UNIVERSITY OF CALIFORNIA IRVINE (UCI)
NUCLEAR REACTOR FACILITY (NRF)
ANNUAL OPERATING REPORT (AOR)
2023-2024

FACILITY LICENSE R-116 – DOCKET NUMBER 50-326

A. J. SHAKA | Reactor Director

GEORGE MILLER | Reactor Supervisor Emeritus

JOHN KEFFER | Reactor Supervisor and Facility Manager

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Section 1
Operations, Personnel and Reviews Summary

The UCI Reactor Facility has continued to be utilized this year for training operator license candidates, performing neutron activation by campus and visiting researchers, and supporting a Fall quarter radiation chemistry laboratory course.

Personnel

Reactor Personnel this period have changed and are as follows:

Reactor Director: Professor A. J. Shaka (SRO)

Reactor Supervisor Emeritus: Professor George Miller (SRO)

Reactor Supervisor/Facility Manager: Mr. John Keffer (SRO)

Associate Reactor Supervisor and Development Engineer: vacant

Reactor Operators: Ms. Mando Eijansantos (RO) (returning graduate student)

Ms. Jacque Ferrer (RO) (Chemistry staff)

Ms. Jessica Granger-Jones (RO) (graduate student)

Mr. Jonard Ingal (RO) (graduate)

Mr. Victor Klumper (RO) (continuing graduate student)

Mr. Kaneen Muldrow (RO) (undergraduate student)

Mr. John Proctor (RO) (graduate student)

Ms. Jack Shire (RO) (undergraduate student)

Campus Radiation Safety Officer: Ms. Bridgette Neri (RSO) replaced Mr. Aldrich Rivera

Operations

The facility has maintained open status for research and instruction and normal operations throughout the past year.

Operation of this facility supported UCI and visiting research and education programs in the Department of Chemistry (CHEM) and other UCI schools and departments. Research is being conducted in application of radioisotopes as tracers and radiochemical analytical and separation techniques, including focused applications for medical isotope research, and nuclear waste separations. An assistant professor appointed in Chemistry is using the facility for nuclear fuel related research.

Reactor utilization, apart from operator training and maintenance, is for analytical sample irradiation, production of isotopic tracers and medical isotopes, and neutron instrument testing. Analysis samples come from diverse origins related to forensic science, fossil fuels, geochemistry, art, and archaeological studies, chemical separations in nuclear fuel cycle experiments, chemical synthesis, industrial

quality control, enzyme studies, trace element pollution studies, etc. Laboratory classes in September 2023 included work by undergraduates learning tracer and activation analysis techniques using small quantities of short-lived activated materials. The operator training class was renumbered and held this Spring, 2024.

The operator training program continued with twelve new student participants (Chem 252). The students were selected from Chemistry, Physics, and Engineering departments and is open to graduates and undergraduates. Lectures and Discussions were in person, instructed by Professors Shaka and Finkeldei. Lab sessions are continuing in facility for 9 nine students, led by Mr. Keffer, through the Summer, 2024.

Five new RO licenses and one SRO license were awarded to UCI students, staff and faculty during the period following examinations administered by the NRC in October 2023 and May 2024.

Use was made of the facility by other educational institutions, using the reactor and the gamma irradiator. The tour program of the reactor facility has continued, attracting visitors from within the University and area schools as well as the outside professional community. In person tours were also available for potential graduate students.

Operations increased over last year, with the reactor generating over 40% more energy and the facility receiving over 870 visitors and researchers.

Criticality was achieved for 262.1 hours, a 29% increase from the previous year, and the total energy generated was equivalent to 119.3 hours at full steady state power. 309 separate experiments were performed this year, and 711 samples were irradiated, showing a sustained use of the facility. Use of the pneumatic transfer system increased and CT experimental N_2/air flushing was routinely performed, accounting for some associated Ar-41 release. No pulse was performed this year. A few unusual maintenance/surveillance results/activities were noted/conducted during this period and are described in Section 6.

Inspections and Reviews

A routine annual NRC inspection was held February 5-8, 2024, with a focus on: (1) organization and staffing; (2) operations logs and records; (3) requalification training; (4) surveillance and limiting conditions for operation (LCO); (5) emergency planning; (6) maintenance logs and records; and (7) fuel handling logs and records. The U.S. Nuclear Regulatory Commission (NRC) staff determined that the licensee's programs were acceptably directed toward the protection of public health and safety, and in compliance with NRC requirements. A written report was received March 22, 2024. No findings of significance were identified.

An Emergency/Security exercise was conducted on site in March 2024. On and off campus emergency response personnel were involved in the event and participants toured the reactor facility. In preparation for this event several Zoom planning meetings were held in 2023-24. A full follow-up after action report was prepared and issued by UCI Emergency Service personnel.

In April 2024, the required annual Reactor Operations Committee meeting was held remotely via Zoom and Google drive. No significant issues were discussed.

Inspections/audits continue to be conducted quarterly by the Radiation Safety staff of EH&S at UCI. These have identified that surveillance frequency schedules have been properly maintained, and results continue to show absence of significant levels of contamination or personnel exposure.

Section 2

Data Tabulations for the Period July 1st, 2023 to June 30th, 2024

TABLE I – General Information

Experiment Approvals on file (active)	4
Experiments performed (including repeats)	288
Samples irradiated	711
Energy generated this period (Megawatt hours)	29.81
Total, 69 element core	127.00
>74 element core	1769.57
Total energy generated since initial criticality (Megawatt hours)	1896.57
Pulse operation this period	0
Total reactor pulses to 6/30/2024	1115
Hours critical this period	262.1
Total hours critical to date	11466.4
Inadvertent scrams or unplanned shutdowns or events at power	28
Non-research personnel visits to reactor – logged and PRM issued (incl. tours)	724
Maximum dosimeter recorded for visits - all less than 1 mrem (non-researchers)	0.4
Visiting researchers (Temporary PRM, incl. repeats)	155
Maximum exposure recorded at one visit (mrem, Temp PRM, researcher)	1.2
Staff and researchers badged with Thermoluminescent Dosimeters (TLD)	12
Students and assistant, or operators training – (TLD badged)	35
Exposures reported for radiochemistry class (2023-24), deep mrem ave.	3
Isotope Shipments off campus this period	2

TABLE II – Reactor Core Status 2024-06-30 (Core Configuration last Changed 2024-01-10)		
Fuel elements in core (including 2 fuel followers)		88
Fuel elements in storage (reactor tank - used)		19
Fuel elements unused (4 instrumented elements + 1 element + 1 FFCR)		6
Graphite reflector elements in core		29
Graphite reflector elements in reactor tank storage		5
Water filled fuel element positions		3
Experimental facilities in core positions		8
Non-fueled control rods		2
Total core positions accounted for		127
Core excess, cold, no xenon (as of 6/27/2024)		$2.73
Control Rod Worths (Calibrated 01/26/2024)	REG	$2.10
	SHIM	$3.66
	ATR	$1.70
	FTR	$0.81
	Total	$8.27
Maximum possible pulse insertion (calculated)		$2.51
Maximum peak power recorded (no pulse operation during this period)		- MW
Maximum peak temperature recorded in pulse (B-ring)		- °C

Section 3
Inadvertent Scrams, Unplanned Shutdowns, Events at Power

TABLE III – Scrams, Unplanned Shutdowns, Events at Power			
2023-07-18		S/D	FTR UP Light Problematic
2023-07-24		<1.5W	FTR UP Light Problematic
2023-08-15		S/D	SHIM drive UP and DOWN Illuminated
2023-08-15		<1.5W	SHIM drive UP and DOWN Illuminated
2023-08-15		225kW	SHIM drive UP Illuminated – the UP/DOWN simultaneous and spurious UP illumination was traced to the push rod micro-switch on the drive. The micro-switch was cycled and the problem cleared.
2023-08-15		<1.5W	WRM period scram (erratic, circuit noise)
2023-08-28		S/D	WRM period scram (erratic, circuit noise)
2023-08-28		S/D	FTR Chatter on TRANS ROD FIRE (relay not released – ATR scram switch relay not released)
2023-10-03		<1.5W	FTR Chatter on TRANS ROD FIRE (ATR scram switch relay not released)
2023-10-12		S/D	Mode Switch in Pulse for Recorder Training, changed to SS for S/U
2023-10-19		<1.5W	FTR UP Light Problematic
2023-11-09		<1.5W	WRM period scram, FTR chatter on FIRE
2024-01-23		SD	WRM period scram, air scram button relay not released
2024-01-24		SD	WRM period scram, air scram button relay not released
2024-01-25		1.5W	WRM period scram, cell phone in proximity
2024-01-31		<1.5W	FTR UP Light Problematic
2024-01-31		185kW	WRLM scrams, gain adjust during calibration (SOP 4.3 expected)
2024-02-29		SD	FTR UP Light Problematic
2024-02-29		250kW	FTR UP Light Problematic
2024-03-04		<1.5W	WRM period scram, air scram button relay not released
2024-03-18		<1.5W	FTR UP Light Problematic
2024-03-19		SD	WRM period scram, air scram button relay not released, FTR UP Light Problematic
2024-04-15		SD	WRM period scram, air scram button relay not released
2024-04-22		SD	WRM period scram, air scram button relay not released
2024-04-30		SD	WRM period scram
2024-05-06		<100kW	FTR UP Light Problematic
2024-05-06		<100kW	WRM period scram, circuit noise
2024-05-07		250kW	FTR UP Light Problematic

Section 4
Non-Routine Maintenance and Surveillance and Other Incidents

The following non-routine maintenance/surveillance activities were carried out during this period. As noted earlier, routine surveillance and operations were established as of the start of this review period.

TABLE IV – Maintenance, Surveillance, and Other Incidents

2023-08-02		Ventilation Pressure and Flow Balancing In response to occasional difficulty completing the required ventilation surveillances for normal and emergency flows and pressure differentials, UCI Facilities Management together with building controls experts checked the systems, ducting, and emergency filters. Inlet supply ducting was resealed. Emergency flow setpoint was increased 10% to improve the system's ability to make up for leakages and maintain negative pressure differential in the reactor room.
2023-08-18		SHIM Drive Push Rod Micro Switch SHIM Rod Drive full UP/ full DOWN Lights were simultaneously illuminated and the UP light incorrectly ON on several occasions until it was determined that the local drive push rod micro-switch was sticky and needed to be cyclically exercised to resolve the problem. The push rod, when driven up at the top of the drive stroke, indicates the drive is UP. However, the switch was not releasing and stayed ON, or came ON intermittently, even when the drive was fully inserted and DOWN (pull rod micro switch) and/or not fully UP.
2023-11-13		CT condensation dry out practice implemented Discovery of minimal accumulation of liquid water in bottom of CT following extended sample cooling warranted swabbing terminus.
2023-12-20		Quinquennial Fuel Inspections completed Three cameras facilitated inspection, measurement, and fuel movement efforts.
2024-01-11		Reconnection of FTR drive power following core reassembly Power connection restored prior to performing annual surveillances/return to service.
2024-04-08		Purification System dP transmitter connections reseated Cause of downscale indication traced to loose barrel connectors at junction box.

Section 5
Facility Changes and Special Experiments Approved

Four (4) 10 CFR 50.59 change screenings were initiated and completed during the year:

2023-03	8/3/2023	Increase Emergency Ventilation Duct Purge Flow Setpoint
2023-04	12/11/2023	Core Loading Changes for Three Element Irradiation Facility
2024-01	2/22/2024	Experiment 10, Three Element Position water filled irradiation facility
2024-02	3/22/2024	UCI SOP changes and updates, rev 3.3b.

One new experiment (#10) involving the reactor was approved during the period.

Section 6
Radioactive Effluent Release
(a) Gases

The major direct release to the environs is Argon-41 produced during normal operations. Very small amounts of other gases may be released from irradiated materials in experiments.

Releases are computed based on original measurements at point of origin within the facility and taking only dilution into account. Since much of the release is from operation of the pneumatic transfer system for samples, this is a conservative estimate in that the assumption is made that all use of the PT is at full steady state power level (250 kW) when, in fact, considerable use is with the reactor at a lower power level. In view of the small numbers involved, and the fact that an integrated dose check is provided by an environmental dosimeter hanging on the side of the exhausts at the point of entry to the fan creating the stack discharge, it is considered unnecessary to provide further checks of these estimates. The dosimeter data confirm that an individual standing directly in the exhaust flow for one year would receive an additional submersion dose from the exhaust less than the reliability limit of the dosimeters, or less than 20 mrem per year. The dosimeter data are presented separately in section 7. Over the years that data have been collected, the accumulated exposure at the exhaust locations have been lower than for "control" points because of lower masses of concrete structures in the vicinity. In fact, the data have been consistent at about 20 mrem per year below control level, and >30 mrem below a distant check level (5th floor library) so confidence of exposure less than 5 mrem over background seems plausible.

Release estimates based on operational parameters are as follows:

TABLE V – Radioactive Effluent Release Estimates	
Operation of pneumatic transfer system - 07/01/2023 - 06/30/2024:	
A. Minutes of Operation (minutes):	1216
B. Release Rate Assumed (µCi/mL):	6.0 E-08
C. Flow Rate of Exhaust Air (mL/min):	1.2 E+08
D. Dilution Factor (unitless):	0.01
E. PT System Release Computed (µCi): A*B*C*D = E:	87.55
Release from pool surface – 07/01/2023 – 06/30/2024:	
F. Total Hours of Operation at Full Power (EFPH):	119.25
G. Release Rate Assumed (µCi/mL):	1.0 E-08
H. Flow Rate of Exhaust Air (mL/min):	1.2 E+08
I. Dilution Factor (unitless):	0.01
J. Pool Surface Release Computed (µCi): F*G*H*I*60 = J:	85.86
Total Emissions from PT and Pool (µCi): E + J:	173.41
Total Effluent Released in One Year (mL): 525960 min / year*H*I	6.31 E+11
Average Concentration Released (µCi/mL): Total Emissions / Total Effluent	27.5 E-11

Since 2.0 E-09 µCi/mL provides an annual exposure for constant immersion of 10 mrem, this corresponds to < 2 mrem potential additional radiation exposure to an individual standing in and breathing in the effluent stack for the entire year, a zero-likelihood event. *Note*: Minutes of operation includes PT air blower minutes and CT minutes with N_2/air cooling. *Additional note*: the mixed and diluted exhaust plume is discharged to approximately 100 feet above the roof level (200 feet above surrounding ground), granting even greater dilution.

(b) Liquids and Solids

Liquid and solid wastes from utilization of by-product materials are disposed through a university contract. Waste is transferred to the custody of UCI Environmental Health and Safety (EH&S). Disposals to this custody are given below. It is important to note that activity values are estimated at the time of transfer to EH&S control. Since few shipments are being made from campus, decay to negligible levels occurs for all medium-lived radionuclides. Teaching course items (used for training in liquid scintillation counting techniques) may be a mixture of reactor generated byproducts including ^{3}H from ^{6}Li irradiation and purchased materials (exclusively ^{14}C). During this period, advantage continued to be taken of a campus program to dispose of additional legacy radioisotope materials including decayed sealed sources and measurement samples, mostly not UCI reactor related.

Production of radioactive waste materials has been minimal during this period.

Liquid Waste:

One liquid waste transfer was made this period.

1. 1 container, 0.1 gal (about 100 4ml vials) of waste from sample disposal following activation analysis, including hydrocarbon distillates, activity ^{76}As (<0.1uCi) and ^{226}Ra (0.007mCi).
2. 1 container, 2 ft^3 of waste of liquid scintillation cocktail vials in bag lined box, with $^{122/124}Sb$ (<1uCi); (3H and 14C activity, <200dps)

Solid, Dry Waste:

One solid dry waste transfer was made this period.

1. 1 container, 2 ft^3, glove waste, $^{122/124}Sb$ (<1uCi).
2. 1 container, 2 ft^3, dry solids, ^{54}Mg, ^{59}Fe (<1mCi)
   ^{46}Sc, ^{166}Ho, ^{238}U, $^{122/124}Sb$ (<150uCi)
   ^{153}Gd (<1uCi)
3. 1 container, 0.5 ft^3, sharps, ^{60}Co (<0.008uCi)
4. 1 container, 1 ft^3, dry solids, ^{58}Co (0.002mCi)
   ^{46}Sc (0.002mCi)
   ^{110}As (0.0002mCi)
   ^{226}Ra (0.009mCi)

Section 7
Environmental Surveillance

Environmental dosimeters are in place at 12 locations around the UCI Campus for environmental monitoring purposes. These are provided by Mirion Technologies, Oak Ridge, TN (formerly in Irvine, CA). The environmental packs have three chips in each pack which are averaged for exposure recording. Mirion runs multiple control samples in addition to the locations listed below. All dosimeters are housed in small metal locked boxes (except for locations 10 and 12). The tables below list the locations. As work in Engineering Tower 521 had ceased, the dosimeter there was redeployed to the storage closet across the hall from the east side of the reactor facility. Other locations have been renamed to agree with the locations in the revised ventilation system provided for Rowland Hall, and a new laboratory constructed on the former loading dock adjacent to the north side of the facility.

Routine contamination surveys consisting of wipe tests and G-M surveys have shown mostly a "clean" facility with significant, removable contamination only in areas coming into direct contact with samples removed from the reactor, and on sample handling tools. Trash is surveyed before disposal and not disposed of unless found to be free of removable and fixed contamination.

Table VI - Locations for Environmental Dosimeters
1. South Reactor Facility Perimeter
2. West Reactor Facility Perimeter
3. North Reactor Facility Perimeter in adjacent lab of Atmospheric Chemistry group
4. Rowland Hall Roof Air Exhaust Duct to Fan 1
5. Rowland Hall, First Floor Hallway Over Reactor Facility
6. McGaugh Hall Top (5^{th}) Floor
7. Langson Library Top Floor
8. Reines Hall Top (5^{th}) Floor
9. Rowland Hall Roof Air Exhaust Duct to Fan 2
10. On-campus Faculty Housing
11. Rowland Hall Roof Air Exhaust Duct to Fan 3
12. Reactor Storage Closet Rowland Hall East side of facility

Table VII – Environmental Dosimetry Data

Average Total Exposures in mrem (Including Control Background)

Location	***Quarter***				***Annual***	***Prior Year***	***Above Control***
	2023 Q2	**2023 Q3**	**2023 Q4**	**2024 Q1**			
1. S. Facility Perimeter	**25**	**28**	**31**	**31**	115	130	6
2. W. Facility Perimeter	**27**	**28**	**33**	**32**	120	132	11
3. N. Facility Perimeter	**27**	**31**	**33**	**33**	124	130	15
4. Facility Air Exhaust Fan 1	**18**	**20**	**23**	**25**	86	97	-23
5. Hallway Over Facility	**22**	**23**	**25**	**28**	98	107	-11
6. McGaugh Hall Top Floor	**24**	**25**	**27**	**29**	105	112	-4
7. Langson Library Top Floor	**28**	**30**	**35**	**35**	128	142	19
8. Reines Hall Top Floor	**25**	**25**	**29**	**30**	109	121	0
9. Facility Air Exhaust Fan 2	**19**	**21**	**24**	**26**	90	104	-19
10. On-Campus Housing	**19**	**20**	**23**	**26**	88	105	-21
11 Facility Air Exhaust Fan 3	**19**	**22**	**23**	**25**	89	100	-20
12 E. Facility Closet	**23**	**25**	**28**	**29**	105	115	-4
Background Control	**25**	**26**	**29**	**29**	109	127	0

Discussion

Raw data is presented here, along with controls and prior year comparisons. Within this range, the data sets vary relatively little. Locations on walls bordering the facility, such as 1, 2, 3, are usually the highest, whereas remote locations, such as 10, 5, 6, 12, and 8, aside from the diluted facility exhausts, are the lowest. Data for this year reflects several issues:

- Location 7 is on the top floor of a large building and may experience greater cosmic flux, as well as concrete releases. This has been a result continuing for many years.
- Location 1 near the facility's gamma irradiator, as well as a lead cave which continues to store a higher activity load.
- Location 2 is on the other side of a location in the reactor facility temporarily used for source storage.
- Location 3 is on the other side of a concrete wall from the ion exchange resin tanks and a second lead storage cave which have moderate levels of activity. This location is also in a radiation use laboratory, which may be contributing to the higher dose readings but more likely due to TNORM in the concrete wall and floor.

Conclusion

Exposure estimated to a single individual in any uncontrolled area at this facility is minimal. With the exception of three locations nearest the facility, all dosimetry associated with exposures from the facility indicates lower than control levels. Locations 1 and 2 are in hallways with extremely minimal occupancy or travel, especially since security policy is to maintain permanently locked doors to the hallways on this floor level (access only with building keys), and location 3 is in an adjacent radiation use laboratory. The hallway overhead (location 5) is only casually occupied and not close to a main building entrance. The air released from the facility/building (measured by locations 4, 9, and 11) continues to give no detectable exposure above background. Over many years, the data at each specific location has shown remarkable consistency. The net conclusion is that, within precision of measurement, and compared to distant control areas (numbers 7 and 10), we are operating within statistical error of zero of potential (full 24/7 occupancy) public exposure over normal background levels.

Section 8
Radiation Exposure to Personnel

UCI issues TLD badges to students or researchers regularly utilizing radiation within the facility. Finger dosimetry (TLD) rings were also issued to all those personnel, as there is a strong likelihood of regularly handling radioactive sources. TLDs were read quarterly by Mirion Technologies, and results are presented in Table VIII. Data are for 4 quarters of operations since April 1, 2023. Reporting categories are deep, eye, shallow, and ring shallow. Neutron dosimetry badging was discontinued owing to absence of any recorded exposure greater than zero after many years. Other individuals visiting or casually working in the facility were issued Personal Radiation Monitors (PRM) DMC 3000s (aka EPDs) for which results are shown in Table IX. 12 persons were issued TLD badges and finger TLDs on a continual basis. Researchers, operator trainees, and radiochemistry lab students have also been issued TLDs.

Table IX also lists all visiting individuals that were issued DMC 3000s (PRM) that record in units of 0.1 mrem. Over the span of a few hours, a typical worker could accumulate 0.2 mrem background. A tour visitor usually accumulates 0.0 or 0.1 mrem during a 45-minute visit to the facility.

TABLE VIII
Aggregate Personnel Exposure from TLD (mrem) 2023-04-01 to 2024-04-01

Group	Individuals	Whole Body			Ring
		Deep	Eye	Shallow	Shallow
A	8	162	168	175	448
B	2	24	24	25	25
C	2	16	16	16	24
D	35	101	100	155	148
Total	**47**	**303**	**308**	**371**	**645**

TABLE IX
Data from EPDs for Workers and Visitors

Group	Persons Admitted*	Max Dose (mrem)	Total Dose (mrem)
A	95	0.6	6.5
B	2	0	0
C	98	0.4	1.2
D	13	0	0
E	671	0.2	5.3
Total	**879**		**13.0**

* Multiple admissions of the same individual are separately counted. 722 unique individuals were logged in.

Group A: Activation Analysis Personnel: individuals doing extensive or casual activation analysis and radiochemical work at the facility. Most of the exposure is a result of ^{38}Cl, ^{28}Al, or ^{226}Ra radioactivity production/handling.

Group B: Workers: individuals receiving exposure from the handling isotopes for shipment, and/or sources used for calibration activities in the facility.

Group C: Inactive / Other: individuals who did enter but not directly carry out radiation related activities during this period, therefore any exposure reported is an indication of range of general background (for PRM) or background and precision where the TLDs are stored when not in use. This group includes visiting researchers admitted to review facilities for potential experiments, those bringing and taking away samples exposed in the cesium gamma irradiator in the facility and maintenance workers NOT doing work on radiation related systems all of whom are always issued EPD. [Note: Operation of the gamma irradiator is restricted to badged staff personnel].

Group D: Class Students: Radiochemistry Lab (133L) and Operator Training (199/299, 100, 252).

Group E: Tourists: includes tour groups that entered the facility this period.

Personnel exposures continue to be very low at this facility in keeping with ALARA efforts and the low degree of operations experienced. Eight individuals performed activation analysis activities this period. Handling activities of ^{38}Cl, ^{24}Na, and ^{226}Ra containing samples leads to some exposure. No radiation exposures received were greater than 25% of that allowed.

Section 9
Closing Remarks

The facility has seen sustained numbers of visitors and an increase in the hours of use for instruction and research from last year. Key personnel departure and retirement are being addressed to ensure continued function. Waste generation and disposal has remained at its traditionally low values, given the low power of the reactor and the capacity for short term storage of materials. Some activated hardware from SPND testing and medical isotope development have been generated and stored for later disposal. Radiation exposure to personnel also remains low, attributing most dose absorbed per person to the activation analysis activities of the facility or to handling of calibration sources.

The increase in facility activities has been supported by increased involvement of the Reactor Director, Supervisor Emeritus, and Radiochemistry faculty. Licensed operator status and new candidate training has received increased focus.

An Assistant Professor of Chemistry, while assuming teaching roles within the radiochemistry program, is implementing a radiochemistry and nuclear fuel-oriented research program with growing research group membership and summer student participants.

It is anticipated that full operations including laboratory classes, tours and research, and selected improvements to the facility will continue in the coming year.