

February 11, 2004

Dr. Donald Steiner, Director
Nuclear Engineering and Engineering Physics Program
Rensselaer Polytechnic Institute
Troy, NY 12180-3590

SUBJECT: NRC INSPECTION REPORT NO. 50-225/2004-201

Dear Dr. Steiner:

This letter refers to the inspection conducted on January 5-9, 2004, at the L. David Walthousen Critical Experimental Facility in Schenectady, New York. The inspection included a review of activities authorized under NRC License No. CX-22. 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, the Nuclear Regulatory Commission (NRC) has determined that a violation of NRC requirements occurred. The violation is cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the subject inspection report. The violation is of concern because it suggests a lack of compliance with the requirements stipulated in your NRC-approved Operator Requalification Plan.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. The NRC will use your response, in part, to determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

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>.

Dr. S. Steiner

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Should you have any questions concerning this inspection, please contact Stephen Holmes at 301-415-8583.

Sincerely,

/RA/

James E. Lyons, Program Director
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No. 50-225

License No. CX-22

Enclosures: 1) Notice of Violation
2) NRC Inspection Report No. 50-225/2004-201

cc w/enclosures: Please see next page

Rensselaer Polytechnic Institute
L. David Walthousen Critical Experimental Facility

Docket No. 50-225

cc:

Mayor of the City of Schenectady
Schenectady, NY 12305

Dr. Paul J. Merges, Director
Bureau of Pesticides and Radiation
NYS Department of Environmental
Conservation
50 Wolf Road, Room 498
Albany, NY 12233-7255

Mr. John P. Spath
NYS Energy Research and Development
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Corporate Plaza West
286 Washington Avenue Extension
Albany, NY 12203-6399

New York City Department of Health
Public Health Library
125 Worth Street
New York, NY 10013

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

Dr. S. Steiner

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ADAMS ACCESSION No.: ML040300805

TEMPLATE No.: NRR-106

***Please see previous concurrence**

OFFICE	RNRP:RI	RNRP:LA	RNRP:SC	RNRP:PD
NAME	*SHolmes:rdr	EHylton	PMadden	JLyons
DATE	01/30/2004	02/11/2004	02/11/2004	02/11/2004

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NOTICE OF VIOLATION

Rensselaer Polytechnic Institute
L. David Walthousen Critical Experimental Facility

Docket No. 50-225
License No. CX-22

During an NRC inspection conducted on January 5-9, 2004, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," NUREG-1600, the violation is listed below:

10 CFR 55.59(a) requires, in part that,

"Each licensee shall(1) Successfully complete a requalification program developed by the facility licensee that has been approved by the Commission. This program shall be conducted for a continuous period not to exceed 24 months in duration."

Section 2.0 of the Rensselaer Polytechnic Institute's NRC-approved Reactor Operator Requalification Program states in part that,

"Each licensee requalifying for license renewal will be given a written exam biennially."

Contrary to the above, during one operator's 2001-2003 requalification cycle, the written examination was not given as required.

This is a Severity Level IV violation (Supplement I).

Pursuant to the provisions of 10 CFR 2.201, Rensselaer Polytechnic Institute is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the responsible inspector, Washington, D.C. 20555-0001, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

Because your response will be made 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), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at (the Public Electronic Reading Room) <http://www.nrc.gov/reading-rm/adams.html>. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated at Rockville, Maryland
this 11th day of February, 2004

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

Docket No: 50-225

Report No: 50-225/2004-201

License No. CX-22

Licensee: Rensselaer Polytechnic Institute

Facility: L. David Walthousen Critical Experimental Facility

Location: Schenectady, New York

Dates: January 5-9, 2004

Inspector: Stephen W. Holmes, Reactor Inspector

Approved by: James E. Lyons, Program Director
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

Rensselaer Polytechnic Institute
L. David Walthousen Critical Experimental Facility
Report No: 50-225/2004-201

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the Rensselaer Polytechnic Institute Class II critical experimental facility safety programs including: organization and staffing, review and audit functions; plant operations; procedures; maintenance and surveillance, emergency preparedness, physical protection, radiation protection, effluent and environmental monitoring, maintenance and surveillance, training, and transportation activities. The licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements.

Organizational and Staffing

- The operations organizational structure and functions were consistent with Technical Specification Section 6.0.

Review and Audit Functions

- NSRB membership, meeting schedule, and conduct of their review functions were in accordance with Technical Specification Sections 6.1.5 and 6.2. Changes made at the facility had been reviewed and approved in accordance with the guidance of 10 CFR 50.59.

Plant Operations

- Operational activities were consistent with applicable Technical Specification and procedural requirements. Shift staffing met the minimum requirements for current operations.

Procedures

- The Reactor Critical Facility procedural control and implementation program satisfied Technical Specification 6.2 requirements.

Maintenance and Surveillance

- The licensee's program for surveillance and limiting conditions for operation confirmations satisfied Technical Specification requirements.
- The maintenance program was being carried out as required.

Radiation Protection Program

- The radiation protection program satisfied the requirements of 10 CFR Part 19.12 and 10 CFR Part 20.1101

- Surveys were performed and documented as required by 10 CFR Part 20.1501(a), Technical Specifications, and licensee procedures.
- Radiological postings satisfied 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 according to Technical Specifications, industry/equipment manufacturer standards, and licensee procedures.

Effluent and Environmental Monitoring

- Effluent monitoring satisfied license and regulatory requirements and releases were within 10 CFR 20.1101(d), 10 CFR 20.2003, and 10 CFR Part 20, Appendix B limits.

Transportation of Radioactive Materials

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

Emergency Preparedness

- The emergency preparedness program was conducted and implemented in accordance with the Emergency Plan.

Physical Protection

- Security, facilities, equipment, and procedures satisfied the Physical Protection Plan requirements.

Training

- The 10 CFR Part 19 training was performed in accordance with established procedures.
- A violation of the Reactor Operator Requalification Program was identified.

REPORT DETAILS

Summary of Plant Status

During the inspection, the licensee's Rensselaer Polytechnic Institute critical experimental facility, licensed to operate at a maximum steady-state thermal power of one hundred watts (100 W), was operated several days to support experiments, education, operator training, and surveillance activities.

1. Organizational Structure, Staffing and Reports

a. Inspection Scope (Inspection Procedure [IP] 69001)

The inspector interviewed licensee staff and reviewed the following to ensure that the requirements in Technical Specifications (TS) Sections 6.1.1, 6.1.2, 6.1.3, and 6.1.4 were being met:

- TS for the RCF, Amendment No. 10, dated November 18, 1994
- RCF Reference Manual (RCFRM), Version 2.0, last updated 2000
- administrative controls and management responsibilities specified in TS
- organization and staffing for the reactor critical facility (RCF)
- staff qualifications
- selected portions of the Reactor Operations Logbooks from June 2002 through the present
- RCF 2002-2003 Annual Report, dated May 12, 2003
- RCF 2001-2002 Annual Report, dated May 10, 2002

b. Observations and Findings

The management structure consisted of a new Facility Director (FD), a new Operations Supervisor (OS) - a licensed senior reactor operator (SRO), a second SRO, and two trainees. The inspector interviewed the FD and OS, and determined that they were knowledgeable of their duties and responsibilities as required by TS Sections 6.1.1 and 6.1.2 and RCFRM Section 2.A. The inspector verified that the reactor staff, as required by TS Section 6.1.4, satisfied the training and experience recommended in ANSI Standard 15.4, "Standard for the Selection and Training of Personnel for Research Reactors." The inspector also determined that no functional changes had occurred in the operations organizational structure since last inspected May 28-31, 2002 (refer to NRC Inspection No. 50-225/2002-201, ADAMS Accession No. ML022390589). The health physics (HP) staffing had changed since the last inspection. A new radiation safety officer (RSO) had been hired to replace the former RSO. The inspector verified that the RSO was, as required by TS Section 6.1.1, organizationally independent of the operations group.

Review of records verified that management responsibilities were administered as required by TS, applicable procedures, and that transitions in the staffs were properly managed. The 2001 and 2002 annual reports summarized the required information and were issued at the frequency specified in TS Section 6.5.1. No special reports were submitted pursuant to TS Section 6.5.2.

c. Conclusions

The operations organizational structure and functions were consistent with Technical Specification Section 6.0.

2. Review, Audit, and Design Change Functions

a. Inspection Scope (IP 69001)

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of TS Sections 6.1.5 and 6.2 were being met:

- TS for the RCF, Amendment No. 10, dated November 18, 1994
- Nuclear Safety Review Board (NSRB) minutes since June 2002
- NSRB review of TS, 10 CFR 50.59, and procedure changes
- Letter from FD to NRC Detailing changes to instrumentation at the RCF, dated December 11, 2003
- 50.59 documentation for two instrument changes
- new Pre-Startup Procedures, Rev. 4.0, dated November 12, 2003
- new Pre-Startup Checklist, modified January 5, 2004
- new Reactor Secured Checklist, modified October 29, 2003
- RCF 2002-2003 Annual Report, dated May 12, 2003
- RCF 2001-2002 Annual Report, dated May 10, 2002

b. Observations and Findings

Review of the NSRB membership and meeting schedule confirmed that they met TS Sections 6.1.5.1 and 6.1.5.2 requirements for quorum and frequency. The inspector reviewed the minutes of the last three NSRB meetings and confirmed that the topics considered were as stipulated in TS Section 6.1.5.3. The NSRB, as required by TS Section 6.2, reviewed and approved new and substantively changes to existing procedures. The NSRB also reviewed license amendment requests and the facility license renewal application as required by TS Section 6.1.5.3.c. The inspector reviewed the minutes of the NSRB and determined that they provided guidance, direction, and operations oversight.

The inspector reviewed the two recent 50.59 changes made at the facility; 1) replacement of four strip chart recorders, and 2) replacement of both the linear and log power instruments. Records of these changes made in 2002 and 2003 and observations of the steps taken to implement the change showed that the design control program at the facility was being followed. The inspector noted that the design change reviews were concise but thorough and adequately addressed the requirements of 10 CFR 50.59(c)(2). They had been acceptably documented in accordance with 10 CFR 50.59 and applicable licensee requirements. The changes resulted in the replacement of four strip chart recorders with video graphic recorders, with data retention on magnetic media, and the replacement of both the linear and log power instruments with custom designed digital display picoammeters. None of the changes constituted a safety question nor required a change to the facility Technical

Specifications. The inspector confirmed that, prior to use, the new instrumentation was tested to verify accuracy and functionally and that all TS required protective functions were maintained.

Since the last safety reviews and audits were conducted by the NSRB in early 2002 the committee has been involved in the RCF relicensing, security changes, facility equipment upgrades, and staffing changes. During this time facility audits required by TS Section 6.1.5.4 were not performed. This was identified by the licensee during the last NSRB meeting, December 1, 2003. The committee minutes state that the audits would be completed by the spring 2004, meeting. This will be followed up in a subsequent inspection as an Unresolved Item¹ (URI 50-225/2004-201-01) NSRB to complete RCF audits by the spring 2004 meeting.

c. Conclusions

NSRB membership, meeting schedule, and conduct of their review functions were in accordance with TS Sections 6.1.5 and 6.2. Changes made at the facility had been reviewed and approved in accordance with the guidance of 10 CFR 50.59.

3. Plant Operations

a. Inspection Scope (IP 69001)

To verify that the licensee was operating the reactor and conducting operations in accordance with TS Sections 2.0 and 3.0 and procedural requirements, the inspector reviewed selected portions of the following:

- TS for the RCF, Amendment No. 10, dated November 18, 1994
- RCFRM, Version 2.0, updated 2000
- selected portions of the Reactor Operations Logbooks from June 2002 through the present
- selected RCF Pre-Startup Checklists from July 11, 2002 to present
- selected RCF Reactor Secured Checklists from July 11, 2002 to present
- experiment logs and records
- approved reactor experiments
- NSRB minutes
- RCFRM fuel handling procedure 4.G
- fuel handling equipment and instrumentation
- fuel handling and examination records
- observation of selected startup, operations, fuel movement, and shutdown activities on January 6 and 7, 2004.

¹ An unresolved Item is a matter about which more information is required to determine whether the issue in question is an acceptable item, a deviation, a nonconformance, or a violation.

b. Observations and Findings

(1) Reactor Operations

During the inspection the reactor was started up, operated, and shutdown to support the annual facility radiation survey. The inspector observed these evolutions, as well as a critical fuel experiment. Reactor operations were carried out following written RCFRM Section 3 and 4 procedures as required by TS Section 6.2. A review of the Reactor Operations Logs from July 11, 2002 to present indicated that operational problems and events, including reactor scrams, were identified and were reported and resolved as required before the resumption of operations under the authorization of a SRO. The inspector verified that these items, and other TS and procedure required entries, were logged in the Reactor Operations Logbook and cross-referenced with other checklists or records as required. A review of the logs and records also showed that operational conditions and parameters were consistent with license and TS Sections 2.0, 3.0, and 6.6 requirements and that operational limits had not been exceeded. Operations records confirmed that shift staffing met the minimum requirements for duty and on-call personnel as required by TS Section 6.1.3.

(2) Experiments

The inspector's review and observation of a graduate student's thesis experiment confirmed that experiments were reviewed and approved by the operations supervisor or referred to the NSRB as required by TS Section 6.3. Review of current experiment authorizations, procedures, and related reactor log book entries by the inspector, along with interviews of the subject student and observation of the experiment, confirmed that experiments were installed, performed, and removed as outlined in the approved experiment authorizations.

(3) Fuel Handling

The inspector reviewed RCFRM procedure 4.G - Fuel Handling, TS Section 5.6 requirements, fuel movement logs, inspection records, and observed a transfer of unirradiated fuel pins from the vault to an experimental setup and return.

The fuel related procedures were found to be of sufficient detail to ensure appropriate fuel handling operations. Fuel movement, inspection, log keeping, and data recording followed licensee procedures and met TS Section 6.6 requirements. Data recorded for fuel movement were acceptable and log entries clearly identified that fuel transfers were conducted under the direction of the SRO on duty as designated in the RCF operations logbook as required by TS Section 5.6 and RCFRM Section 4.G.1. Fuel movement was performed as required by TS Section 5.6 and RCFRM Section 4.G and with ALARA exposure in mind. The inspector noted that the briefing and instructions given to the reactor staff and the inspector prior to fuel movement were clear, concise, and appropriate for the operation.

c. Conclusions

Based on the procedures and records reviewed and the observations made during the inspection, the inspector determined operational activities were consistent with applicable TS and procedural requirements. Shift staffing met the minimum requirements for current operations.

4. Procedures

a. Inspection Scope (IP 69001)

To verify compliance with TS Section 6.2, the inspector reviewed selected portions of the following:

- TS for the RCF, Amendment No. 10, dated November 18, 1994
- RCFRM dated 2000, version 2.0
- new Pre-Startup Procedures, Rev. 4.0, dated November 12, 2003
- new Pre-Startup Checklist, modified January 5, 2004
- new Reactor Secured Checklist, modified October 29, 2003
- administrative controls
- records for changes and temporary changes
- procedural implementation
- logs and records

b. Observations and Findings

The inspector confirmed that written HP and operations procedures were available for those tasks and items required by TS Section 6.2. The licensee's procedures were found to be acceptable for the current facility status and staffing level. The inspector noted that the procedures specified the responsibilities of the various members of the staff as well as the NSRB.

The procedures were routinely updated as needed. Temporary changes to the procedures that did not change the original intent were made with the approval of the operations supervisor and were subsequently reviewed by the NSRB as required by TS Section 6.2. The inspector verified that the latest revisions to the Pre-Startup Procedures and the Pre-startup and Reactor Secured Checklists had been through this review and approval process as required.

During the inspector's tours of the facility, it was observed that personnel performing radiation surveys, conducting instrument checks, issuing dosimetry, and performing reactor operations were doing so in accordance with applicable procedures.

c. Conclusions

Based on the procedures and records reviewed and observations of staff during the inspection, the inspector determined that the procedural control and implementation program was acceptably maintained and satisfied TS Section 6.2 requirements.

5. Maintenance and Surveillance,

a. Inspection Scope (IP 69001)

To verify that the licensee was meeting the requirements of TS Sections 2.0, 3.0, 4.0, 6.2 and licensee procedures, the inspector reviewed selected aspects of:

- TS for the RCF, Amendment No. 10, dated November 18, 1994
- RCFRM, Version 2.0, updated 2000
- RCF Surveillance Record and Schedule, dated January 7, 2004
- selected portions of the Reactor Operations Logbooks from June 2002 through the present
- equipment maintenance records
- RCFRM surveillance and calibration procedures
- Area Radiation Monitoring System Calibration Procedure, Revision 1.0, NSRB approved May 23, 2002
- Reactor Critical Facility Continuous Air Monitor Calibration Procedure, Revision 1.0, NSRB approved May 23, 2002
- surveillance, calibration, and test data sheets and records

b. Observations and Findings

(1) Maintenance

The inspector reviewed the reactor log for maintenance items. This review showed that routine/preventive maintenance was documented with follow-up information consistent with TS Section 6.2 and licensee procedures. Maintenance activities ensured that equipment remained consistent with the Safety Analysis Report and TS requirements. Verifications and operational systems checks were performed after maintenance activities were completed to ensure system operability.

(2) Surveillance

Since the last NRC inspection conducted May 28-31, 2002, management has revised its Surveillance Record and Schedule to better track annual, biennial, and irregular interval checks, inventories, calibrations, inspections, surveillances, and Limiting Conditions for Operation (LCO) verifications. The FD stated that the Surveillance Record and Schedule will continue to be modified to enhance tracking and ensure completion of these activities as required by TS Sections 2.0, 3.0, and 4.0 and facility procedures.

The inspector reviewed records of all TS required surveillances and LCO verifications performed since June 2002. All data reviewed, including surveillance inspections and LCO verifications showed that the periodic checks, tests, and verifications were completed in accordance with and at the intervals required by TS Section 4.1 and licensee procedures. The results of these surveillances were within

prescribed TS Sections 2.0, 3.0, and 4.0 limits. 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 limiting conditions for operation confirmations satisfied TS requirements. Maintenance was being completed as required.

6. Radiation Protection

a. Inspection Scope (IP 69001)

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

- Radiation Safety Regulations and Procedures (RSRP), Part I: Ionizing Radiation, Revision 8, dated February 2002
- New York State Sanitary Code, Chapter 1, Part 16: Ionizing Radiation (SSC16), dated April 18, 2001
- Liquid Scintillation Operations Manual, Model 1900TR, No. 169-4066, Revision A, dated 1990
- Tennelec Eclipse LB 5110 (gas flow proportional counter), No. 9231577C, User Manual, dated November 1999
- GENIE 200 Spectroscopy System Operations Manual, No. 92308466, dated March 2001
- Germanium Detector Users Manual, GE-USR, dated September 1996
- Radiological Engineering Lab Manual, Lab #3, Gamma Spectroscopy using NaI(Tl) and HPGe Detectors, dated Spring 2002
- As Low As Reasonably Achievable (ALARA) reviews
- radiation protection training
- radiological signs and posting
- facility and equipment during tours
- RCF contamination and area radiation surveys, monitoring, and procedures
- RCF personnel dosimetry records
- periodic checks, quality control, and test source certification documentation

The inspector also observed the annual RCF "at power" radiation survey

b. Observations and Findings

(1) Radiation Protection Program

The licensee's RPP and ALARA programs were established and described in the RSRP and through associated HP procedures that had been reviewed and approved. The programs contained instructions concerning organization, training,

monitoring, personnel responsibilities, audits, record keeping, reports, and maintaining doses ALARA. The programs, as established, appeared to be acceptable. 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 RSRP had been revised, the RPP had not appreciably changed since the last NRC inspection.

The Institute's annual review of the RPP required by 10 CFR 20.1101 was performed by the RSRP as stipulated by SSC16 Section 5.b. The RNSC evaluated the institute's overall radiation safety program and the effectiveness of the administration of the program on an annual basis as required by RSRP Section 4.2(4). This included individual laboratory visits and audits. Evaluation results were presented in a brief written annual report to the Vice President of Human Resources.

Review of procedure change records, experiment authorizations, and HP records confirmed that the RSO reviewed and approved RPP changes, experiments, and radiation protection related events/conditions as required by TS 6.1.1 and RSRP Section 5.

(2) Radiation Protection 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 RCFRM Section 17 "Posting and Labeling Requirements" and 10 CFR 20, Subpart J. Through observations of and interviews with licensee and RCF staff the inspector confirmed that personnel complied with the signs, postings, and controls. No unmarked radioactive material was detected in the facility. The inspector confirmed that current copies of NRC Form-3 and notices to workers were posted in the facility as required by 10 CFR Part 19.

(3) Radiation Protection Surveys

The inspector audited the quarterly and other periodic contamination and radiation surveys since June 2002. They were performed and documented as required by RSRP Section 13.1 and RCFRM procedures. Results were evaluated and corrective actions taken and documented when readings/results exceeded levels set forth in SSC16 Appendix 16-A, Table 7, "Radioactive Surface Contamination Limits." The inspector's review of the survey records since April 2000 confirmed that contamination in the facility was infrequent and well below the SSC16 limits. 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 April 2000. 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 visitors as required by the RSRP. All exposures were well within NRC limits specified in 10 CFR 20.1201 and licensee action levels of 125 mRem/quarter and 500 mRem/year. Most records showed no exposure above background. The inspector confirmed that dosimetry was being issued to and used by staff and visitors as outlined in RSRP Section 8 and RCFRM Section 9, Personnel Safety and Radiation Monitoring.

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, Rensselaer calibration facilities, or by certified contractors. The inspector confirmed that the licensee's calibration procedures and frequencies satisfied TS Section 4.3, Radiation Monitoring 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, with one exception, 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 licensee stated that they would locate the source calibration certificate or have the source recalibrated. This item will be tracked as an Inspector Follow-up Item² (IFI 50-225/2004-201-01) licensee to locate the certificate for the RAM calibration source or have the source recalibrated.

The inspector reviewed the facility calibrations performed since June 2002. The portable meters were calibrated annually and records were maintained as required. Area Radiation Monitors and air monitors were being calibrated semiannually as required by TS Section 4.3. Additionally, the calibrations for the radiation safety office Tennelec 5900 low background alpha/beta counter, the liquid scintillation counter, and the multichannel analyzer were being performed in accordance with their manufactures' 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

² An Inspector Follow-up Item is a matter that requires further inspection because of a potential problem, because specific licensee or NRC action is pending, or because additional information is needed that was not available at the time of the inspection.

20 limits; and 4) Portable survey meters, radiation monitoring, and counting lab instruments were being maintained and calibrated as required, the RPP being implemented by the licensee satisfied regulatory requirements.

7. Effluent and Environmental Monitoring

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of the following to verify that the licensee was complying with the regulatory requirements concerning radioactive effluents:

- Safety Analysis Report dated June 1996
- TS for the RCF, Amendment No. 10, dated November 18, 1994
- RCFRM, Version 2.0, last updated 2000
- New York Code, Rules, and Regulations, Part 380, "Rules, and Regulations for Protection and Control of Environmental Pollution by Radioactive Materials," dated March 24, 1994
- liquid release records since June 2002
- counting and analysis programs
- RCF 2002-2003 Annual Report, dated May 12, 2003
- RCF 2001-2002 Annual Report, dated May 10, 2002
- environmental dosimetry records since June 2002

b. Observations and Findings

The inspector verified that radioactive liquid releases were infrequent and when performed they were analyzed to ensure they were below 10 CFR 20.2003 and 10 CFR Part 20, Appendix B limits. There were no liquid releases since the last NRC inspection.

The environmental monitoring program consists of direct quarterly radiation measurements at selected locations at the RCF boundary as described in Safety Analysis Report June 1996. These direct radiation measurements resulted in readings being statistically the same as background. Observation of the facility found no new potential release paths.

Estimates of the annual dose to the public from air emissions were calculated using the Environmental Protection Agency COMPLY computer program. This dose was well below the constraint limit of 10 mRem specified in 10 CFR 20.1101(d).

Gaseous discharges were not directly monitored due to the low reactor power levels. However, since the results from the COMPLY code indicated that doses were below 10 CFR 20.1101(d) limits and the environmental monitoring program results were the same as background, the inspector determined that gaseous effluents would also meet 10 CFR Part 20, Appendix B limits for this facility.

c. Conclusions

Effluent monitoring satisfied license and regulatory requirements and releases were within 10 CFR 20.1101(d), 10 CFR 20.2003, and 10 CFR Part 20, Appendix B limits.

8. Transportation of Radioactive Materials

a. Inspection Scope (IP 86740)

The inspector reviewed selected aspects of:

- radioactive materials shipping procedures
- radioactive materials transportation and transfer records since June 2002
- interviewed staff

b. Observations and Findings

No radioactive material was transferred from or to the reactor since the last inspection. If required, material would be passed to the university license and then packaged and shipped by Environmental Health and Safety personnel under the state license.

c. Conclusions

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

9. Emergency Preparedness

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of:

- RCF Emergency Plan (E-Plan), dated May 1994
- RCF Emergency Procedures, dated May 29, 1994
- RCFRM, Version 2.0, last updated 2000
- emergency response facilities, supplies, equipment and instrumentation
- RCF and Public Safety (PS) personnel training records
- offsite support agreements
- emergency drills and exercises

b. Observations and Findings

The inspector reviewed the E-Plan and confirmed that it was the same as the version most recently approved by the NRC. Although the inspector was able to verify that the E-Plan was audited annually and the procedures reviewed biennially by the licensee as required by E-Plan Section 10, formal documentation of these reviews was sparse. The FD stated that documentation of the annual and biennial reviews would be upgraded to allow positive verification of the reviews. This item will be tracked as an Inspector Follow-up Item (IFI 50-225/2004-201-02) annual and biennial E-plan review documentation to be upgraded to allow positive verification of the reviews.

Through reviews of training and drill records and interviews with RCF and PS personnel, the inspector confirmed that emergency response training had been given as required by E-Plan Section and that emergency responders were capable to respond, and

knowledgeable of the proper actions to take, in case of an emergency. Through random checks of the emergency supplies, decontamination facilities, and portable detection instrumentation, the inspector determined that they were, with one exception, being maintained and inventoried annually as required by the E-Plan Section 10 and Emergency Procedure 9.2, "Emergency Equipment." At the time of the inspection the RCF emergency signal, an outside mounted siren as described in E-Plan Section 8.2, was inoperative. The FD stated that this situation would be addressed and corrected. This item will be tracked as an Inspector Follow-up Item (IFI 50-225/2004-201-03)The inoperative RCF emergency siren to be fixed.

The inspector confirmed that notification procedures and phone numbers in use by the PS dispatch were current. Current E-Plan support agreements with off-site response organizations (i.e., County Fire and Sheriff departments, local ambulance services, and medical services) were reviewed by the inspector and found to be adequate.

Section 10 of the L. David Walthousen Critical Experimental Facility's emergency plan requires that emergency drills be held annually. The inspector verified that emergency drill had been held annually since the last inspection as required. The last drill, August 13, 2003, involved a dropped source with radiological contamination and resulted in exercising the RCF staff response abilities. Interactions with offsite agencies were through phone contact. The drill provided a practical, reasonable, and an effective test of the RCF staff. A number of response agency phone numbers or contacts were found to be incorrect and were subsequently corrected.

c. Conclusions

Based on the audit of the E-Plan and the emergency planning drill, the inspector confirmed that the licensee's emergency preparedness program was being satisfactorily implemented.

10. Physical Protection

a. Inspection Scope (IPs 81401 and 81431)

The inspector reviewed selected aspects of:

- the Physical Protection Plan, dated August 2002
- security systems, equipment and instrumentations
- implementation of the Physical Protection Plan
- PS Book No. 2, RCF, reviewed August 2003
- Schenectady Police Order IO-96-8, dated August 1996
- security audits

b. Observations and Findings

The Physical Protection Plan (PPP) dated August 2002, was the same as the latest submitted to the NRC in the licensee's relicensing package. The inspector toured the facility and confirmed that the physical protection systems (barriers and alarms),

equipment, and instrumentation were as required by the PPP. Access and key control was implemented in accordance with licensee implementing procedures and as required by the plan. The inspector also confirmed that the security checks, tests, verifications, and periodic audits were performed and tracked as required by the PPP. Corrective actions were taken when required.

The inspector interviewed the Director of PS, a dispatcher, and an officer who does security checks of reactor facility. All were knowledgeable of their response responsibilities.

Since the last inspection, PS instituted corrective actions to ensure that all alarm system components were checked during each inspection interval as required by the PPP. The inspector evaluated the corrective actions and reviewed all security alarm system component checks performed since the last inspection. The inspector determined that PS's corrective actions were acceptable and effective as all security checks were performed as required by the PPP. Inspector Follow-up item 50-225/2002-201-01 for failure fully performed verifications of RCF security systems is closed.

c. Conclusions

Based on the observations, the inspector found that the physical protection features, equipment, and procedures of the RCF facility satisfied the PPP requirements.

11. Training

a. Inspection Scope (IP 69001)

The inspector reviewed selected aspects of:

- RSRP Revision 8, dated February 2002
- RCFRM, Version 2.0, last updated 2000
- radiation protection training records and rosters
- radiation protection training procedures
- Reactor Operator Requalification Program (RORP), dated April 1987
- operator licenses
- operator training records
- operator physical examination records
- operator examination records
- operator active duty status

b. Observations and Findings

(1) Radiation Protection

The inspector's reviews of RCF staff's HP training records since the last inspection confirmed that 10 CFR Part 19, RSRP Section 16 "Radiation Protection Training," and specific training appropriate to individuals' status and work requirements had been provided to staff and visitors. The inspector confirmed by interviewing and

observing the staff performing reactor operations, experiments, and surveys, that the training had been effective. Additionally, the inspector verified the initial training of the new FD. All training records reviewed were current.

(2) Operator Requalification

The inspector reviewed the RORP and performed a review of operator requalification records.

The requalification record check sheet showed that all currently licensed SROs had successfully completed their emergency procedure and abnormal events training, the reactivity manipulations, and were participating in the ongoing training as required by the RORP. The inspector reviewed training records and confirmed that licensed operators attended lectures or performed self study on the appropriate subject material as required by the program and that, with one exception, competence evaluations, annual operator performance exams, and biennial comprehensive requalification exams had been given as required by the RORP. The inspector confirmed that: 1) past test questions covered the subject matter specified by the program and demonstrated technical depth; 2) required quarterly operation hours for SROs were being recorded; 3) training was provided to the reactor operators on maintenance operations and 10 CFR 50.59 design changes and evaluations; and 4) medical exams meeting 10 CFR 55.33(a)(1) requirements were performed.

In reviewing the requalification records the inspector found that one operator had not been administered a biennial comprehensive written exam as required by the RORP. This is a level IV violation (VIO 50-225/2004-201-01)

The inspector noted that the FD immediately restricted the individual to performing reactor operations only under the direct supervision of the OS until a comprehensive written exam was administered as required by the RORP.

c. Conclusions

The 10 CFR Part 19 training was performed in accordance with established procedures. A violation of the RORP was identified.

12. Follow-up on Previously Identified Issues

a. Inspection Scope

The inspector followed up on one violation and one IFI and one URI as identified and documented in Inspection Report 50-225/2002-201. The inspector reviewed these issues with the licensee to determine what actions, if any, had been taken.

b. Observations and Findings

- 1) VIO 50-225/2002-201-01 - Failure to hold annual emergency drills.

The licensee responded to the violation by letter dated February 12, 2002. The licensee stated that the Surveillance Record and Schedule would be modified to ensure actions required by the TS, NRC-approved plans, and licensee procedures would be performed as required. The licensee also instituted a sign-off by the FD and OS for each requirement.

The inspector reviewed the licensee's corrective actions and determined that they were acceptable and effective since, as noted in Section 9 above, the annual 2003 drill was held as required. Violation 50-225/2002-201-01, for failure to hold annual emergency drills is closed.

- 2) URI 50-225/2002-201-01 - Unable to locate signed NRC-396 forms certifying operator medical examinations.

During the last inspection the inspector identified that, although all licensed operators had received annual medical exams, they were not identified as meeting the requirements of 10 CFR 55.33(a)(1) as required by 10 CFR 55.21. The licensee contacted the physicians to obtain clarification if they met the requirements. Since the exams were not done with the 10 CFR 55.33(a)(1) in mind, the physicians were not able to certify the physical satisfied the requirements specified. This URI is resolved as a Level IV violation (VIO 50-225/2004-201-02) for failure to provide required biennial medical exams. Unresolved item 50-225/2002-201-01 is closed.

- 3) VIO 50-225/2004-201-02 - Failure to provide required biennial medical exams

When informed that the physicians could not certify the physicals, the licensee directly contracted for and had appropriate exams given to the operators. Additionally, the licensee modified the requalification checklist to ensure future exams would meet 10 CFR 55.33(a)(1) requirements. The inspector verified that all operators had received the scheduled medical exams and that the checklist had been modified to adequately track the required biennial medical exams.

The inspector concluded that the licensee's immediate corrective actions were comprehensive and acceptable to provide the NRC assurance that this oversight will not recur. This item is closed.

c. Conclusion

Two VIO and one URI as identified during this and the previous inspection were reviewed and were closed during this inspection.

13. Exit Meeting Summary

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on January 8, 2004. The licensee acknowledged the findings presented by the inspector during the inspection.

Discussed

NONE

PARTIAL LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
E-Plan	Emergency Plan
FD	Facility Director
HP	Health Physics
IFI	Inspector Follow-up Item
LCO	Limiting Conditions for Operations
NRC	Nuclear Regulatory Commission
NSRB	Nuclear Safety Review Board
OS	Operations Supervisor
PPP	Physical Protection Plan
PS	Public Safety
RCF	Reactor Critical Facility
RCFRM	Reactor Critical Facility Reference Manual
RORP	Reactor Operator Requalification Program
RPP	Radiation Protection Program
RSO	Radiation Safety Officer
RSRP	Radiation Safety Regulations and Procedures
SRO	Senior Reactor Operator
TS	Technical Specifications
URI	Unresolved Item
VIO	Violation