

December 23, 2013

Dr. Barry Klein, Reactor Director
University of California, Davis
One Shields Avenue
Davis, CA 95616-8558

SUBJECT: UNIVERSITY OF CALIFORNIA, DAVIS/MCCLELLAN NUCLEAR RADIATION
CENTER - NRC INSPECTION REPORT NO. 50-607/2013-203

Dear Dr. Klein:

From December 2–5, 2013, the U.S. Nuclear Regulatory Commission (NRC or the Commission) completed an inspection at the University of California, Davis/McClellan Nuclear Radiation Center (Inspection Report No. 50-607/2013-203). The enclosed report documents the inspection results, which were discussed on December 5, 2013, with Mr. Walter Steingass, Reactor Supervisor, and Dr. Wesley Frey, Radiation Safety Officer.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspector reviewed selected procedures and records, observed activities, and interviewed personnel. Based on the results of this inspection, no findings of significance were identified. No response to this letter is required.

In accordance with Title 10 of the *Code of Federal Regulations*, Section 2.390, "Public inspections, exemptions, and requests for withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (Agencywide Documents Access and Management System (ADAMS)). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Dr. B. Klein

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Should you have any questions concerning this inspection, please contact Craig Bassett at (301) 466-4495 or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA/

Gregory T. Bowman, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Docket No.: 50-607

License No.: R-130

Enclosure:

NRC Inspection Report No. 50-607/2013-203

cc: Please see next page

University of California-Davis/McClellan MNRC

Docket No. 50-607

cc:

Dr. Wesley Frey, Radiation Safety Officer
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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: 50-607/2013-203

Licensee: University of California, Davis

Facility: McClellan Nuclear Radiation Center

Location: McClellan Park
Sacramento, California

Dates: December 2–5, 2013

Inspector: Craig Bassett

Accompanied by: Gregory T. Bowman

Approved by: Gregory T. Bowman, Chief
Research and Test Reactors Oversight Branch
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

EXECUTIVE SUMMARY

University of California, Davis
McClellan Nuclear Radiation Center
Report No: 50-607/2013-203

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the University of California, Davis (the licensee's) two Megawatt Class I research reactor safety program, including: (1) organization and staffing, (2) review and audit and design change functions, (3) reactor operations, (4) operator requalification, (5) maintenance and surveillance, (6) fuel handling, (7) experiments, (8) procedures and procedural control, and (9) emergency preparedness since the last U.S. Nuclear Regulatory Commission (NRC) inspection of these areas. The licensee's program was acceptably directed toward the protection of public health and safety and in compliance with NRC requirements. No violations or deviations were identified.

Organization and Staffing

- The organizational structure and staffing were generally consistent with Technical Specification requirements.

Review and Audit and Design Change Functions

- The Nuclear Safety Committee was meeting semiannually, reviewing the topics outlined in the Technical Specifications, and conducting annual audits of facility programs as required.
- The review, evaluation, and documentation of changes to the facility satisfied NRC requirements.

Reactor Operations

- Reactor operations were conducted in accordance with procedures and the appropriate logs were being maintained.

Operator Requalification

- Operator requalification was conducted as required by the Requalification Program and the program was being maintained up-to-date.
- Medical examinations were being completed for each operator biennially as required.

Maintenance and Surveillance

- The Preventive Maintenance Program was being used to effectively accomplish the various maintenance and required surveillance activities at the facility.

Fuel Handling

- Fuel movements and inspections were conducted in accordance with Technical Specification and procedural requirements.

Experiments

- The licensee's program for reviewing and conducting experiments satisfied procedural and Technical Specification requirements.

Procedures

- The procedure review, revision, control, and implementation program satisfied Technical Specification requirements.

Emergency Preparedness

- The emergency preparedness program was conducted in accordance with the Emergency Plan.
- Emergency response equipment was being maintained and alarms were being tested as required.
- The Memoranda of Understanding between the County of Sacramento and McClellan Park and between the facility and the University of California, Davis Medical Center were being maintained.
- Emergency drills were being conducted annually as required by the Emergency Plan.
- Emergency preparedness training for senior reactor operator personnel was being completed through the Requalification Program.

REPORT DETAILS

Summary of Plant Status

The University of California, Davis's (the licensee's) two Megawatt Class I TRIGA Mark-II research reactor continued to be operated in support of neutron radiography, medical isotope production, neutron tomography, and sample/product irradiation. During the inspection the reactor was shut down for a planned annual maintenance period.

1. Organization and Staffing

a. Inspection Scope (Inspection Procedure (IP) 69006)

The inspector reviewed the following regarding the University of California, Davis/McClellan Nuclear Radiation Center (UCD/MNRC) organization, staffing, and staff responsibilities to ensure that the requirements of Technical Specification (TS) Section 6.1 were being met:

- Management responsibilities
- Qualifications of facility personnel
- Current UCD/MNRC organizational structure
- Staffing requirements for safe operation of the research reactor facility
- Facility Procedure UCD/MNRC-0004-DOC-13, "Technical Specifications for the University of California, Davis/McClellan Nuclear Radiation Center (UCD/MNRC)," Rev. 13, approval dated March 28, 2003
- 2011 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the U.S. Nuclear Regulatory Commission (NRC) on June 25, 2012
- 2012 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 7, 2013
- American Nuclear Society Standard 15.4-1988, "Selection and Training of Personnel for Research Reactor," approved June 9, 1988

b. Observations and Findings

The subject of facility staffing was reviewed by the inspector. It was noted that the reactor operations staff consisted of four licensed senior reactor operators (SROs). The inspector also noted that one SRO had retired in July, but the licensee was maintaining his license in an active status in case his services were needed, and that another SRO was scheduled to retire at the end of 2013. Five individuals were in training to become licensed operators. The inspector concluded that staffing appeared to be adequate given the current level of operation at the facility.

c. Conclusion

The licensee's organization and staffing were in compliance with the requirements specified in TS Section 6.

2. Review and Audit and Design Change Functions

a. Inspection Scope (IP 69007)

To verify that the required reviews and audits were being completed by the licensee and to ensure that facility changes were reviewed and approved as required by TS Section 6.2, the inspector reviewed selected aspects of:

- Annual Audits conducted for 2011 and 2012
- Nuclear Safety Committee (NSC) meeting minutes for December 2011 through the present
- UCD/MNRC Facility Modification Notebook containing Facility Modification Log Forms
- Selected Facility Modification Installation Authorization Forms and the associated Facility Modification Checklist Forms processed during 2011 through 2013
- Facility Procedure UCD/MNRC-0043-DOC, "Facility Modification Procedure," Rev. 4, approval dated January 8, 2008
- Facility Procedure UCD/MNRC-0045-DOC, "Quality Assurance Program for McClellan Nuclear Radiation Center (MNRC)," Rev. 1, approval dated November 22, 1999
- 2011 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 25, 2012
- 2012 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 7, 2013
- "Charter of the Nuclear Safety Committee (NSC) for the University of California, Davis/McClellan Nuclear Radiation Center (UCD/MNRC)," Rev. 3, approval by the UCD Vice Chancellor for Research dated July 2, 2010

b. Observations and Findings

(1) Review and Audit Functions

Composition of the NSC and qualifications of NSC members were as specified in TS 6.2.1. Minutes of NSC meetings demonstrated that the committee met semiannually as required by TS 6.2.2 and provided the reviews and oversight specified in TS 6.2.3. Through records review the inspector determined that safety reviews were conducted by the NSC or a designated representative. Topics of those reviews were as required by the TS and provided sufficient guidance, direction, and oversight to ensure acceptable use of the reactor.

The inspector noted that the annual audit for 2011 was adequate and that the audit covered the activities specified in TS 6.2.4, including various aspects of the reactor facility operations and programs. It was noted that the audit had been completed by the Chair of the NSC on December 9, 2011. The 2012 facility audit had also been conducted by the Chair of the NSC, but was not completed until May 3, 2013. The audit also appeared to be adequate. No recommendations had been made in the 2012 audit.

(2) Design Change Functions

To satisfy the regulatory requirements stipulated in Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.59, "Changes, tests, and experiments," the licensee had implemented Facility Procedure UCD/MNRC-0043-DOC, "Facility Modification Procedure." The procedure was developed to address activities that affected changes to the facility as described in the Safety Analysis Report, changes to MNRC procedures, and changes to, or development of, tests or experiments not described in the Safety Analysis Report. The procedure adequately incorporated criteria provided by the regulations. The inspector verified that, as required by procedure, all proposed facility modifications were presented to a Modification Review Committee for screening and classification. In addition to that committee's screening, the packages were required to be reviewed by the Reactor Supervisor and a health physics representative, and then approved by the Facility Director. Safety significant changes and modifications (designated by the facility as Class I and II changes) were required to be reviewed and approved by the NSC.

The Facility Modification Installation Authorization Forms and the associated Facility Modification Checklist forms reviewed by the inspector were completed and closed out properly. The completed packages showed that the proposed modifications were acceptably reviewed in accordance with the procedure. None of the changes or modifications was determined to constitute a safety question or concern and none required a license or TS amendment.

c. Conclusion

The NSC was meeting semiannually, reviewing the topics outlined in the TS, and conducting annual audits of facility programs as required. The facility design change program satisfied NRC requirements.

3. Reactor Operations

a. Inspection Scope (IP 69006)

To verify that the licensee was operating the reactor and conducting operations in accordance with TS Section 3 and procedural requirements, the inspector reviewed selected portions of the following:

- Various UCD/MNRC Startup Checklist Forms for 2012 and to date in 2013
- Selected UCD/MNRC Shutdown Checklist Forms for 2012 and to date in 2013
- Various UCD/MNRC Facility Rounds Log Forms for 2012 and to date in 2013

- Selected UCD/MNRC Operations Log Pages from Log Book No. 138 through Log Book No. 148
- Facility Procedure UCD/MNRC-0016-DOC, "UCD/MNRC Operating Instructions," Rev. 12, approval dated July 29, 2013
- Facility Procedure UCD/MNRC-0073-DOC, "UCD/MNRC Reactor Control Room Computer Operating Instructions," Rev. 3, approval dated June 27, 2006
- 2011 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 25, 2012
- 2012 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 7, 2013

b. Observations and Findings

The inspector reviewed selected UCD/MNRC Startup and Shutdown forms, Rounds Log sheets, and Operations Log entries dating from 2012 through the date of this inspection. The operating logs and checklists were complete and provided an acceptable indication of operational activities. The logs and checklists showed that operational conditions and parameters were consistent with license and TS requirements and indicated that operational limits had not been exceeded.

The logs were also used to record problems with equipment and abnormal events or anomalies. Unplanned shutdowns and inadvertent scrams were also noted in the logs, in addition to being documented in the licensee's Monthly Reports and reported in Annual Reports submitted to the NRC.

The inspector was not able to observe any routine reactor operations during the week because the reactor was shut down for annual maintenance. Various maintenance activities were observed and these tasks were appropriately accomplished in accordance with written procedures or maintenance guidelines.

c. Conclusion

Based on a review of operation records, the inspector concluded that UCD/MNRC reactor operations were conducted in accordance with procedure and the appropriate logs were being maintained.

4. Operator Requalification

a. Inspection Scope (IP 69003)

To verify that the licensee was complying with TS 6.1.4 and the facility Operator Training and Requalification Program, the inspector reviewed selected aspects of:

- Status of active operator licenses
- Selected operator physical examination records for the past 3 years
- Training Schedule for Maintenance of Qualifications for SROs for the 2011–2012 and 2013–2014 requalification cycles

- Operator active duty status documented on MNRC Personnel Reactivity Manipulations and Active Duty Performance Record forms for 2011, 2012, and to date in 2013
- Operator training and lecture attendance records for 2011 through 2013 documented on MNRC Training Attendance Record forms
- Selected records for 2012 and 2013 documented on UCD/MNRC Reactor Facility Annual Operating Test for Senior Reactor Operators and Reactor Operators Forms and MNRC Senior Reactor Operator Requalification Written Examination Forms
- Current Memorandum for the Training Coordinator from B. Klein, UCD/MNRC Director, undated, specifying those individuals who had completed the Requalification Program and were certified to continue operating the reactor and those who were in training
- Facility Procedure UCD/MNRC-0009-DOC, "Selection and Training Plan for Reactor Personnel," Rev. 4, approval dated January 18, 2000
- 2011 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 25, 2012
- 2012 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 7, 2013
- American Nuclear Society Standard 15.4-1988, "Selection and Training of Personnel for Research Reactors," approved June 9, 1988

b. Observations and Findings

As noted above, there were four qualified SROs on staff at the facility. The inspector verified that all operators' licenses were current. As of the date of the inspection, there were five individuals who were designated as "in training" to become reactor operators or senior reactor operators.

The inspector noted that the Requalification Program was being implemented and maintained as required. MNRC Personnel Reactivity Manipulations and Active Duty Performance Records and logs showed that operators were maintaining active duty status as required. A review of the logs and records also showed that training was being conducted in accordance with the approved requalification and training program. Procedure reviews and examinations had been documented as required. Records of quarterly reactor operations, reactivity manipulations, other operations activities, and Reactor Supervisor activities were being maintained. Records indicating the completion of annual operating tests and supervisory observations were also being maintained as required. Biennial written examinations were being completed by the operators as required as well.

The inspector reviewed medical records for the various operators and verified that all operators were receiving the biennial medical examinations required by the program in accordance with American Nuclear Society Standard 15.4-1988.

c. Conclusion

Operator requalification was being completed and being maintained up-to-date as required by the Requalification Program. Medical examinations were being completed for each operator biennially as required.

5. Maintenance and Surveillance

a. Inspection Scope (IP 69006 and 69010)

To verify that the licensee was meeting the requirements of their Preventive Maintenance Program and complying with TS Section 4, the inspector reviewed selected aspects of:

- UCD/MNRC Reactivity Tables
- Danger/Caution Tag Issue Forms and log
- Various Operation and Maintenance Manual procedures
- Various UCD/MNRC Operations Log pages from Log Book No. 138 through Log Book No. 148
- UCD/MNRC Preventive Maintenance Schedule for the Month of December 2013
- Preventive Maintenance Program database maintained on the Control Room computer which included entries denoting equipment history
- McClellan Nuclear Radiation Center Preventive Maintenance System - Twelve Month Schedule for the period from January 2013 through December 2013
- Selected MNRC Work Order forms documenting various completed and pending maintenance tasks
- Facility Procedure UCD/MNRC-0007-DOC, "Maintenance Procedures," Rev. 5, approval dated November 23, 2005
- Facility Procedure UCD/MNRC-0030-DOC, "MNRC Tag-Out Procedure," Rev. 5, approval dated January 24, 2007
- 2011 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 25, 2012
- 2012 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 7, 2013

b. Observations and Findings

During the week of the inspection, the inspector observed the annual shutdown for facility maintenance. Therefore, the inspector was able to observe various maintenance and surveillance activities. These included inspection of the control rods; cleaning, inspecting, and lubricating the transient rod cylinder; cleaning, inspecting, and lubricating the rod drives; and fuel inspection. These activities were conducted in accordance with applicable procedures and the appropriate safety and radiological precautions were taken.

The inspector also reviewed the documentation of other TS-required surveillance activities, such as tests, checks, verifications, and calibrations that had been scheduled through the Preventive Maintenance Program. This was a program that the licensee had developed to schedule and track maintenance and surveillance activities. The records indicated that the required tests, checks, verifications, and calibrations had been completed on schedule and in accordance with licensee procedures. The results reviewed by the inspector were found to be within the TS and procedurally prescribed parameters.

c. Conclusion

The MNRC Preventive Maintenance Program was being used to effectively accomplish maintenance and surveillance activities at the facility.

6. Fuel Handling

a. Inspection Scope (IP 69009)

To ensure that the licensee was following the requirements of TSs 3.2.4, 4.2.4, and 5.3, the inspector reviewed selected aspects of the following:

- Selected Fuel Inspection Sheets for 2013
- Various UCD/MNRC Fuel Transfer Forms
- Selected UCD/MNRC Present Element Location Forms
- Fuel Handling Checklists for fuel handling in December 2013
- Selected entries in the UCD/MNRC Fuel Measurement Notebook
- Various Fuel Movement Sheets developed prior to fuel movements
- Selected UCD/MNRC Fuel Element Tracking Information Log Sheets
- Various entries in the UCD/MNRC Fuel Measurement Data Notebook detailing fuel element measurements
- Selected UCD/MNRC Operations Log pages from Log Book No. 138 through Log Book No. 148
- Selected Visual Inspection Forms completed for fuel elements inspected in 2013
- Core Fuel Status and Storage Boards located in the Control Room and in the Reactor Room indicating fuel element locations
- Facility Procedure UCD/MNRC-0019-OMM 5220, "Fuel Handling Tools," Rev. 4, approval dated January 12, 2009
- Facility Procedure UCD/MNRC-0011-OMM 5240, "Fuel," Rev. 6, approval dated January 3, 2013

b. Observations and Findings

As noted above, the inspector was able to observe the inspection of various fuel elements by licensee personnel. The inspector verified that fuel was moved according to an established plan and in conjunction with the specific fuel movement sheets developed by an SRO for each evolution. The inspector reviewed selected fuel inspection sheets that were completed. The inspections were being completed annually in compliance with TS 3.2.4. It was also noted that fuel handling tools were being properly maintained, controlled, and secured.

During the inspection the inspector also compared the current location of fuel elements in the reactor core with the information maintained on the fuel status board in the control room and on the fuel movement sheets. No problems were noted.

c. Conclusion

Fuel movements and inspections were conducted in accordance with TS and procedural requirements.

7. Experiments

a. Inspection Scope (IP 69005)

The inspector reviewed selected aspects of the following to verify compliance with TS Sections 3.8, 4.8, and 6.5:

- Listing of current experiments and authorized users
- Most recent UCD/MNRC Irradiation Summary Forms
- Selected UCD/MNRC Experimenter Certification Forms
- Various UCD/MNRC Experimenter Approval Request Forms
- Most recent reviews conducted by the Experiment Review Board
- Various UCD/MNRC Irradiation Request Forms for 2012 and 2013
- Selected UCD/MNRC Irradiation Tracking Sheets for 2012 and 2013
- Various UCD/MNRC Operations Log pages from Log Book No. 138 through Log Book No. 148
- Most recent UCD/MNRC Experiment Request Forms documenting Experiment Approval No. K-4-51, "Geochronological Sample Irradiation," UCD/MNRC Director's approval dated September 17, 2013
- Selected Facility Use Authorization Forms which had been completed
- Facility Procedure UCD/MNRC-0027-DOC, "Utilization of the University of California, Davis/McClellan Nuclear Radiation Center Research Reactor Facility," Rev. 7, approval dated January 18, 2000
- Facility Procedure UCD/MNRC-0033-DOC, "University of California, Davis/McClellan Nuclear Radiation Center Research Reactor Facility Experiment Review and Authorization Process," Rev. 5, approval dated July 2, 2003
- Facility Procedure UCD/MNRC-0081-DOC, "UCD/MNRC Experiment Coordination Checklist," Rev. 0, approval dated October 24, 2000
- 2011 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 25, 2012
- 2012 Annual Report for University of California, Davis/McClellan Nuclear Research Center, submitted to the NRC on June 7, 2013

b. Observations and Findings

The inspector reviewed the experiment review and approval process at the facility. It required that an approved experimenter, who decided to propose a new experiment, complete an Experiment Request Form for review. The experimenter was also required to ensure that the proposed experiment would meet the conditions established for one of five approved Facility Use Authorizations. The request was then required to be reviewed by the Experiment Coordinator and the Experiment Review Board, and then be approved by the MNRC Facility Director. The Experiment Coordinator also completed an Irradiation Summary Form to further document approval by the Facility Director,

the Reactor Supervisor, and the Radiation Safety Officer. Any new or revised Facility Use Authorizations were also required to be reviewed and approved by the NSC. It was noted that no new Facility Use Authorizations had been approved since 2000.

The experiments conducted at the facility had been reviewed and approved as required. The inspector noted that two new experiments had been reviewed and approved since the last inspection.

The inspector noted that the experiments conducted at the facility were completed using an approved Facility Use Authorization Number and an Experiment Approval Number and under the cognizance of the Reactor Supervisor and the SRO, and in accordance with TS requirements (e.g., reactivity limitations). The results of the experiments were documented on the appropriate Irradiation Request Forms which listed the conditions of the irradiation and the radiological survey results of the material when removed from the reactor. The forms reviewed by the inspector had been completed as required with the appropriate information included.

c. Conclusions

The program for reviewing and conducting experiments satisfied TS and procedural requirements.

8. Procedures

a. Inspection Scope (IP 69008)

To verify compliance with TS Section 6.4, the inspector reviewed selected portions of the following:

- “Document Review” forms completed by staff members
- “UCD/MNRC Controlled Document Review and Approval Reference List”
- MNRC Document List, including the procedure number, title, individual responsible for reviewing the procedure, and date of the last review
- Facility Procedure UCD/MNRC-0005-DOC, “Document Control Plan,” Rev. 9, approval dated February 16, 2007

b. Observations and Findings

TS Section 6.4 required that procedures be prepared and approved for the activities listed in that section. The procedures were required to be approved by the UCD/MNRC Director. Changes to the procedures also required the approval of the UCD/MNRC Director and all changes were required to be documented. The inspector noted that the appropriate facility procedures had been developed for the activities as required by the TS and had been approved by the Director. Recent changes had also been approved by the Director.

The inspector noted that various members of the facility staff were required to perform periodic reviews of the procedures to assure that they were current. The

completion of these reviews continued to be tracked by the Reactor Supervisor. The inspector determined that biennial reviews of the maintenance procedures and annual reviews of the other types of procedures were being completed as required.

c. Conclusion

The current procedure review, revision, control, and implementation program satisfied TS requirements.

9. Emergency Preparedness

a. Inspection Scope (IP 69011)

The inspector reviewed selected aspects of the following to verify compliance with the UCD/MNRC-0001-DOC, "Emergency Plan for the University of California, Davis - McClellan Nuclear Radiation Center (UCD/MNRC)," Rev. 8, approval by the NSC Chairman dated June 12, 2006:

- 2011 and 2012 emergency drill documentation and critiques
- Memorandum of Understanding (MOU) with the UCD Medical Center, dated May 1, 2006
- Memorandum of Understanding between the County of Sacramento and McClellan Park, dated November 23, 2004
- Training Schedule for Maintenance of Qualifications for SROs for the 2011–2012 requalification cycle
- Facility Procedure UCD/MNRC-0018-DOC, "University of California, Davis/McClellan Nuclear Radiation Center Emergency Procedures," Rev. 7, approval dated November 11, 2007
- Facility Procedure UCD/MNRC-0078-DOC, "UCD/MNRC Emergency Procedures for Emergency Response Personnel – Class 0 Emergency - Personnel and Operation Events," Rev. 2, approval dated October 27, 2005
- Facility Procedure UCD/MNRC-0079-DOC, "UCD/MNRC Emergency Procedures for Emergency Response Personnel - Class I Emergency - Notification of Unusual Events," Rev. 2, approval dated October 27, 2005
- Facility Procedure UCD/MNRC-0080-DOC, "UCD/MNRC Emergency Procedures for Emergency Response Personnel – Class II Emergency - Alert," Rev. 2, approval dated October 27, 2005

b. Observations and Findings

The inspector reviewed the Emergency Plan (E-Plan) in use at the reactor and verified that it was reviewed annually. The inspector reviewed the UCD/MNRC Emergency Procedures as well. It was noted that the procedures were also typically reviewed annually and revised as needed to ensure effective implementation of the E-Plan.

Through records review and interviews with SRO personnel (e.g., emergency responders), the inspector determined that they were knowledgeable of the

proper actions to take in case of an emergency. Training for these individuals had been conducted annually through the Requalification Program and documented acceptably. Training for support organization personnel was provided whenever those organizations' schedules would permit.

The inspector verified that the MOU, dated November 23, 2004, between the County of Sacramento and McClellan Park remained in effect. The MOU stipulated that the Sacramento Metropolitan Fire District would be available during an emergency and would provide support for the facility. The inspector also verified that the MOU between the UCD/MNRC facility and UCD Medical Center remained in effect. That MOU indicated that the UCD Medical Center would provide the MNRC with needed support in case of any event involving a medical emergency.

Communications capabilities with support groups were acceptable and the various equipment (e.g., telephones and the building public address system) were in use daily. Portable public address devices were also available for use as needed and were checked semiannually. Emergency call lists had been revised and updated as needed and were available in the control room and in the various emergency kits as required. The inspector also verified that emergency equipment, including decontamination material, was available and was being inventoried semiannually as required by the E-Plan.

The documentation of the training and drills conducted during the past 2 years was reviewed. Emergency preparedness and response training was being completed, typically during the meetings held to prepare for the periodic drills. Through drill scenario and record reviews, and personnel interviews, off-site emergency responders were determined to be knowledgeable of the proper actions to take in case of an emergency. Emergency drills had been conducted annually and had included participation of off-site support groups every other year as required by the E-Plan. The scenario and critique written for the latest drill were well documented.

The inspector and the facility Radiation Safety Officer visited the UCD Medical Center, observed the facilities and equipment at that location, and interviewed Environmental Health and Safety (EH&S) personnel. The inspector determined that there were adequate supplies and equipment available at the hospital to handle an emergency at the MNRC. It was also noted that the emergency area for handling serious problems at the UCD Medical Center was well equipped and properly staffed. Through talking with EH&S staff, the inspector noted that they were knowledgeable of their duties and responsibilities with respect to the MNRC.

c. Conclusion

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

10. Follow-up on Previously Identified Items

a. Inspection Scope (IP 92701)

The inspector reviewed the licensee's actions taken in response to three previously identified inspector follow-up items (IFIs).

b. Observation and Findings

- (1) IFI 50-607/2006-201-01 (Open) - Follow-up on the licensee's actions to update and correct the organizational chart specified in the TS by submitting the appropriate TS change request.

In August 2006, the inspector determined that the licensee's TS organizational chart for the UCD/MNRC stipulated that the chain of command included an "Operations Manager" who would be in charge of reactor operations and to whom the Reactor Supervisor would report. The chart also included a staff position designated as "HP [Health Physics] Supervisor." Since these two positions were not part of the facility's actual organization structure at the time of that inspection, the inspector questioned the licensee about this. The licensee indicated that a TS change was being prepared, but it was not complete and had not been submitted as of the date of the 2006 inspection.

During this inspection the inspector reviewed this issue with the licensee. It was noted that in 2010, the licensee had completed a TS amendment request which would bring the organizational structure specified in the TS into agreement with actual conditions at the facility. This change had been reviewed and approved by the Chairman of the NSC and the licensee had subsequently submitted it to the NRC. At the time of this inspection, the change was still under review by the NRC. This issue will remain open until the NRC completes its review.

- (2) IFI 50-607/2011-201-02 (Open) - Follow-up on the licensee's actions to improve the biennial operator requalification written examinations through the reduction of overlapping question between examinations.

In February 2011 an inspector reviewed the 2008 and 2010 biennial written examinations taken by the reactor operators at the facility. It was noted that there were an unacceptable number of repeated questions from the 2008 exam to the 2010 exam. The licensee was informed that the issue of improving the biennial operator requalification written examinations through the reduction of repetitive question between examinations would be considered an IFI.

During this inspection the inspector reviewed the licensee's actions taken to improve written examinations. The licensee was in the process of establishing a computer database containing over two hundred questions that could be used to randomly select questions to generate an exam. This would ensure that the questions on each written examination were different and alleviate the problem of repeating questions from one exam

to the next. Because this was still ongoing at the time of the inspection, this item will remain open and will be reviewed during the next operations inspection at the facility.

- (3) IFI 50-607/2012-201-01 (Closed) - Follow-up on the licensee's actions to adequately document emergency drills and critiques at the facility.

In January 2012, the inspector noted that emergency drills had been conducted annually as required and had included participation of off-site support groups every other year as required by the E-Plan. Drill scenarios and critiques had been written following each drill. However, it was noted that little detail was included in the critiques and attendance was not always well documented. Also, the critique write-ups did not typically include strengths and weaknesses identified during the exercise. The licensee was informed that the issue of adequate documentation of drills and critiques would be considered by the NRC as an IFI.

The inspector reviewed this issue. It was noted that the most recent drill conducted by the licensee was completed in October 2012. The drill was well documented and strengths and weakness were identified. Corrective actions for the weaknesses were outlined and were being implemented by the licensee. This issue is considered closed.

c. Conclusion

Three items identified during previous inspections were reviewed during this inspection. One IFI was closed and two remain open.

11. Exit Interview

The inspection scope and results were summarized on December 5, 2013, with members of licensee management and staff. The inspector described the areas inspected and discussed in detail the inspection findings. The licensee acknowledged the findings presented and did not identify as proprietary any of the material provided to or reviewed by the inspector during the inspection.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

H. Bollman	Facility Manager and Senior Reactor Operator (SRO)
T. Essert	Electronics Engineer and Reactor Operator Trainee
W. Frey	UC Davis/MNRC Radiation Safety Officer
B. Klein	Reactor Director
R. Miller	Level II Radiographer and SRO
D. Reap	Health Physics Technician, Security Officer, and SRO
W. Steingass	Associate Director for Reactor Operations and Reactor Supervisor
R. Walker	Radiographer/Mechanic

Other Personnel

L. Kroger	Radiation Safety Officer, Department of Environmental Health and Safety, University of California Davis Medical Center
P. Leinwander	Certified Health Physicist, Department of Environmental Health and Safety, University of California Davis Medical Center

INSPECTION PROCEDURE USED

IP 69003	Class I Research and Test Reactor Operator Licenses, Requalification, and Medical Activities
IP 69005	Class I Research and Test Reactor Experiments
IP 69006	Class I Research and Test Reactor Organization, Operations, and Maintenance Activities
IP 69007	Class I Research and Test Reactor Review and Audit and Design Change Functions
IP 69008	Class I Research and Test Reactor Procedures
IP 69009	Class I Research and Test Reactor Fuel Movement
IP 69010	Class I Research and Test Reactor Surveillance
IP 69011	Class I Research and Test Reactor Emergency Preparedness
IP 92701	Follow-up on Previously Identified Items

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

50-607/2012-201-01	IFI	Follow-up on the licensee's actions to adequately document emergency drills and critiques at the facility.
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Discussed

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| 50-607/2006-201-01 | IFI | Follow-up on the licensee's actions to update and correct the organizational chart specified in the TS by submitting the appropriate TS change request. |
| 50-607/2011-201-02 | IFI | Follow-up on the licensee's actions to improve the biennial operator requalification written examinations through the reduction of overlapping question between examinations. |

PARTIAL LIST OF ACRONYMS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
EH&S	Environmental Health and Safety
E-Plan	Emergency Plan
ERB	Experiment Review Board
IFI	Inspector Follow-up Item
IP	Inspection procedure
MNRC	McClellan Nuclear Radiation Center
MOU	Memorandum of Understanding
NRC	U.S. Nuclear Regulatory Commission
NSC	Nuclear Safety Committee
SRO	Senior Reactor Operator
TS	Technical Specifications
UCD	University of California, Davis
UCD/MNRC	University of California, Davis/McClellan Nuclear Radiation Center