

September 12, 2002

Dr. Wade J. Richards  
6335 Price Avenue, Bldg. 258  
McClellan Air Force Base  
Sacramento, CA 95652-2504

SUBJECT: NRC INSPECTION REPORT NO. 50-607/2002-201

Dear Dr. Richards:

This refers to the inspection conducted on August 14 - 16, 2002, at the University of California, Davis Nuclear Radiation Center. The inspection included a review of 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 noncompliances 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 Mr. Thomas Dragoun at 610-337-5373.

Sincerely,

*/RA/*

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

Docket No. 50-607  
License No. R-130

Enclosure: NRC Inspection Report No. 50-607/2002-202  
cc w/enclosure: See next page



University of California - Davis/McClellan MNRC

Docket No. 50-607

cc:

Dr. Barry Klein, Vice Chancellor  
Office of the Chancellor  
University of California, Davis  
One Shields Avenue  
Davis, CA 95616-8558

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: 50-607

Report No: 50-607/2002-201

Licensee: University of California, Davis

Facility: McClellan Nuclear Radiation Center

Location: McClellan Air Force Base  
Sacramento, California

Dates: August 14 - 16, 2002

Inspector: Thomas F. Dragoun

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

## EXECUTIVE SUMMARY

University of California, Davis  
Report No: 50-607/2002-201

The primary focus of this routine, announced inspection was the on-site review of selected aspects of the licensee's Class 1 research reactor operations programs including: organization and staffing; limiting conditions of operation, operator requalification, and emergency preparedness.

### Organization and Staffing

- The licensee's organization and staffing remain in compliance with the requirements specified in the Technical Specification Section 6. Management was hiring additional personnel to resolve an under staffing situation.

### Limiting Conditions of Operation

- The reactor was operated within the limits specified in Technical Specification Sections 2.0 and 3.0. The conduct of surveillance and calibration programs satisfied the requirements in Technical Specification Section 4.0.

### Operator Requalification

- Operator requalification was conducted in accordance with 10 CFR 55 requirements.

### Emergency Preparedness

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

## REPORT DETAILS

### **Summary of Plant Status**

The licensee's two megawatt custom designed TRIGA research reactor is operated 16 hours per day, 5 days per week, in support of neutron radiography, medical isotope production, neutron tomography, experimental sample irradiation, and reactor operator training.

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

##### **a. Inspection Scope (Inspection Procedure [IP] 39745)**

The inspector reviewed the following regarding the licensee's organization and staffing to ensure that the requirements of Technical Specification (TS) Section 6.1, Amendment 11, dated December 10, 1999, were being met:

- organizational structure
- management responsibilities
- staffing requirements for safe operation of the research reactor facility
- Letter from A. G. Johnson, Chairperson, UCD/MNRC Nuclear Safety Committee, to W. J. Richards, Director, UCD/MNRC, dated July 15, 2002, "Results of the 2002 Annual Nuclear Safety Committee Audit of the UCD/MNRC".

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

The University of California, Davis /McClellan Nuclear Radiation Center (UCD/MNRC) Director and his two assistants are licensee personnel. The remaining staff, including the Health Physics Supervisor and the Reactor Operations Supervisor, were contractor personnel (Science Applications International Corporation (SAIC)). A roster of 21 personnel were available to support the two shift reactor operations schedule. Of these, 11 were licensed reactor operators and some of these operators were assigned to perform radiography and other duties due to the facility's commercial workload.

The structure of the organization and reporting relationships were as required by Technical Specification (TS) figure 6.1

Interviews with the staff indicated that most worked significant amounts of paid and unpaid overtime. The additional work efforts included obtaining formal radiographer certification, qualifying the facility for International Standards Organization (ISO) 9000 accreditation, and resolving problems with the iodine-125 production loop.

The inspector was informed that the staffing issue was identified during a July 2002 Nuclear Safety Committee (NSC) annual audit. The Director stated that, in response to the NSC recommendations, he authorized the hiring of 4 additional personnel. These extra personnel were expected to be added to the

staff over the next 3 to 6 months. In addition, the entire staff was restricted to working no more than 56 hours per week and two weekends per month.

c. Conclusions

The licensee's organization and staffing remain in compliance with the requirements specified in the TS Section 6. Management was hiring additional personnel to resolve an under staffing situation.

**2. Reactor Surveillance and Limiting Conditions of Operation**

a. Inspection Scope (IP 61745)

The inspector reviewed the following to ensure that the reactor was operated with the Limiting Safety System Setting as specified in TS 2.2.1, within the limiting conditions of operation specified in TS Section 3.0, and periodic surveillances on safety systems were performed as stipulated in TS Section 4.0:

- UCD/MNRC Operating Instructions, Chapter 3, revision 11, "3.0 UCD/MNRC Reactor Startup", undated.
- Reactor Start Up Checklist, revision 11, dated January 16, 2002. Data for August 01,10,11,12,13,and 15, 2002.
- Operations and Maintenance Manual(OMM) Procedure PM 5330, revision 0, dated February 1991.
- Computer database records for the conduct of TS 4.2.3 sections (a) through (l), "Reactor Scrams and Interlocks", completed in accordance with the appropriate procedure. Records for January 2002 to date.
- Hard copy records for the conduct of TS 4.2.2 sections (a) through (e), "Reactor Instrumentation", completed in accordance with the appropriate procedure. Records for year 2000 to date for the annual requirements, records for the past month for the remainder.

b. Observations and Findings

Two scrams occurred during this inspection due to a faulty shield door switch. One of the reactor start ups was observed by the inspector. The start up was conducted safely and in accordance with the procedure.

The inspector noted that the TS Limiting Condition for Operation 3.1.1 "Steady State Operation" and sections (d) through (g) and (j) through (l) of 3.2.3 "Reactor Scrams and Interlocks" were checked twice during the reactor start up. The first check was done automatically by the computerized control console and the second check was done manually by the reactor operator. This is a good practice.

Records indicated that periodic surveillance and calibration of safety systems were done on schedule and in accordance with the approved procedure. Data demonstrated that the equipment performed satisfactorily.

c. Conclusions

The reactor was operated within the limits specified in TS Sections 2.0 and 3.0. The conduct of surveillance and calibration programs satisfied the requirements in TS Section 4.0.

**3. Operator Requalification**

a. Inspection Scope (IP 69003)

The inspector reviewed the following to verify compliance with the requirements in 10 CFR Part 55:

- content of training classes and attendance records for: (all dated January 2000)
  - Nuclear Theory Learning Objectives
  - Atomic Nature of Matter
  - Nuclear Fission
  - Neutron Life Cycle
  - Reactivity Summary
  - Reactor Kinetics
- content of practical (walkabout) system training, including:
  - Primary Coolant System - OMM 5110, revision 5, dated July 1999
  - Control Rod Drives, dated July 1999
- monthly reactor reactivity manipulation records for all operators for the period August 2000 to August 2002
- the personal file for one operator including training session attendance, medical evaluation, and written exam results
- records of on-console time for each operator as recorded by the console computer

b. Observation and Findings

One of the Senior Operators was designated as the coordinator responsible for implementing the requalification program. This included scheduling training in procedure revisions, technical lectures, medical evaluations, written exams, and maintaining attendance records. Content of the technical lectures and written exams were appropriate. A monthly report of the requalification status of each reactor operator was provided to management by the program coordinator. The records reviewed by the inspector indicated that the operators were current.

c. Conclusion

Operator requalification was well controlled and conducted in accordance with 10 CFR 55 requirements.

#### **4. Emergency Preparedness**

a. Inspection Scope (IP 82745)

The inspector reviewed the following to verify that emergency preparedness was maintained:

- UCD/MNRC Emergency Plan, revision 6, dated Jan 2001
- Critique of an emergency drill conducted on October 10, 2001
- Letters of agreement with off site agencies including the Sacramento County Sheriff, UC Davis Medical Center, and the Sacramento Metro Fire District
- content of emergency kit No. 3

b. Observations and Findings

The Health Physics Supervisor maintains the Emergency Plan in addition to his health physics program responsibilities. This includes the planning and conduct of emergency preparedness drills.

All letters of agreement for off site support were in effect. The loss of services provided by the McClelland Air Force Base were replaced by other agencies in anticipation of the base closure on July 13, 2001.

The critique of the recent emergency drill did not identify any program weakness.

The contents of emergency response kit No. 3 was satisfactory .

c. Conclusions

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

#### **5. Exit Interview**

The inspection scope and results were summarized on August 16, 2002, 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**

J. Ching	Health Physics Supervisor
H. Egbert	Maintenance Coordinator/RO
C. Heidel	Reactor Operations Supervisor
K. Kiger	Assistant Reactor Operations Supervisor
W. Richards	Reactor Director
A. Heidel	Training Coordinator/SRO

## **INSPECTION PROCEDURE USED**

IP 39745	Class I Non-Power Reactors Organization and Operations and Maintenance Activities
IP 61745	Class I Non-Power Reactor Surveillance
IP 69003	Class I Non-Power Reactor Operator Licenses, Requalification, and Medical Activities
IP 82745	Class I Non-Power Reactor Emergency Preparedness

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

### **Opened**

none

### **Closed**

none

### **Discussed**

none

## **PARTIAL LIST OF ACRONYMS USED**

LCO	Limiting Conditions for Operations
NSC	Nuclear Safety Committee
NRC	Nuclear Regulatory Commission
SRO	Senior Reactor Operator
TS	Technical Specifications
UCD	University of California, Davis