



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 30, 2019

Dr. Wesley D. Frey, Reactor Director
McClellan Nuclear Research Center
University of California, Davis
5335 Price Avenue, Building 258
McClellan, CA 95652-2504

SUBJECT: UNIVERSITY OF CALIFORNIA, DAVIS/MCCLELLAN NUCLEAR RESEARCH
CENTER – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE
INSPECTION REPORT NO. 50-607/2019-203

Dear Dr. Frey:

From August 12 – 14, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the University of California, Davis/McClellan Nuclear Research Center. The enclosed report documents the inspection results which were discussed on August 14, 2019, with you, Mr. Walter Steingass, Reactor Supervisor, and Mr. David Reap, 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 non-compliance 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, 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).

If you have any questions concerning this inspection, please contact Craig Bassett at (240) 535-1842, or by electronic mail at Craig.Bassett@nrc.gov.

Sincerely,

/RA/

Anthony J. Mendiola, Chief
Research and Test Reactors Oversight Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

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

Enclosure:
As stated

cc: See next page

University of California-Davis/McClellan

Docket No. 50-607

cc:

Mr. David Reap, Radiation Safety Officer
5335 Price Avenue, Bldg. 258
McClellan, CA 95652-2504

Mr. Walter Steingass, Reactor Supervisor
5335 Price Avenue, Bldg. 258
McClellan, CA 95652-2504

California Energy Commission
1516 Ninth Street, MS-34
Sacramento, CA 95814

Radiological Health Branch
California Department of Public Health
P.O. Box 997414, MS 7610
Sacramento, CA 95899-7414

Test, Research and Training
Reactor Newsletter
Attention: Ms. Amber Johnson
Dept of Materials Science and Engineering
University of Maryland
4418 Stadium Drive
College Park, MD 20742-2115

Dr. Prasant Mohapatra
Vice Chancellor for Research
Department of Computer Science
University of California
Davis, CA 95616

SUBJECT: UNIVERSITY OF CALIFORNIA, DAVIS/MCCLELLAN NUCLEAR RESEARCH
CENTER – U.S. NUCLEAR REGULATORY COMMISSION ROUTINE
INSPECTION REPORT NO. 50-607/2019-203, DATED AUGUST 30, 2019.

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

Docket No. 50-607

License No. R-130

Report No. 50-607/2019-203

Licensee: University of California, Davis

Facility: McClellan Nuclear Research Center

Location: McClellan Park
Sacramento, California

Dates: August 12 – 14, 2019

Inspector: Craig Bassett

Approved by: Anthony J. Mendiola, Chief
Research and Test Reactors Oversight Branch
Division of Licensing Projects
Office of Nuclear Reactor Regulation

Enclosure

EXECUTIVE SUMMARY

University of California, Davis
McClellan Nuclear Research Center
Nuclear Regulatory Commission Inspection Report No. 50-607/2019-203

The primary focus of this routine, announced inspection was the onsite review of selected aspects of the University of California, Davis (the licensee's) 2 megawatt Class I research reactor safety program, including: (1) operator licenses, requalification, and medical examinations; (2) experiments; (3) organization and operations and maintenance activities, (4) review and audit and design change functions; (5) procedures; (6) fuel movement; (7) surveillance; and, (8) 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.

Operator Licenses, Requalification, and Medical Examinations

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

Experiments

- The licensee's program for reviewing, approving, and conducting experiments satisfied procedural and technical specification (TS) requirements.

Organization and Operations and Maintenance Activities

- The organizational structure and staffing were generally consistent with TS requirements.
- Reactor operations were conducted in accordance with procedures and the appropriate logs were being maintained.
- The preventive maintenance system was being used effectively to ensure that maintenance activities were completed in a timely manner.

Review and Audit, and Design Change Functions

- The facility Nuclear Safety Committee (NSC) was meeting semiannually, reviewing the topics outlined in the TSs, and conducting annual audits of facility operations as required.
- The review, evaluation, and documentation of changes to the facility satisfied NRC requirements.

Procedures

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

Fuel Movement

- Fuel movement and handling was conducted in accordance with procedural requirements and fuel inspections were completed annually as required by the TSs.

Surveillance

- Surveillance activities at the facility were completed within the TS-prescribed time frames as required.

Emergency Preparedness

- The emergency preparedness program was conducted in accordance with the Emergency Plan (E-Plan).
- Emergency response equipment was being maintained and alarms were being tested as required.
- The memoranda of understanding (MOU) between the licensee and various support agencies were being maintained.
- Emergency drills were being conducted annually as required by the E-Plan.
- Emergency preparedness training for operations personnel was being completed.

REPORT DETAILS

Summary of Facility Status

The University of California, Davis (UCD) 2 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 operated up to eight hours per day at varying power levels up to 1 megawatt to support neutron radiography and sample irradiation.

1. Operator Licenses, Requalification, and Medical Examinations

a. Inspection Scope (Inspection Procedure (IP) 69003)

To verify that the licensee was complying with TS Section 6.1.4, and the UCD/McClellan Nuclear Research Center (MNRC) Operator Training and Requalification Program outlined in Facility Procedure UCD/MNRC-0009-DOC-04, "Selection and Training Plan for Reactor Personnel," the inspector reviewed selected aspects of:

- Status of all qualified operators' licenses
- Selected operator physical examination records for the past 3 years
- Training schedule for maintenance of qualifications for senior reactor operators (SROs) for the May 2016 – April 2018 and May 2018 – April 2020 requalification cycles
- Operator active duty status documented on MNRC personnel reactivity manipulations and active duty performance record forms for 2016 through 2018, and to date in 2019
- Operator training and lecture attendance records for 2016 through 2018 and to date in 2019 documented on MNRC training attendance record forms and on the computer data base
- Selected records of UCD/MNRC reactor facility annual operating tests for SROs and reactor operators (ROs) and MNRC SRO requalification written examinations for 2016 through 2018 and to date in 2019
- Current memorandum for the training coordinator from Dr. Wesley Frey, UCD/MNRC Director, dated August 2, 2018, specifying those individuals who had completed the requalification program and were certified to continue operating the reactor and those who were in training
- Various entries documented on UCD/MNRC operations log pages from Log Books Nos. 169 through 177
 - UCD/MNRC 2017 annual report, submitted to the NRC on June 27, 2018
- UCD/MNRC 2018 annual report, submitted to the NRC on June 27, 2019
- American National Standards Institute/American Nuclear Society(ANSI/ANS)-15.4-1988, "Selection and Training of Personnel for Research Reactors," approved June 9, 1988

b. Observations and Findings

There were five qualified SROs on staff at the facility. The inspector verified that all operators' licenses were current. The inspector also reviewed various other forms and records documenting the status of the qualification program. MNRC Personnel Reactivity Manipulations and Active Duty Performance Records and operations 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 completed and documented as required.

Records of the completion of quarterly reactor operations and 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 taken by the operators as well. The inspector also reviewed medical records for the operators and verified that they were receiving the biennial medical examinations required by the program in accordance with ANSI/ANS-15.4-1988. The inspector verified that the Requalification Program was being implemented and maintained as required.

c. Conclusion

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

2. Experiments

a. Inspection Scope (IP 69005)

The inspector reviewed selected aspects of the following to verify compliance with the licensee's program for conducting experiments outlined in Facility Procedure UCD/MNRC-0033-DOC-05, "University of California, Davis/McClellan Nuclear Research Center Research Reactor Facility Experiment Review and Authorization Process," and 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 2018 and to date in 2019
- Selected UCD/MNRC Irradiation Tracking Sheets for 2018 and to date in 2019
- Various entries documented on UCD/MNRC Operations Log pages from Log Books Nos. 169 through 177
- Selected Facility Use Authorization Forms which had been completed

- Facility Procedure UCD/MNRC-0081-DOC-00, “UCD/MNRC Experiment Coordination Checklist”
- The two most recent Annual Reports for UCD/MNRC submitted to the NRC in June 2018 and June 2019

b. Observations and Findings

The inspector reviewed the experiment review and approval process at the facility. It was noted that no new Facility Use Authorizations had been approved since the previous NRC inspection. Also, no new experiments had been proposed or approved since that inspection. The inspector verified that the experiments conducted at the facility had been previously reviewed and approved by the NSC as required.

The inspector noted that the experiments being conducted at the facility were completed 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 (IRFs) which listed the conditions of the irradiation and the radiological survey results of the material when removed from the reactor. Generally, the radiation levels of the material were below detectable limits and the material was free-released. If the radiation level of material involved was above the release limit, the material was transferred back to the organization which submitted it and the licensee verified that that entity had a license which allowed possession of the irradiated material. The IRFs reviewed by the inspector had been filled out properly with the appropriate information included.

c. Conclusion

The program for reviewing, approving, and conducting experiments satisfied TSs and procedural requirements.

3. **Organization and Operations and Maintenance Activities**

a. Inspection Scope (IP 69006)

The inspector reviewed the following regarding the UCD/MNRC organization, staffing, staff responsibilities, reactor operations, and Preventive Maintenance Program to ensure that the requirements of TS Sections 3.0, 6.1, and 6.8 were being met:

- Management responsibilities
- Qualifications of facility personnel
- Current UCD/MNRC organizational structure
- Selected Facility Anomaly Reports
- Staffing requirements for safe operation of the research reactor facility
- ANSI/ANS-15.4-1988, “Selection and Training of Personnel for Research Reactor,” approved June 9, 1988
- Various UCD/MNRC Startup Checklist Forms for 2018 and to date in 2019

- Selected UCD/MNRC Shutdown Checklist Forms for 2018 and to date in 2019
- Various UCD/MNRC Facility Rounds Log Forms for 2018 and to date in 2019
- Selected entries listed on UCD/MNRC Operations Log Pages contained in Log Books Nos. 169 through 177
- Facility Procedure UCD/MNRC-0004-DOC-13, "Technical Specifications for the University of California, Davis/McClellan Nuclear Radiation Center (UCD/MNRC)"
- Facility Procedure UCD/MNRC-0007-DOC-05, "Maintenance Procedures"
- Facility Procedure UCD/MNRC-0016-DOC-12, "UCD/MNRC Operating Instructions"
- Preventive Maintenance System database maintained on the Control Room computer which included entries denoting equipment history
- MNRC Preventive Maintenance System - Twelve Month Schedule for the period from November 2018 through October 2019
- Selected MNRC Work Order forms documenting various completed and pending maintenance tasks for 2018 and to date in 2019
- The two most recent Annual Reports for UCD/MNRC, submitted to the NRC in June 2018 and June 2019

b. Observations and Findings

(1) Organization and Staffing

The inspector reviewed the operations organization at the facility. The current organization consisted of seven individuals: (1) the UCD/MNRC Director, (2) the Associate Director for Reactor Operations/Reactor Supervisor, (3) a Radiography/Facility Manager, (4) a Radiation Safety Officer (RSO)/Security Manager, (5) an Electronics Engineer, (6) a Radiographer, and (7) a newly hired individual. It was noted that the Electronics Engineer worked at the reactor facility half-time and at another facility on the main campus for the remainder of the time.

The subject of facility staffing was reviewed by the inspector. It was noted that five of the individuals mentioned above were licensed SROs. Even though the SROs all had collateral duties that required a portion of their attention, the inspector concluded that staffing for reactor operation appeared to be adequate given the current level of operation at the facility. Staffing requirements for safe operation of the research reactor facility as required by the TSs were being met. The licensee indicated that, because of an increased workload, they had been able to hire a person to assist with the radiography work. It was anticipated that this person would also be trained to become a qualified RO in the future. And, as noted above, another individual was also hired. This person was initially hired to assist with license renewal but would also be helping with radiation protection and radiography duties and eventually be trained as a RO as well.

(2) Operations

The inspector reviewed selected UCD/MNRC startup and shutdown forms, rounds log sheets, and operations log entries dating from 2018 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 observed facility activities during the week including a routine reactor start-up, operations on various occasions, and a shutdown. The operations were conducted in accordance with the applicable procedures and the actions were documented in the required logs.

(3) Maintenance Activities

The inspector reviewed the Preventive Maintenance System that the licensee had developed to schedule and track maintenance activities and surveillance items. A computer program had been designed to produce periodic work schedules and was set up to generate MNRC Work Order forms (MWOs). The MWOs were used to complete and document the required maintenance and/or surveillance activities. The data from each completed MWO was typically entered into the computerized tracking system by the Radiography Supervisor/Building Manager. The inspector verified that the licensee was conducting the various maintenance activities at the frequencies required by their program.

c. Conclusion

The licensee's organization and staffing were generally in compliance with the requirements specified in TS Section 6.0. Reactor operations were conducted in accordance with procedure and the appropriate logs were being maintained. The facility Preventive Maintenance System was used effectively to ensure completion of maintenance activities in a timely manner.

4. 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 the licensee's change process outlined in Facility Procedure

UCD/MNRC-0043-DOC-04, "Facility Modification Procedure," and TS Section 6.2, the inspector reviewed selected aspects of:

- Annual Audits conducted for 2017 and 2018
- NSC meeting minutes for January 2018 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 2015 through the present
- Facility Procedure UCD/MNRC-0045-DOC-04, "Quality Assurance Program for McClellan Nuclear Research Center (MNRC)"
- The two most recent Annual Reports for UCD/MNRC, submitted to the NRC in June 2018 and June 2019
- "Charter of the Nuclear Safety Committee (NSC) for the University of California, Davis/McClellan Nuclear Research Center (UCD/MNRC)," Revision 3

b. Observations and Findings

(1) Review and Audit Functions

Composition of the NSC and qualifications of NSC members were as specified in TS Section 6.2.1. Minutes of NSC meetings demonstrated that the committee met semiannually as required by TS Section 6.2.2, and provided the reviews and oversight specified in TS Section 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 TSs and provided sufficient guidance, direction, and oversight to ensure acceptable use of the reactor.

The inspector noted that the annual operations audit for 2017 was conducted on February 25, 2018, by the Chair of the NSC. The audit appeared to be adequate and covered the activities specified in TS Section 6.2.4, including various aspects of the reactor facility operations and other functions. The operations audit for 2018 had also been conducted by the Chair of the NSC and was completed on February 20, 2019. This audit also appeared to be adequate. No problems were noted in the audits and no recommendations.

It was noted that the Radiation Safety Program audit for 2018 had been performed October 30, 2018. The program audit for 2019 had not been completed to date. The security audit for 2018 was conducted on December 17, 2018.

(2) Change Control Functions

To satisfy the regulatory requirements stipulated in Title 10 of the *Code of Federal Regulations* 50.59, "Changes, tests and experiments," the

licensee had implemented Facility Procedure UCD/MNRC-0043-DOC-04, "Facility Modification Procedure." The procedure was developed to address activities that affected changes to the facility as described in the safety analysis report (SAR), changes to MNRC procedures, and changes to, or development of, tests or experiments not described in the SAR. The procedure adequately incorporated criteria provided by the regulations.

No change requests had been issued within the past year. However, the inspector verified that, as required by procedure, all proposed facility modifications that had been processed in the past 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, and were being, reviewed and approved by the NSC.

c. Conclusion

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

5. Procedures

a. Inspection Scope (IP 69008)

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

- 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-09, "Document Control Plan"

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 facility procedures had been developed for the activities as required by the TSs and had been approved by the Director. The inspector verified that 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 generally being completed as required.

c. Conclusion

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

6. Fuel Movement

a. Inspection Scope (IP 69009)

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

- Selected UCD/MNRC Fuel Transfer Forms
- Various Fuel Inspection Sheets for 2018 and to date in 2019
- Selected UCD/MNRC Present Element Location Forms
- Fuel Handling Checklists for fuel handling in 2018 and to date in 2019
- Various Fuel Movement Sheets developed prior to, and used for, fuel movements during the past 24 months
- Selected UCD/MNRC Fuel Element Tracking Information Log Sheets
- Various entries in the UCD/MNRC Fuel Measurement Log Notebook detailing fuel element measurements
- Selected UCD/MNRC Operations Log pages from Log Books Nos. 169 through 177
- Core Fuel Status and Storage Boards located in the Control Room and in the Reactor Room indicating current fuel element locations
- Facility Procedure UCD/MNRC-0019-OMM-04, 5220, "Fuel Handling Tools"
- Facility Procedure UCD/MNRC-0011-OMM-04, 5240, "Fuel"

b. Observations and Findings

The inspector reviewed the fuel movement process used by the licensee and verified that fuel was moved according to established procedure and in conjunction with specific fuel movement sheets. These movement sheets were developed by an SRO for each evolution and approved by the Facility Director or the Reactor Supervisor. The sheets were used not only for fuel movement, which included transferring fuel from the core to storage and from storage to the core, but for fuel inspections as well. A review of the fuel movement sheets indicated that the licensee was following the approved procedural process.

It was noted that, during the most recent annual facility shut down for maintenance (completed on August 8, 2019), the licensee also completed inspections of those fuel elements specified in the TSs. The inspector reviewed selected fuel inspection sheets and noted that the inspections were being completed annually in compliance with TS Sections 3.2.4 and 4.2.4. The inspector verified that fuel handling tools were being properly maintained and were adequately controlled/secured when not in use.

The inspector compared the current location of selected fuel elements in the reactor core (as illustrated by a printed core configuration or map) with the information maintained on the Fuel Status Boards in the Control Room and the

Reactor Room, and on the fuel movement sheets. Fuel was being used and stored in the locations as indicated and no problems were noted. The licensee's current core was designated as core 30B.

c. Conclusion

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

7. Surveillance

a. Inspection Scope (IP 69010)

To verify that the licensee was complying with TS Section 4.0, the inspector reviewed selected aspects of:

- Selected UCD/MNRC Operations Log pages from Log Books Nos. 169 through 177
- Preventive Maintenance System database maintained on the Control Room computer which included entries denoting equipment history
- MNRC Preventive Maintenance System - Twelve Month Schedule for the period from November 2018 through October 2019
- Selected MNRC Work Order forms documenting various completed and pending maintenance tasks for 2018 and to date in 2019
- Facility Procedure UCD/MNRC-0007-DOC-05, "Maintenance Procedures"
- Facility Procedure UCD/MNRC-0030-DOC-05, "MNRC Tag-Out Procedure"
- The two most recent Annual Reports for UCD/MNRC submitted to the NRC in June 2018 and June 2019

b. Observations and Findings

Routine maintenance work and surveillance activities were typically completed on Mondays during the weekly routine scheduled reactor shutdown. Major maintenance and surveillance items were completed during the licensee's annual maintenance shutdown which typically lasted for one and one-half or two weeks. The inspector reviewed selected data recorded in the system database and on the MWOs for various TS required surveillances. 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 system was being used to effectively complete surveillance activities at the facility in a timely manner.

8. Emergency Preparedness

a. Inspection Scope (IP 69011)

The inspector reviewed selected aspects of the following to verify compliance with the UCD/MNRC-0001-DOC-08, "Emergency Plan for the University of California, Davis - McClellan Nuclear Research Center (UCD/MNRC)," approved by the NSC Chairman dated June 12, 2006:

- Documentation of the 2017 and 2018 emergency drills and critiques
- MOU with the UCD Medical Center, dated May 1, 2006
- MOU between the County of Sacramento and the Sacramento Metropolitan Fire District and McClellan Airport and Park, dated November 23, 2004, concerning fire protection services
- MOU with the Sacramento County Sheriffs' Department, dated December 18, 2000
- Training Schedule for Maintenance of Qualifications for SROs for the 2016-2018 and 2018-2020 requalification cycles
- Facility Procedure UCD/MNRC-0018-DOC-07, "University of California, Davis/McClellan Nuclear Research Center Emergency Procedures"
- Facility Procedure UCD/MNRC-0078-DOC-02, "UCD/MNRC Emergency Procedures for Emergency Response Personnel – Class 0 Emergency-Personnel and Operation Events"
- Facility Procedure UCD/MNRC-0079-DOC-02, "UCD/MNRC Emergency Procedures for Emergency Response Personnel - Class I Emergency-Notification of Unusual Events"
- Facility Procedure UCD/MNRC-0080-DOC-02, "UCD/MNRC Emergency Procedures for Emergency Response Personnel – Class II Emergency-Alert"

b. Observations and Findings

(1) Emergency Plan

The inspector reviewed the E-Plan in use at the reactor and verified that it was reviewed and updated biennially as required. Activities associated with the E-Plan (e.g., training, drills, etc.) were reviewed annually by the NSC. 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.

(2) Memoranda of Understanding

The inspector verified that the MOU 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 was valid. That MOU indicated that the UCD Medical Center would provide the MNRC with needed support in case of an event involving a medical emergency. The licensee also maintained a current MOU with the Sacramento County Sheriff's Department. That MOU

stipulated that Sheriff's Department Deputies would provide the MNRC with immediate support in case of a security event at the facility.

(3) Training

Through records review and interviews with SRO personnel, the inspector determined that they were knowledgeable of the proper actions to take in case of an emergency. Training for facility personnel had been conducted and documented acceptably.

Training for support organization personnel was provided whenever those organizations' schedules would permit. This included walk-through and familiarization tours of the facility for new Fire Department and Sheriff's Department personnel. During the inspection, two Deputies from the Sheriff's Department and an agent from the local Federal Bureau of Investigation office stopped by for a tour of the facility.

(4) Emergency Equipment and Inventories

Communications capabilities with support groups were acceptable and various items of this 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 cache 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.

(5) Drills

The documentation of the drills conducted during the past 2 years was reviewed. Through drill scenario and record reviews and personnel interviews, 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 the participation of off-site support groups every other year as required by the E-Plan. The scenarios written for the drills and the critiques held thereafter were well documented. It was noted that the drill held September 19, 2018, involved 12 adult and pediatric participants with simulated injuries and/or contamination problems. The latest drill had been conducted on June 5, 2019. This drill also involved adult and pediatric patients with simulated injuries and contamination. The drills were conducted in conjunction with the UCD Medical Center. The drills provided challenging scenarios for the facility and the hospital. It was noted that critiques were held following the drills to identify areas for improvement and staff strengths as well.

(6) Offsite Support

The inspector and the Facility Director visited the Environmental Health and Safety (EH&S) office (located next to the UCD Medical Center in Sacramento), observed the facilities and equipment maintained at the Medical Center, and interviewed 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 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. There appeared to be an effective working relationship between the EH&S and UCD/MNRC staff.

c. Conclusion

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

9. Exit Interview

The inspection scope and results were summarized on August 14, 2019, with the Facility Director, the Associate Director for Reactor Operations and the RSO. The inspector described the areas inspected and discussed in detail the inspection findings. The licensee acknowledged the findings presented. Although proprietary material was provided to, and reviewed by, the inspector during the inspection, none of that information is included in this report.

PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

H. Bollman	Radiography Manager/Building Manager, and SRO
C. Dresser	Radiography Contractor and Reactor Operator Trainee
T. Essert	Electronics Engineer and SRO
W. Frey	Director, UCD/MNRC and SRO
D. Reap	Radiation Safety Officer/Security Officer, and SRO
W. Steingass	Associate Director for Reactor Operations/Reactor Supervisor and SRO

Other Personnel

L. Kroger	Radiation Safety Officer, Department of Environmental Health and Safety, University of California Davis Medical Center
E. Rostel	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 Examinations
IP 69005	Class I Research and Test Reactor Experiments
IP 69006	Class I Research and Test Reactor Organization and 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

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

None

PARTIAL LIST OF ACRONYMS USED

ANSI/ANS	American National Standards Institute/American Nuclear Society
EH&S	Environmental Health and Safety
E-Plan	Emergency Plan
IRF	Irradiation Request Form
IP	Inspection Procedure
MNRC	McClellan Nuclear Research Center
MOU	Memorandum of Understanding
MWO	MNRC Work Order
NRC	U.S. Nuclear Regulatory Commission
NSC	Nuclear Safety Committee
RO	Reactor Operator
RSO	Radiation Safety Officer
SAR	Safety Analysis Report
SRO	Senior Reactor Operator
TSs	Technical Specifications
UCD	University of California, Davis