in conformance with licensee and 10 CFR Part 20 limits.
- Portable survey meters, radiation monitoring, and counting lab instruments were being maintained and calibrated as required.

- The Radiation Safety Program being implemented by the licensee satisfied regulatory requirements.

Emergency Preparedness

- Emergency response staffing was sufficient for the radiological hazards involved in a fire or injury involving the University of Washington Nuclear Reactor and was as required by the Environmental Health and Safety Plan.

Physical Security

- The physical protection features of the University of Washington Nuclear Reactor met Technical Specifications and Decommissioning Plan requirements.

Reporting Requirements

- There had been no abnormal occurrences at the facility that would require a report to the NRC pursuant to Technical Specifications Section III.G.1 or 2.
- Annual reports were being submitted to the NRC as required.

Inspection of Transportation Activities

- No radioactive material was transferred to or from the reactor since the last inspection.

REPORT DETAILS

Summary of Plant Status

The licensee's Argonaut reactor remains in a shutdown status with no fuel on site. The NRC granted the licensee an Order authorizing dismantling of the facility and disposition of component parts in 1995. During the inspection, the licensee continued to possess the reactor but not operate it as stipulated in the license and applicable Technical Specifications (TS).

1. Organization, Staffing and Reports

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

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of TS Sections III.A and B were being met:

- TS for the University of Washington (UW) Nuclear Reactor (NR) Facility, Amendment No. 16, dated July 28, 1994
- UWNR Decommissioning Plan (DP), revision 1, dated July 1994
- administrative controls and management responsibilities specified in TS
- organization and staffing
- requirements for safe maintenance of the UWNR
- Annual Report from the UW for 2001/2002, dated June 5, 2002
- Annual Report from the UW for 2002/2003, dated July 23, 2003

b. Observations and Findings

The licensee's organizational structure and staffing had not functionally changed since the last inspection. The Dean of the College of Engineering is responsible for managing the UWNR and has assigned functional responsibility to an Assistant to the Dean of the College of Engineering. Line responsibility for radiological safety at the facility includes the University's Radiation Safety Officer (RSO). Both satisfy TS Sections III.A and B requirements.

The licensee's Argonaut research reactor was shut down June 30, 1988, and has not been operated since that date. All reactor fuel has been shipped off site. The inspector verified that the reactor has remained in a shut down status since the last inspection. A decommissioning order was issued on May 1, 1995, contingent on funds being available to decommission. However, the licensee could not begin the decommissioning project because no funds had been allocated by the State of Washington. Recently the University has funded the decommissioning through their capital projects program.

Through a review of records and discussions with licensee personnel, the inspector determined that, although no staff members were directly assigned to the facility, an Environment Health and Safety (EH&S) health and safety supervisor was assigned responsibly for surveillance, maintenance, and safety oversight of the facility. This was determined to be acceptable because there were no ongoing activities that would require permanent staff.

c. Conclusions

The responsibility for managing the UWNR remains with the Dean of the College of Engineering and line responsibility for radiological safety at the facility includes the University's Radiation Safety Officer as required by TS Sections III.A and B. Decommissioning of the UWNR has been funded.

2. Review and Audit Functions

a. Inspection Scope (IP 40755)

The inspector reviewed the following to ensure that the requirements of TS Section III.C were being completed as required:

- TS for the UWNR Facility, Amendment No. 16, dated July 28, 1994
- UWNR DP, revision 1, dated July 1994
- Technical and Safety Committee (TSC) meeting minutes since September 2001
- TSC review and audit functions

b. Observations and Findings

As noted during the inspection conducted September 27, 2001, (refer to NRC Inspection No. 50-139/2001-201, ADAMS Accession No. ML012850475), no TSC meeting minutes had been available because the committee had not met. The reason that no meetings had been held was that without funding nothing further could be done concerning the decommissioning of the reactor and no new issues had developed that warranted a meeting. The previous inspector noted that, if funding became available for decommissioning, the TSC would need to meet to review the project and determine how to proceed.

As noted in Section 1 of this report, decommissioning of the facility was recently funded. Subsequently the TSC met to review the project and determine how to proceed with decommissioning.

The inspector reviewed the committee minutes. The members were appointed by the Dean of the College of Engineering and included the RSO as required by TS Section III.C and DP Section 2.3.2. The TSC reviewed and discussed pre-decommissioning activities, to include permitting requirements, interfacing with State, University, and other agencies, and different approaches to demolition. The status of the decommissioning consultant contract as well as the existing DP, and its expected activity time table were also reviewed by the committee.

The inspector determined that the TSC was performing its function as required by TS Section III.C and DP Section 2.3.2.

c. Conclusions

TSC membership and conduct of their DP review functions were in accordance with TS Section III.C and DP Section 2.3.2 requirements.

3. Maintenance and Surveillance

a. Inspection Scope (IPs 40755 and 69001)

To verify that the licensee was meeting the requirements of TS Section II and licensee procedures, the inspector reviewed selected aspects of:

- TS for the UWNR Facility, Amendment No. 16, dated July 28, 1994
- surveillance, calibration, and test data sheets and records since September 2001
- General Calibration Facility Procedure, undated
- Ion Chamber Procedures, Victoreen Calibration, undated
- RML3 Count Rate Meter (CPS) Calibration Procedure, undated
- Quanta Smart for TriCarb LS (liquid scintillation) analyzer Reference Manual, revision A, dated 1999
- Microsoft Access tracking database

b. Observations and Findings

(1) Maintenance

During decommissioning, general maintenance was focused on the support services and equipment and not on any reactor systems. All operations were directed on maintaining the integrity and security of the facility, performing required health physics operations, and fulfilling TS maintenance and monitoring requirements.

Based on the inspector's interviews and observations, general maintenance was performed as expected for a university research facility.

(2) Surveillance

The inspector reviewed records of all TS required surveillances and verifications performed since September 2001. All data reviewed, including surveillance inspections and verifications, showed that the periodic checks, tests, and verifications were completed in accordance with and at the intervals required by TS Section II and licensee procedures. The results also met facility procedure parameters and were in close agreement with the previous surveillance results.

c. Conclusions

The licensee's program for surveillance and verifications satisfied TS requirements. Maintenance was being completed as required.

4. Radiation Safety Program

a. Inspection Scope (IPs 40755 and 69001)

The inspector reviewed the following selected aspects of the radiation safety program (RSP) to verify compliance with 10 CFR Parts 19 and 20, TS, and licensee administrative requirements:

- TS for the UWNR Facility, Amendment No. 16, dated July 28, 1994
- EH&S Plan, dated August 2002
- UW EH&S Radiation Safety Manual (RSM), dated January 2002
- General Calibration Facility Procedure, undated
- Ion Chamber Procedures, Victoreen Calibration, undated
- Ion Chamber Procedures, Eberline Calibration, undated
- Ludlum Model 3 Calibration Procedure, undated
- Count Rate Meter Calibration Procedure, undated
- RML3 Count Rate Meter (CPS) Calibration Procedure, undated
- Quanta Smart for TriCarb LS (liquid scintillation) analyzer Reference Manual, revision A, dated 1999
- Microsoft Access tracking database
- radiation safety training since September 2001
- UWNR radiological signs and posting
- UWNR facility and equipment during tours
- UWNR contamination and area radiation surveys since September 2001
- EH&S personnel dosimetry records since September 2001
- periodic checks, quality control, and source certification documentation since September 2001
- 2000 Annual Review of the UWRSP, dated December 6, 2000
- 2001 Annual Review of the UWRSP, dated November 26, 2001
- 2002 Annual Review of the UWRSP, dated March 2003
- Annual Report from the UW for 2001/2002, dated June 5, 2002
- Annual Report from the UW for 2002/2003, dated July 23, 2003

b. Observations and Findings

(1) Radiation Safety Program

The licensee's RSP and ALARA programs were established and described in the RSM. The program contained instructions concerning organization, training, monitoring, surveys, personnel responsibilities, material use, record keeping, emergencies, radiation safety, and maintaining doses ALARA. The ALARA program provided guidance for keeping doses as low as reasonably achievable which was consistent with the guidance in 10 CFR Part 20. Although the portions of the RSM had been revised, the RSP had not appreciably changed since the last NRC inspection. The programs, as established, appeared to be acceptable.

The Institute's annual review of the RSP required by 10 CFR 20.1101 was performed by qualified individuals selected by the TSC.

Review of procedure change records and HP records confirmed that the radiation safety officer or his/her deputy exercised line responsibility for radiological safety at the UWNR as required by TS Section III.B and RSM Section 3.D.

(2) Radiation Safety Postings

During tours, the inspector observed that caution signs, postings, and controls were acceptable for the hazards involving radiation and contaminated areas and were implemented as required by RSM Section 10 and 10 CFR 20, Subpart J. Through observations of and interviews with licensee and UW staff the inspector confirmed that personnel complied with the signs, postings, and controls. No unmarked radioactive material was noted in the facility. The inspector confirmed that current copies of NRC Form-3, "Notice to Employees," were posted in the facility as required by 10 CFR Part 19.

(3) Radiation Safety Surveys

The inspector audited all annual contamination and radiation and other periodic surveys since September 2001. They were performed and documented as required by TS Section II and RSM Section 7. Results were evaluated and corrective actions taken and documented when readings/results exceeded levels set forth in RSM Section 7. The inspector's review of the survey records since September 2001 confirmed that contamination in the facility was infrequent and well below the RSM limits of 37Bq/swipe or 8.5Bq/3ea congruous swipes. The inspector determined that the survey program satisfied 10 CFR 20.1501(a) requirements.

(4) Dosimetry

The dosimetry program requirements and procedures had not changed since the last inspection. A National Voluntary Laboratory Accreditation Program-accredited vendor was used to provide dosimetry for personnel, environmental, and area monitoring. The inspector confirmed that dosimetry was being issued to staff and licensee contractors as required by 10 CFR 20.1502 and RSM Section 6. All occupational exposures were well within NRC limits specified in 10 CFR 20.1201 and RSM Section 7 guidelines of 500mRem/month and 1000mRem cumulative/quarter. Most records showed no exposure above background.

A documented program was available for limiting the dose to the embryo/fetus of a declared pregnant woman in RSM Section 6.C. The licensee did not require a respiratory protection program or planned special exposure program.

(5) Radiation Monitoring Equipment

The calibration and periodic checks of the portable survey meters, radiation monitoring, and counting lab instruments were performed by the licensee's staff, EH&S calibration facilities, or by certified contractors. The portable survey meter calibrations were tracked and controlled using a Microsoft Access database. The inspector confirmed that the licensee's calibration procedures

and frequencies satisfied TS Section II.A and 10 CFR 20.1501(b) requirements, and the American National Standards Institute N323 "Radiation Protection Instrumentation Test and Calibration" or the instrument manufacturers' recommendations. The inspector verified that the calibration and check sources were traceable to the National Institute of Standards and Technology and that the sources' geometry and energies matched those used in actual detection/analyses.

The inspector reviewed the facility calibrations performed since September 2001. The portable meters were calibrated annually and records were maintained as required. Area Radiation Monitors were being calibrated annually as required by TS Section II.A and EH&S procedures. Additionally, the calibration for the EH&S's liquid scintillation counter was performed in accordance with their manufacturer's recommendations. The inspector reviewed selected procedures and determined them to be acceptable. All instruments checked had current calibrations appropriate for the types and energies of radiation they were used to detect and/or measure.

c. Conclusions

The inspector determined that, because: 1) surveys were being completed and documented as required by 10 CFR Part 20.1501(a), TS, and licensee procedures; 2) postings met regulatory requirements; 3) the personnel dosimetry program was acceptably implemented and doses were in conformance with licensee and 10 CFR Part 20 limits; and 4) portable survey meters, radiation monitoring, and counting lab instruments were being maintained and calibrated as required, the RSP being implemented by the licensee satisfied regulatory requirements.

5. Emergency Preparedness

a. Inspection Scope (IPs 40755 and 69001)

The inspector reviewed selected aspects of the following to evaluate the UW emergency response capability:

- Environmental Health and Safety Plan (EHSP), dated August 2002
- emergency response facilities, supplies, equipment and instrumentation

b. Observations and Findings

Although a NRC approved emergency plan was not required, the EH&S office has its own safety plan while the UW has an onsite medical clinic. Fire, ambulance, and other medical services are provided by the city and county.

Training and tours of the facility were suspended after removal of the fuel from site. The licensee's plan to provide training and tours of the facility to emergency personnel prior to active decommissioning was noted. The licensee stated that the training would be commensurate with the residual radiation hazard at the UWNR.

c. Conclusions

Emergency response staffing was sufficient for the radiological hazards involved in a fire or injury involving the UWNR and was as required by the EHSP.

6. Physical Security

a. Inspection Scope (IP 81401)

The inspector reviewed selected aspects of the following to evaluate security of the UWNR facility:

- TS for the UWNR Facility, Amendment No. 16, dated July 28, 1994
- UWNR DP, revision 1, dated July 1994
- UWNR facility during tours

b. Observations and Findings

Although a NRC-approved security plan was not required, the UW Police Department maintains its own security program and provides security and control to all buildings on university property, including the UWNR facility.

Through direct observation and discussions with licensee personnel, the inspector determined that the reactor room is being maintained secure under a lock security system as required by the TS Section I.B.2 and DP Section 8. Access to the reactor room during working hours is controlled by EH&S personnel and the entrance doors to the reactor room are locked during non-working hours as required by TS Section I.B.3.

Training and tours of the facility were suspended after removal of the fuel from site. The licensee's plan to provide training and tours of the facility to security personnel prior to active decommissioning was noted. The licensee stated that the training would be commensurate with the residual radiation hazard at the UWNR.

c. Conclusions

The physical protection features of the UWNR met TS and DP requirements.

7. Reporting Requirements

a. Inspection Scope (IP 40755)

The inspector reviewed the following to ensure that the requirements of TS Section III.F and G were being met:

- abnormal occurrences
- significant changes in facility organization
- Annual Report from the UW for 2001/2002, dated June 5, 2002
- Annual Report from the UW for 2002/2003, dated July 23, 2003

b. Observations and Findings

The 2002 and 2003 annual reports summarized the information required by TS Section III.G.3.a through d. They were issued at the end of each 12-month period as required by TS Section III.G.3. The inspector verified that there had been no abnormal occurrence, as described in TS Section III.F, at the facility that would have required a report to the NRC pursuant to TS Section III.G1 or 2. No special reports were submitted.

c. Conclusions

Annual reports were being submitted to the NRC as required. No special reports were submitted pursuant to TS Section III.G.1 or 2.

8. Inspection of Transportation Activities

a. Inspection Scope (IP 86740)

The inspector reviewed selected aspects of the following to ensure that transportation requirements of 10 CFR, 49 CFR, and licensee procedures were being met:

- Annual Report from the UW for 2001/2002, dated June 5, 2002
- Annual Report from the UW for 2002/2003, dated July 23, 2003
- UW EH&S RSM, dated January 2002
- radioactive material accountability and transfer records

b. Observations and Findings

No radioactive material was transferred to or from the reactor since the last inspection. If required, material would be passed to the UW state license and then packaged and shipped by EH&S personnel under the state license.

c. Conclusions

No radioactive material was transferred from or to the reactor since the last inspection.

9. Exit Interview

The inspection scope and results were summarized on March 3, 2004, with members of licensee management. The inspector described the areas inspected and discussed the inspection findings.

No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

*S. Addison	Radiation Safety Officer, Environmental Health and Safety Office
M. Carette	Assistant to the Dean, College of Engineering
M. Howlett	Project Manager, Capital Projects Office
*B. Pankow	Health and Safety Supervisor, Environmental Health and Safety Office
C. Pike	Principal Facilities Planner, Capital & Space Planning Office
R. Wittmier	Assistant Chief, University of Washington Police Department

* attended exit interview

INSPECTION PROCEDURE USED

IP 40755	Class II Non-Power Reactors
IP 69001	Class II Non-Power Reactors
IP 81401	Plans, Procedures, and Reviews
IP 86740	Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

NONE

Closed

NONE

LIST OF ACRONYMS USED

CFR	Code of Federal Regulations
DP	Decontamination and decommissioning
EH&S	Environmental Health and Safety
IP	Inspection Procedure
NR	Nuclear Reactor
NRC	Nuclear Regulatory Commission
PDR	Public Document Room
RSM	Radiation Safety Manual
RSO	Radiation Safety Officer
RSP	Radiation Safety Program
TS	Technical Specification
TSC	Technical and Safety Committee
UW	University of Washington