CASE WESTERN RESERVE UNIVERSITY

DEPARTMENT OF ENVIRONMENTAL HEALTH & SAFETY

RADIATION SAFETY
ANNUAL REPORT 2025-2026

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INTRODUCTION

This report is submitted to the president and designated members of the senior administration of the University as required by the Radiation Safety Committee's (RSC) operating guidelines and Case Western Reserve University's State of Ohio (Nuclear Regulatory Commission Agreement State) Broad Scope License. The report summarizes the activities of the Radiation Safety Office (RSOF) of the Department of Environmental Health & Safety (EHS) at Case Western Reserve University (CWRU). Its contents cover the period from 7/1/2025 – 6/30/2026.

SUMMARY

DEPARTMENT STRENGTHS

The Radiation Safety Office and Facilities (RSOF) comprises a highly experienced and multidisciplinary staff with the expertise necessary to address and effectively resolve a broad range of radiation safety matters at Case Western Reserve University (CWRU). The RSOF develops, implements, and maintains comprehensive radiation safety programs that meet or exceed applicable regulatory requirements and established standards of practice. Through ongoing assessment of regulatory developments and emerging safety considerations, the RSOF proactively identifies opportunities to strengthen and enhance the University's radiation safety programs. New and revised initiatives are advanced through the University's Radiation Safety Committee (RSC), providing an established framework for institutional oversight and governance. The effectiveness and sustainability of these programs are further supported by strong administrative infrastructure and dedicated administrative support.

COLLABORATIVE PARTNERSHIPS

The RSOF maintains strong and productive collaborative relationships with University departments engaged in the development and implementation of safety-related initiatives, as well as with external agencies and organizations committed to advancing environmental health and safety and enhancing environmental quality within University facilities.

RADIATION SAFETY ACCOMPLISHMENTS FOR 2025-2026

Over the past year, the Radiation Safety Division of Environmental Health and Safety (EHS) continued to strengthen and enhance the effectiveness of the University's Radiation Safety Program. Key accomplishments and program improvements during the 2025–2026 reporting period include:

- **Enhanced Radiation and Laser Safety Training:** Radiation and Laser Safety training presentations were converted to the new Canvas format, with the training content integrated directly with the associated knowledge assessment quiz to improve training delivery, consistency, and documentation.
- **Integration of Ancillary Radiation Training:** Following a comprehensive review of EHS training programs, Ancillary Radiation Training was integrated into the Canvas training modules for Hazard Communication, OSHA Police/Security, Custodial/Housing, Facilities, ARC, and HEC. This integration eliminated the need for separate Ancillary Radiation training reminders and reduced duplicate training notifications. The AncRad and AncRadFac options were subsequently removed from the OnSite system. Weekly

data entry will continue for initial Hazard Communication and Biosafety Training, while retraining will be recorded under the applicable integrated training categories. The training management system will continue to be monitored twice monthly to identify and resolve discrepancies and ensure accurate training records.

- **Sealed Source Disposal:** Seven obsolete sealed sources, including pellets, discs, and resin sources collected from liquid scintillation counters (LSCs) and other equipment, were successfully disposed of through the U.S. government's SCATR program. In November 2025, Bionomics facilitated the disposal at a substantially reduced cost, resulting in both regulatory compliance and cost savings for the University.
- **Lead Recycling Initiative**: In May 2026, following nearly a decade of collection efforts, the Radiation Safety Division successfully coordinated the recycling of accumulated lead materials in collaboration with Bedford Recycling. The ARSO led this initiative, with participation from the entire Radiation Safety staff and additional EHS personnel. Utilizing the EHS truck, the team transported more than one ton of lead materials for recycling. The resulting proceeds were credited to the CWRU RSOF account, providing additional financial benefit to the program while supporting the University's sustainability objectives.
- **Key Recovery and Recycling:** More than 200 surplus keys accumulated over the years from vehicles, master-key systems, inspections, equipment, and individual units were collected and returned to the CWRU Key Shop for potential reuse and recycling. This effort reduced unnecessary inventory while supporting responsible resource management.
- **The Dental Bus X-ray registration** has been terminated, and the two X-ray units previously associated with the bus have been transferred to CWRU's General X-ray Registration for inventory management and eventual disposition. To comply with Ohio Department of Health (ODH) requirements, the bus was relocated to Mt. Sinai Parking Lot #19, and the registration was transferred to Syed Ali. An inventory review confirmed three X-ray units, with one active and two inactive. Due to the lack of funding for vehicle upgrades and a driver, the units have remained unused and in storage, with no foreseeable plans for future operation.
- **Program Cost Savings:** Through in-house meter calibration, recycling initiatives, and decay-in-storage programs, the Radiation Safety Division generated an estimated $15,430 in cost savings during the 2025–2026 fiscal year through services provided to the CWRU research community. These efforts demonstrate the Division's continued commitment to operational efficiency, resource conservation, regulatory compliance, and cost-effective support of University research activities.

RADIATION SAFETY GOALS FOR 2026-2027

The continuing goal of the Radiation Safety Program is to position Environmental Health and Safety (EHS) as a strategic partner in advancing the University's educational and research missions through effective training, program development, and proactive safety support. A complementary goal is to strengthen the University's positive impact within the surrounding community through collaboration, education, and coordinated preparedness with local partners including Northeast Ohio Health Physics Society (NOCHPS), student groups, other RSOs, Public Safety, and emergency responders. Current strategic priorities include:

- **Radiation Clearance and Operational Efficiency:** Continue to provide timely radiation clearances while maintaining full compliance with University policies and regulatory requirements. Streamline the clearance process through enhanced communication and coordination with principal investigators, laboratory personnel, and Facilities staff.

- **Radiation-Generating Equipment Safety:** Strengthen oversight of the Radiation-Generating Equipment (RGE) Safety Program in response to the continued growth of X-ray equipment, particularly within the School of Dental Medicine diagnostic units and analytical facilities across campus.
- **Laser Safety:** Enhance oversight and risk-based management of the Laser Safety Program through standard operating procedures, in response to the increasing number and diversity of laser systems across campus, including Class 1, 2, 3R, 3B, and 4 lasers.
- **Irradiator Planning and Preparedness:** Continue planning and preparation for the acquisition of an X-ray irradiator through the U.S. Department of Energy (DOE) Office of Radiological Security (ORS), anticipated in Spring 2027. This effort will include coordination of regulatory, operational, facility, and safety requirements necessary to support implementation.
- **ISEB construction** is progressing well, with occupancy anticipated in October–November 2026. The facility will support X-ray and laser inventories; however, no radioactive material inventory is planned.
- **The Pathology Institute** is scheduled to transfer back to UH in January 2027. Researchers currently housed in the Pathology Building are relocating to the fourth floor of Robbins and the first floor of Wood Research Tower through Fall 2026. Prior to the transfer, laboratories must be decommissioned to address radiation, prions, biological hazards, and chemical use in accordance with applicable safety and regulatory requirements.
- **QUAD Buildings:** CWRU President Kaler toured the QUAD buildings (Engineering and Arts & Sciences) and identified 85 spaces requiring decommissioning of radioactive materials, X-ray and laser equipment, biological materials, chemicals, and waste. Decommissioning is planned for July–December 2026, after which the spaces will be reallocated to incoming principal investigators (PIs).
- **CWRU's General X-ray Registration for inventory management:** In preparation inspection in July 2026, the most recent ODH inspection report of the Dental Bus was provided to the Dental Clinic for recordkeeping, and corrective actions have been reported as completed. The two inactive units are to be maintained at the HEC Dental Clinic for storage and inventory verification, as applicable. Continued documentation and inventory oversight will support regulatory compliance and readiness for future ODH inspections.

OHIO DEPARTMENT OF HEALTH LICENSE

Case Western Reserve University (CWRU) maintains one broad-scope license issued by the Ohio Department of Health (ODH) authorizing the possession and use of accelerator-produced and naturally occurring radioactive materials (RAM) for research and experimental purposes. The license also authorizes the licensed use of two irradiators. The most recent ODH broad-scope license site visit was conducted on October 30, 2025.

The University also maintains two ODH registrations for radiation-generating equipment (RGE). These registrations authorize the receipt, possession, use, storage, and disposal of radiation-generating equipment, including dental X-ray systems, X-ray diffraction units, and fluoroscopy equipment. The ODH inspection of the dental bus mobile X-ray units was conducted on December 13, 2025, and the general ODH RGE inspection was conducted December 12–19, 2023.

ODH LICENSE	EXPIRATION DATE	PURPOSE
011-011800-11	January 1, 2030	Broad Scope License
09-M-06944-12	May 31, 2027	Radiation-Generating Equipment Registration
06-E-06944-020	March 31, 2027	Radiation-Generating Equipment Registration (Bus Mobile Units)

DECOMMISSIONING FUNDING PLAN

The CWRU broad scope license and the decommissioning funding assurance approval became effective in 2/2025. Before 10/2019, the University was required to maintain a standby letter of credit to cover possible costs if the University's broad scope license required rapid decommissioning. The funds required for this letter of credit depended on the kind and amounts of RAM maintained in active use or waste by the University. The University now operates under an agreement with ODH that requires no letter of credit but is dependent on the University's good financial standing. This agreement covers all possible decommissioning costs for RAM located at the University as long as the University's credit rating is maintained.

RADIOACTIVE MATERIAL USE AND STORAGE LOCATIONS

RAM and/or RGE are located at the following facilities:

- Main campus of Case Western Reserve University, 10900 Euclid Avenue, Cleveland, Ohio 44106
- University Hospitals (UH), 2065 Adelbert Road, Cleveland, Ohio 44106
- Wolstein Research Building (WRB), 2103 Cornell Road, Cleveland, Ohio 44106
- Health Education Campus (HEC) Dental Clinic, 9601 Chester Avenue, Cleveland, Ohio 44106 (RGE, no RAM)
- Health Education Campus (HEC) Main Building, 9501 Euclid Avenue, Cleveland, Ohio 44106 (RGE, no RAM)

RAM and/or RGE are received and/or stored at the following sites:

- Shipping and Receiving, 2220 Circle Drive, Cleveland, Ohio 44106
- Wolstein Research Building, 2103 Cornell Road, Cleveland, Ohio 44106
- Health Education Campus (HEC) Dental Clinic, 9601 Chester Avenue, Cleveland, Ohio 44106 (RGE, no RAM)
- Health Education Campus (HEC) Main Building, 9501 Euclid Avenue, Cleveland, Ohio 44106 (RGE, no RAM)

PURPOSE FOR RAM USE

The majority of isotopes used at the University are for biomedical research. The most typical isotopes used are ^{14}C, ^{18}F, ^{3}H, ^{124}I, ^{32}P, and ^{35}S. Isotopes used in sealed sources contained within irradiators, scintillation counters, gamma counters, check sources and calibration standards are most commonly ^{137}Cs, ^{133}Ba, and ^{241}Am.

RADIATION SAFETY PROGRAM – RESPONSIBLE PARTIES

RADIATION SAFETY COMMITTEE

The RSC sets University policy for the use of RAM. The committee, whose members are appointed by the president of the University, has responsibility for monitoring and enforcing compliance with the University's Radiation Safety Program as outlined in the University's ODH broad scope license. RSC members are chosen from diverse disciplines to provide comprehensive expertise. The committee reviews all applications for the use of RAM.

The 2025-2026 RSC membership and their affiliations are listed below. The ODH is informed of committee membership changes. The committee is also aided by input from ex-officio (non-voting) and visiting members (non-voting).

VOTING MEMBERS

Dr. Thomas McCormick Dept. of Dermatology BRB 530 Term Expires: 9/1/2026 Chairperson Term Expires:9/1/2026	Felice T. Porter EHS Associate Director/RSO Quality Assurance Specialist Service Bldg., First Floor	Dr. Saba Valadkhan Dept. of Molecular Biology & Microbiology HG Wood 210A Term Expires: 9/30/2028
Dr. Colleen Croniger Dept. of Nutrition BRB 925 Term Expires: 9/30/2028	Dr. Suhrim Fisher Animal Resource Center BRB RB5P Term Expires: 9/1/2026	
Dr. Zhenghong Lee Dept. of Radiology Bolwell Building S107 Term Expires: 9/1/2026	Dr. Thomas Gerken Dept of Biochemistry Wood 477 Term Expires: 9/30/2028	

EX-OFFICIO MEMBERS

Richard Jamieson Vice President Dept. of Campus Services Administration Adelbert Hall 229	Marc Rubin EHS Senior Director Service Bldg. First Floor
Bruce DeMeza University Hospitals Asst. RSO Bishop S621	Joseph Nikstenas EHS Asst. Dir./Asst. RSO/Laser Safety Officer Service Bldg. First Floor

SUPPORT STAFF

Naomi Boles Department Assistant Service Bldg., First Floor

Dr. Thomas McCormick has served as Chair and as a voting member of Case Western Reserve University's Radiation Safety Committee (RSC), succeeding Dr. Anthony Berdis. Representing the Department of Dermatology, he leads the committee's voting members in overseeing compliance with the University's broad-scope radioactive materials license, reviewing radiation

safety protocols, and conducting periodic incident audits. In addition to his University and University Hospitals affiliations, he serves as Director of Basic Science Research in Dermatology, bringing relevant research leadership to his committee responsibilities.

Felice Thornton-Porter has held multiple leadership and oversight roles as a voting member within CWRU's Radiation Safety Committee and Radiation Safety Office. She succeeded Radiation Safety Officer W. David Sedwick, assuming responsibility as the University's primary RSO and Associate Director of Environmental Health and Safety (EHS). Previously, she served as Assistant Director, Assistant RSO, and internal auditor, while also contributing to committee documentation as report editor and departmental auditor. Her extensive experience supports continuity in radiation safety administration, regulatory compliance, and quality assurance.

Dr. Saba Valadkhan has served as a voting member of the CWRU RSC, representing the RNA Center and subsequently the Department of Molecular Biology and Microbiology. She contributes faculty expertise to the committee's review of radiation safety practices and regulatory compliance. In her academic role, she is a prominent researcher and professor whose work focuses on RNA biology and includes research into potential therapeutic approaches for HIV.

Dr. Colleen Croniger has served as a voting member of the CWRU RSC, representing the Department of Nutrition at the School of Medicine. She contributes to the review of broad-scope license protocols and actively supports compliance oversight by auditing Authorized User files to verify that radioactive material possession limits remain within authorized regulatory boundaries. Beyond her committee service, Dr. Croniger is an Associate Professor of Nutrition and Assistant Dean for Basic Science Education at the CWRU School of Medicine, bringing academic and administrative leadership to her radiation safety responsibilities.

Dr. Zhenghong Lee has served as a voting member of Case Western Reserve University's Radiation Safety Committee (RSC), representing the Department of Radiology. A Professor of Radiology and Biomedical Engineering specializing in nuclear medicine and molecular imaging, he contributes substantial expertise to the committee's regulatory oversight. His responsibilities include participating in internal audit subcommittees and reviewing Authorized User files, isotope possession limits, and radioactive waste disposal facilities to verify compliance with the University's Ohio Department of Health broad-scope radioactive materials license.

Dr. Thomas Gerken has served as a voting member of the CWRU RSC, representing the Department of Biochemistry at the School of Medicine. He actively supports the committee's regulatory oversight through routine laboratory inspections and documentation reviews. His audit responsibilities include verifying radioactive material receipt and pickup procedures, storage practices, and adherence to the conditions of the University's broad-scope license.

Dr. Suhrim Fisher has served as a voting faculty member of the CWRU RSC, representing the Animal Resource Center (ARC). As a licensed, board-certified laboratory animal veterinarian (DACLAM), she provides specialized expertise in evaluating radiation safety protocols involving radioactive materials and imaging in laboratory animal research, ensuring alignment with applicable regulatory requirements and broad-scope license conditions. She also serves as the animal expert on the University's Institutional Biosafety Committee (IBC), contributing to broader oversight of animal-related research protocols and institutional compliance.

Joseph Nikstenas has served as an ex-officio member of Case Western Reserve University's Radiation Safety Committee (RSC), providing technical expertise and leadership in radiation

and laser safety. Initially serving as a Safety Specialist and the University's Laser Safety Officer (LSO), his responsibilities expanded to include chemical safety, leading to his current roles as Assistant Director of Radiation Safety and Assistant Radiation Safety Officer (ARSO). His committee contributions include presenting the annual Laser Safety Summary and coordinating laboratory compliance audits to verify adherence to the conditions of CWRU's State of Ohio Broad Scope License.

Bruce DeMeza has served as an ex-officio member of the CWRU RSC, representing University Hospitals (UH) in his capacity as Assistant Radiation Safety Officer. Given the integrated research facilities and shared medical campus of CWRU and UH, his role is essential to maintaining coordination between the institutions' radiation safety programs. He serves as a key liaison between CWRU's Radiation Safety Office and UH's clinical research departments, facilitating regulatory compliance, personnel updates, and alignment of joint safety protocols.

Naomi Boles serves as the primary administrative support staff member for the CWRU RSC through her role as Department Assistant II within Environmental Health and Safety (EHS). Although she is not a voting or ex-officio committee member, she provides essential operational and administrative support to ensure effective committee functioning. Her responsibilities include managing committee documentation, maintaining records, and coordinating communications, supporting continuity, organization, and efficient administration of the RSC's activities.

The RSC acts as an advisory and enforcement body to ensure that all RAM is safely used in accordance with the 'As Low As Reasonably Achievable' (ALARA) principle. The committee conducts audits each trimester, addressing programmatic compliance. The RSC also conducts an annual audit in which the entire program is reviewed.

The audits ensure that:

- Specific program components conform to the licensed program as described in the CWRU Radiation Safety Manual and License
- Accurate documentation for program conformance and license compliance is maintained.
- Adequate training is provided for all classes of workers.
- Oversight for RSOF activities is maintained through RSC familiarity with the daily function of the University radiation safety program.

The RSC met via Zoom and in person on four occasions during the 2025-2026 fiscal year to review applications for radioisotope use and act on other business. All meeting achieved a quorum. Four RSC meetings were canceled because agenda items did not require immediate attention. The minutes of the RSC meetings and executive committee actions are available in the RSOF, through the RSC or through the University's administration. The presence of radioactive materials and use of irradiators required continuing audit activities over this period by both the RSOF staff and the RSC members.

APPLICATIONS	25/ 26	24/ 25	23/ 24	22/ 23	21/ 22	20/ 21	19/ 20	18/ 19	17/ 18	16/ 17	15/ 16	14/ 15
New AU	0	0	1	1	1	1	0	2	3	3	1	3
Additional Isotopes	2	2	3	1	2	3	2	1	2	0	2	2
Radioisotope use in Animals	2	2	1	1	1	1	1	0	2	2	4	1
Sealed Sources	0	3	0	1	2	3	0	0	1	5	0	6
Sealed Sources Update	1	2	1	0	1	1	2	2	1	0	0	0

AU Reactivation	0	0	0	0	0	0	0	0	0	0	0	0
Possession Limit Increase	0	0	0	0	0	0	0	0	0	0	0	2
AU Protocol Update	1	3	8	3	5	4	3	16	4	7	2	7
TOTAL APPROVALS	6	12	14	7	12	13	8	21	13	17	9	21

Important topics acted upon or discussed by the RSC:

- ISEB move-in scheduled for October–November (4/2026).
- President's walkthrough identified 85 spaces for reallocation to new PIs (4/2026).
- Last Radiation Safety Committee (RSC) meeting was held on December 17, 2025. (4/2026)
- Dr. Christine Duval's application corrections completed in March 2026. (4/2026)
- Summer dry runs required before experiments. (4/2026)
- January 2026 audits completed successfully. (4/2026)
- April 2026 quarterly audits underway. (4/2026)
- NOCHPS meeting scheduled for April 2026. (4/2026)
- X-ray irradiator arrival date remains undetermined. (4/2026)
- Raymond Muzic retiring May 31, 2026. (4/2026)
- Emergency tabletop meeting with Marc Rubin and Felice Porter was held on March 10, 2026. (4/2026)
- School of Medicine lab cleanouts planned for Fall 2026. (4/2026)
- Annual irradiator training conducted by the RSOF in February 2026. (4/2026)
- One license now covers X-ray units on the bus and main campus. (4/2026)
- Dorsett at Think Box remains in the planning stage. (4/2026)
- Moffitt's planned cadaver work has been canceled. (4/2026)
- X-ray irradiator installation requires onsite assembly and structural engineering review due to its increased weight (1,000 pounds over the previous unit); the company will cover the engineering cost. (12/2025)
- Annual report submitted to the CWRU President and RSC Chair Tom McCormick; ODH inspection went well. (12/2025)
- ISEB project progressing well. (12/2025)
- RSC Chair thanked committee members for completing the RSC audits. (12/2025)
- New X-ray irradiator assembly underway; delivery postponed to October 2025, with primary tube installation planned for late March 2026. Structural analysis confirmed the transport route and installation room are safe. (10/2025)
- Quarterly dosimeter readings were below background levels; no fetal monitors reported. (10/2025)
- RSC members to revise the 2024–2025 Annual Report draft before submission to the CWRU President. (10/2025)
- New CWRU IRB protocol includes the use of pulsed lasers (Erin Zaletel). (10/2025)
- W. John Durfee plans to retire as ARC Director in January 2026 after 26 years at CWRU. (10/2025)
- Saba Valadkhan is recognized for research featured in an October 2, 2025, article on potential HIV cures. (10/2025)
- RSC audits underway in October 2025. (10/2025)
- RSC members thanked the Radiation Safety staff for their hard work and contributions. (10/2025)
- Fall Break scheduled for October 20–21, 2025. (10/2025)

- Moffitt Laser Laboratory using lasers on cadavers to measure tissue depth; RSOF to follow up with UH RSO and Dental Clinic regarding dental laser use. (9/2025)
- New X-ray irradiator delivery postponed to October 2025; primary tube installation planned for March 2026. Structural analysis confirmed safe transport and installation. (9/2025)
- New Wu SAIRC Medea X-ray unit, received in April 2025, is operational for ^{18}F-FDG and ^{99m}Tc. (9/2025)
- Quarterly dosimeter readings below background; no fetal monitors reported. (9/2025)
- 2024–2025 RSC Annual Report in progress. (9/2025)
- Pulsed laser use included in new CWRU IRB protocol (Erin Zaletel). (9/2025)
- Think Box preliminary planning underway for a fiber laser cutter/engraver (Claire Dorsett). (9/2025)
- New laboratory space not previously authorized for RAM is planned for work with NORM. (9/2025)
- RSC member appointments updated: Valadkhan, Croniger, and Gerken through September 2028. (9/2025)
- RAM application renewal due for Gott in March 2026. (9/2025)
- Next RSC meeting scheduled for October 2025 to review the annual report. (9/2025)
- W. John Durfee (ARC) plans to retire in January 2026 after 24 years of service. (9/2025)
- ISEB building construction is progressing well. (9/2025)
- Fiscal Year 2025–2026 trimester RSC audits scheduled for October 2025. (9/2025)

SENIOR MANAGEMENT

The Radiation Safety Program monitors, inspects and audits RGE and sources used by AUs and their personnel. Senior management oversight and support of radiation safety-related activities are guaranteed by attendance of the vice president for campus services, or an appointed representative, at all RSC meetings. The RSC conducts independent audits of the Radiation Safety Program. The RSOF staff immediately responds to audit findings. Audit findings and responses are reported to senior management and the Committee. Richard Jamieson, vice president for campus services, continues to provide direct administrative representation for the Radiation Safety Program.

Richard Jamieson has a longstanding history of service on Case Western Reserve University's safety and administrative committees and serves as an ex-officio member of the Radiation Safety Committee (RSC). His involvement reflects his tenure as Vice President for Campus Services, during which he provided senior-level oversight and administrative representation for the university's radiation safety compliance and auditing programs. Beginning his CWRU career as a campus security officer and investigator, he advanced through successive leadership roles before assuming his current executive position.

In Richard Jamieson's absence, Marc Rubin, Executive Director of Environmental Health and Safety (EHS), provides administrative representation as an ex-officio member to the RSC. Marc has formally served as an alternate administrative representative and brings extensive institutional experience in safety and regulatory compliance. He joined CWRU EHS as a Senior Director before advancing to Executive Director, providing continuity in administrative oversight and support for the University's environmental health and safety programs.

RSOF AND AUTHORIZED USERS (AUs)

AUs and the RSOF share responsibility for radiation safety and regulatory compliance. AUs are accountable for the safe use of RAM in their laboratories and for ensuring appropriate safety oversight during experiments. The RSOF provides institutional oversight by verifying implementation of required safety procedures and conducting routine, unannounced laboratory audits to ensure compliance with CWRU's radioactive materials license.

ADMINISTRATIVE CONTROLS

The Radiation Safety Committee (RSC) establishes and approves administrative controls for laboratories using radioactive materials (RAM), including signage, training, access controls, and dosimetry. Documented procedures govern the procurement, use, and disposal of RAM to ensure consistent oversight and regulatory compliance.

The University's radiation safety enforcement program establishes sanctions for noncompliance that could compromise safety or jeopardize the University's regulatory standing with the Ohio Department of Health (ODH). The program promotes accountability and cooperation among RAM users and ensures practices align with applicable ODH regulations, as interpreted by the RSC and the Radiation Safety Office (RSOF).

There are three classes of violations, defined as minor, moderate, and major severity.

Minor severity violations are listed under the following categories:

- Improper laboratory records
- Noncompliant RAM use and storage
- Maintenance of an unsafe laboratory environment

Moderate severity violations include the following:

- Food/cosmetics in laboratory
- RAM unsecured
- RAM in unauthorized areas
- Unapproved radiation laboratories
- Unapproved disposal of radioactive materials
- Unidentified contamination
- Failure to respond to written notices from the RSOF

Major severity violations include the following:

- Falsification of records
- Unreported loss or theft of RAM
- Unapproved transfer of RAM

No major severity violations were identified during the reporting year. All three moderate violations listed below resulted from unsecured radioactive materials (RAM) identified during after-hours security checks and routine compliance reviews. No laboratory received a moderate violation associated with three or more minor violations during routine radiation safety audits. All moderate violations were documented, with follow-up and corrective actions completed.

VIOLATIONS	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Minor	10	33	36	16	31	24	19	38	43	70	78	81
Moderate	3	0	8	6	3	7	2	17	13	11	10	13
Major	0	0	0	0	0	0	0	0	0	0	0	0
Total	13	33	44	22	34	31	21	55	56	81	88	94

The Assistant RSO, RSOF staff, and RSO updated and revised most departmental manuals, training materials, licenses, certificates, and standard operating procedures during the 2025–2026 reporting period.

AU CATEGORIES:

RADIATION ACTIVE (RA)

AUs who actively use RAM are "radiation active." Laboratories of these AUs are inspected by the RSOF three times per year. Audits are more frequent if there are concerns in a laboratory. A listing of AUs and their RAM can be found in the APPENDIX.

RADIATION INACTIVE (RI)

These AUs do not currently use or possess RAM.

RADIATION ACTIVE STORAGE MODE (SM)

AUs who did not actively use RAM, but who wish to maintain their RAM inventory will, by their request, have their inventory placed in storage mode status this fiscal year.

DEPARTED (D)

AUs, who no longer carry out research at CWRU, and whose laboratories have been decommissioned for RAM use, have been placed in the departed category this fiscal year.

AUs	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
RA	23	26	28	29	32	35	44	47	49	50	54	62
SM	8	10	10	12	16	18	16	18	20	15	20	8
RI	1	2	2	4	5	5	2	2	7	5	5	3
D	0	0	0	3	1	1	2	3	5	5	2	6
Total in Program	32	36	38	41	48	53	64	70	69	65	74	70

MASTER ISOTOPE LIST

The master isotope list (see APPENDIX) shows the University's isotope inventory; the sum of the AUs' inventory (excluding sealed sources) and the sum of the AUs' possession limits relative to the Nuclear Regulatory Commission/ODH license limit.

AU RADIOISOTOPE INVENTORY

The radioisotope inventory report (see APPENDIX) lists researchers, along with their RAM status.

RADIATION SAFETY OFFICE (RSOF)

STAFFING

The RSOF operated under University approval with the following positions:

Associate Director/RSO/Quality Assurance Specialist (1)
Asst. Director/Asst. RSO (1)
Student (1)
Specialist positions (3)
Department Assistant (2)

Training and professional development are essential to maintaining staff competency, supporting effective incident response, and ensuring regulatory compliance. During the 2025–2026 reporting period, EHS personnel participated in in-person and virtual training, seminars, and conferences covering radiological instrumentation, RCRA hazardous waste management, 8-hour HAZWOPER refresher training, and DOT/IATA Class 7 radioactive materials transportation security awareness. Staff are encouraged to pursue continuing education to strengthen technical expertise and operational readiness.

EHS staff maintain the departmental website as a central resource for the campus community, providing online training programs and schedules, safety manuals, newsletters, safety data sheets, and other safety resources. Ongoing updates ensure the information remains accurate and accessible. Staff also maintain and back up departmental databases to support data integrity, continuity, and reliable operations.

EHS EMAIL

Since implementing the EHS email channels (cwruehs@gmail.com and cwruehs@case.edu) and website (case.edu/ehs), EHS has received an average of 25 emails per day from CWRU personnel reporting inquiries and safety concerns. These communication channels support timely responses, effective follow-up, and prompt resolution of concerns raised by the campus community.

Employees may report suspected unethical activity anonymously through the Case Western Reserve University Integrity Hotline at 866.483.9367 or caseintegrityhotline.com. Reporters are encouraged to provide the date, time, location, and other relevant details to support appropriate review and follow-up.

TRAINING SESSIONS

The Radiation Safety Committee (RSC) ensures that personnel using radioactive materials (RAM) are adequately trained to minimize occupational radiation exposure and environmental releases in accordance with the ALARA (As Low As Reasonably Achievable) principle. The Radiation Safety Office (RSOF) provides training for all personnel working with RAM or radiation-generating equipment (RGE), including X-ray equipment. Initial training is required before use, with annual refresher training mandated for continued RAM use and for ancillary workers who have occasional contact with RAM. Personnel receiving training include:

AU

An AU is a faculty member who has been approved by the RSC to use RAM.

RADIATION WORKER

A radiation worker is any person who uses RAM under the supervision of an AU.

ANCILLARY WORKER

Ancillary workers are non-radiation personnel who may access laboratories or classrooms where radioactive materials (RAM) are used. This group includes Facilities Services, Protective Services, in-house and contract custodial staff, Shipping and Receiving, the Animal Resource Center (ARC), and research department assistants. As part of orientation, these personnel must complete training that includes radiation safety fundamentals relevant to their roles.

RADIATION GENERATING EQUIPMENT (RGE) WORKER

An X-ray worker is any individual who uses radiation-generating equipment (RGE) as part of an Authorized User's (AU's) research program. X-ray safety training is mandatory for all users of X-ray diffraction equipment, as well as veterinary X-ray and fluoroscopy systems.

LASER WORKER

A laser worker is any individual who uses Class 3B or Class 4 laser equipment as part of an Authorized User's (AU's) research program. Laser safety training is mandatory for all users of these laser classes before use and must be renewed every two years thereafter.

IRRADIATOR USERS

Personnel using irradiators are required to attend initial radiation safety training conducted by the RSOF and site-specific training with the manager of the irradiator. An irradiator worker is any person who has met the requirements for unescorted room access, including background and fingerprint checks, radiation safety, and site-specific laboratory safety training.

TRAINING

The RSOF maintains comprehensive training records, including dates, attendance, course content, and online refresher training, to support CWRU's safety culture and regulatory compliance. The RSO conducts monthly training audits, supported by program documentation and relevant safety materials, while the RSOF oversees on-site irradiator training. Annual irradiator training was completed in February 2026 for 98 Public Safety, irradiator, and RSOF personnel.

The RSOF provides new isotope-user training at least twice monthly, annual online radiation safety refresher training, and monthly X-ray safety classes. Authorized Users (AUs) are responsible for annual machine- and performance-specific refresher training for personnel operating X-ray equipment in their laboratories. Fluoroscopy users must complete general X-ray, site-specific, and fluoroscopy-specific training, while Right-to-Know training is available to individuals observing fluoroscopy procedures. Monthly training is also provided for Class 3B and Class 4 laser users, with mandatory online refresher training every two years.

Non-laboratory personnel must complete Hazard Communication and ancillary radiation safety training, including staff from custodial, plant operations, the Animal Resource Center (ARC), shipping, security, and contracted services. Personnel who fail to complete required training are prohibited from working in areas where radioactive materials (RAM) are used. Since July 2024, the Health Education Campus (HEC) Safety Training program has enabled eligible clinical faculty, staff, and students in Medicine, Dentistry, Nursing, and Physician Assistant programs with CWRU Google accounts to satisfy requirements through a combined initial and annual Canvas course covering laboratory safety, biosafety, Hazard Communication, and ancillary radiation safety. Ancillary training fell from 1,504 (24/25) to 365 (25/26) because ancillary training is now captured inside the integrated Canvas modules (see accomplishments, page 3). The table below summarizes personnel training over the past decade.

TRAINING	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Radiation	46	62	74	91	70	69	108	143	133	118	61	92
Online Retraining	169	168	197	208	217	258	298	398	342	349	563	615
X-ray	28	32	41	10	7	15	12	32	22	43	58	50
Ancillary	365	1504	486	865	1764	1651	725	1561	710	741	619	279
Laser	60	64	48	55	71	30	58	66	59	40	46	41
Laser Online	84	61	65	51	62	42	48	40	68	22	67	27

A total of 752 laboratory workers were trained through the Radiation Safety Program in 2025-2026.

FACILITIES AND EQUIPMENT

CWRU administration and the Radiation Safety Committee (RSC) ensure that appropriate facilities, equipment, and qualified personnel are available for the safe use, storage, and disposal of licensed radioactive materials. The Radiation Safety Officer (RSO) and Assistant RSO oversee application reviews and inspections of facilities, equipment, and personnel involved in licensed material activities to ensure compliance with regulatory requirements. Facilities available at CWRU for the use of licensed materials include:

AW Smith	Bingham	Biomedical Research	Bishop
Bolwell	DeGrace	Glennan	HEC Dental
HEC Main	HG Wood	Kent Hale Smith	Lerner Tower
Med East/Robbins	Millis	Olin	Pathology
Research Tower	Rockefeller	Service	Wearn
West Quad (CCSB)	White	Wickenden	Wolstein Research
Startup Incubator (formerly BioEnterprise)			

LABORATORIES

CWRU has 211 campus spaces authorized for the use of licensed radioactive materials and equipment. These laboratories are typically equipped with chemical fume hoods, radiation survey meters, personal protective equipment, analytical detection and measurement instruments, radioactive waste receptacles, and decontamination supplies to support safe operations and regulatory compliance.

LABORATORY USE	# OF ROOMS
Radiation	60
X-ray	69
Laser	82

Radiation Safety Office (RSOF):

The RSOF maintains facilities and equipment supporting laboratory inspections and isotope storage at the Service Building (first floor), School of Medicine (DOA 990), and Wolstein Building (rooms 1118, 1119, and 1120).

RSOF Laboratory:

The RSOF laboratory, located on the first floor of the Service Building at 2220 Circle Drive, houses specialized instrumentation and equipment supporting radiation safety, bioassay analysis, and regulatory compliance. Key resources include PerkinElmer Tri-Carb 4910 liquid scintillation and 2470 (Wallac Wizard 2) gamma counters, a Packard Cobra II Auto Gamma counter, a single-channel analyzer for iodine-125 thyroid uptake monitoring, and a multichannel analyzer with a sodium iodide detector. These instruments support bioassay testing, air-sample analysis for EPA audits, and identification of unknown isotopes during radiation inspections. The laboratory is also equipped with a chemical fume hood, radiation survey meters, an upgraded USB-enabled multichannel analyzer with dedicated software and computer, decontamination supplies, and essential analytical and calibration equipment. Additional liquid scintillation counters are maintained at both radioactive waste facilities.

Radioactive Waste Facilities:

Medical School Waste Facility (DOA 990):

The radioactive waste facility includes a dedicated office and a process and storage area for radioactive material handling and waste management. The facility operates under negative pressure with filtered exhaust and is equipped with a waste compactor and shredder, chemical and walk-in hoods, radiation survey meters, air-monitoring instruments, and emergency response equipment to support safe operations and regulatory compliance.

The storage area is organized with designated racks and containment systems for dry solid waste, bulk liquid waste, and liquid scintillation vials. Solid waste and scintillation vials are packaged in standard 55-gallon drums, while liquid waste is stored in five-gallon carboys secured in spill trays. Facility improvements included floor repairs and resurfacing in February 2016, removal of more than half of unused storage racks in 2017, and disposal of obsolete, damaged, and unwanted equipment and materials. Radioactive animal carcasses are temporarily stored in a designated freezer at the Animal Resource Center (ARC) pending removal.

Wolstein Building Waste Facility:

The Wolstein Building facility is organized to support radiation safety and radioactive waste management. Room 1120 serves as the counting room and contains a chemical hood, while Room 1119 houses a walk-in chemical hood and liquid processing and storage area. Room 1118 is dedicated to solid waste processing and storage. Both liquid and solid waste areas are designated for short-term storage only.

Room 1120 also serves as a combined chemical and radioactive materials (RAM) emergency response center. It is equipped with a liquid scintillation counter and a computer providing access to the OnSite web database and safety data sheets, supporting timely information retrieval and response during radioactive material or chemical spill incidents.

IODINATION EQUIPMENT

Specialized hoods, air pumps, and activated-charcoal exhaust filtration systems support safe iodination procedures in designated laboratories. Five iodination hoods are currently in storage: one hood with a fan and pump at the WRB 1119 Radiation Waste Facility, three hoods with fans and pumps plus one spare fan unit at DOA 990, and one hood with a fan and pump at Bishop S629C.

ANIMAL RESOURCE CENTERS

Conventional animal research facilities are located in the Robbins, Wearn, Wickenden, MetroHealth Hospital, Small Animal Imaging Research Center (SAIRC), and Wolstein Research Building (WRB). These facilities support Authorized Users (AUs) conducting animal studies involving radioactive, chemical, and biological materials. Species housed include mice, rats, hamsters, rabbits, groundhogs, ferrets, sheep, dogs, and pigs, as needed. Wearn, Wickenden, and Wolstein primarily house mice and rats; however, animals involved in radioactive material studies are not housed at Wolstein. Contaminated items are stored in the Robbins Animal Resource Center (ARC) freezer pending disposal. The inactive cesium-137 (137Cs) irradiator formerly located behind the Robbins ultra-barrier was decommissioned and removed by the U.S. Department of Energy on November 2, 2023.

EQUIPMENT CALIBRATION

Annual radiation survey instrument calibration includes electronic performance assessments and verification using calibrated isotope reference standards. Instruments requiring dose-rate calibration or repairs beyond the RSOF's capabilities are sent to qualified vendors through the respective AUs' laboratories, while minor repairs are completed in-house. The Packard Cobra II auto gamma counter and PerkinElmer Tri-Carb 4910 liquid scintillation counter (LSC) are housed in the Service Building radiation laboratory; the former LSC has been relocated to the WRB laboratory.

Monthly quality control checks are conducted on EHS liquid scintillation and gamma counters located in the radiation laboratory, and WRB 1119. The continuous air monitor in DOA 990 and all iodination air pumps remain out of service pending future need; annually calibrated airflow meters support pump calibration when required. The LSCs in the radiation safety laboratory and WRB 1120 are maintained under service contracts. During the reporting period, 36 monthly LSC quality control checks were completed, and 10 LSCs are currently maintained across campus.

RADIATION SAFETY PROGRAM

RADIOACTIVE MATERIALS RECEIVED & DISPOSED

PURCHASE OF RADIOACTIVE MATERIALS

Authorized Users (AUs) and their approved designees may purchase radioactive materials only with prior RSOF approval. Each order must fall within the AU's approved isotope and quantity limits, ensuring the combined activity does not exceed the authorized possession limit. Replacement shipments, trial kits, and complimentary samples are subject to the same approval requirements. All deliveries must be routed through Shipping and Receiving for RSOF inspection and clearance before release to the AU's laboratory.

ISOTOPE	ORDERS		TRANSFERS	
	#	mCi	#	mCi
^{211}At	1	5	0	0
^{14}C	1	0.047	0	0
^{64}Cu	2	60	4	28
^{18}F	0	0	13	123
^{68}Ga	0	0	2	30
^{124}I	1	2	0	0
^{177}Lu	2	18	1	14
^{32}P	7	46.45	0	0
^{35}S	1	2.29	0	0
^{99m}Tc	0	0	7	52
Total	15	133.79	27	247

TRANSFER OF RADIOACTIVE MATERIALS

The RSOF reviews and approves all internal (on-campus) and external (off-campus) transfers of radioactive materials (RAM) to or from Authorized Users (AUs). A completed internal or external transfer form must be submitted to the RSOF for approval before any transfer occurs. During the reporting year, 27 isotope transfers were approved.

RECEIPT OF RADIOACTIVE MATERIALS

The RSOF inspects all incoming radioactive material (RAM) packages for contamination, radiation dose rates, damage, and breakage. Packages exceeding established limits—10 mR/hr at one meter or 200 mR/hr at the surface—or showing contamination are held pending laboratory notification and resolution. Inspected packages receive an inspection sticker and RAM receipt form before delivery by campus mail or direct pickup by laboratory designees. Upon receipt, the Authorized User (AU) or designee must survey each package for contamination and evidence of damage or breakage. Direct pickup is used for laboratories across Adelbert Road or Cornell Road, eliminating the need for a vehicle transport bill of lading when packages are carried directly to the laboratory.

The University's broad-scope radioactive materials license requires incoming shipments to be surveyed within three hours of arrival. During the reporting year, the RSOF inspected and approved 15 incoming radioisotope shipments. Increased use of short-lived radiopharmaceuticals, including Fluorine-18 (18F), for advanced nuclear medicine diagnostics and targeted radiopharmaceutical therapy has necessitated specialized transfer procedures to address rapid radioactive decay and regulatory requirements. The RSOF also coordinated several off-campus Department of Transportation (DOT) shipments and transfers, ensuring appropriate documentation and package labeling.

DISPOSAL OF RADIOACTIVE MATERIALS

Excluding radioactive decay and minor inventory adjustments, radioactive materials were removed from laboratories through 29 RSOF-managed radioactive waste pickups and seven AU-directed disposals via the sanitary sewer system. The following table summarizes radioactive material movements into and out of CWRU laboratories over the past 12 fiscal years.

RADIOACTIVE MATERIALS	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Orders	15	27	28	35	32	43	86	131	137	164	193	241
mCi	133.79	17,178.38	182	1381	97.97	206	335	444	363	383	578	732
Pickups	29	41	53	73	31	53	100	106	44	176	306	250
Sewer Disposals	7	7	8	5	15	14	35	37	21	53	69	50
Transfers	27	58	64	85	53	27	63	110	85	123	77	61
mCi	247	351.58	473	1415	299.4	220	471	227	641	462	173	814

SEALED SOURCES

CWRU's sealed-source inventory includes 69 sealed sources, of which 64 require semiannual inventory verification and five require semiannual leak testing in accordance with the University's Ohio Department of Health (ODH) license. The five sources subject to leak testing are gamma sources.

CWRU maintains two active, high-dose irradiators, which represent the primary potential sources of significant external radiation exposure if their shielding is compromised. A complete listing of sealed sources currently housed on campus is provided in the Appendix; these sources are excluded from the general radioactive materials inventory summary reports.

INVENTORY	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Sealed Sources	69	70	75	75	77	78	84	82	86	94	93	93
Exempt	64	64	69	71	73	73	78	76	79	89	88	88
Irradiator	2	2	2	3	3	3	3	3	3	3	3	3
Neutron	0	0	0	0	0	0	0	0	1	1	1	1

IRRADIATORS

CWRU maintains two licensed high-dose irradiators containing cesium-137 (137Cs) sources to support biomedical and other research activities. During the reporting year, 32 personnel were

authorized to use these irradiators. The following table summarizes the number of authorized individual irradiator users.

IRRADIATOR	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Total Workers	32	41	34	31	22	22	19	20	26	34	30	38
Total Active Irradiators	2	2	2	2	2	2	2	2	2	2	2	2

RADIATION SURVEY METER CALIBRATIONS

CWRU's Ohio Department of Health (ODH) Broad Scope license requires annual calibration of portable radiation survey meters to ensure accurate laboratory radiation monitoring. Authorized Users (AUs) are responsible for the annual calibration, maintenance, and repair of their instruments, while the RSOF provides count-rate calibration and minor repairs at no cost. Although RadEye meter servicing and pump and filter replacements were performed externally, EHS in-house services generated an estimated $13,930 in cost savings during the fiscal year by reducing reliance on outside vendors.

CALIBRATION/ SERVICE	COST PER SERVICE	COST SAVINGS
59 meters	$200/meter	**$11,800 (EHS)**
11 Rad Eye meters	$200/meter	$1,375 (vendor)
1 pump	$355/pump	$355 (vendor)
0 thyroid assays	$100/assay	**$0 (EHS)**
4 pre-filter changes	$100/ set of 4/quarterly	$400 (vendor)
	TOTAL COST	**$13,930**

During the last fiscal year, 70 radiation survey meters (59 in-house and 11 RadEye units by the vendor) were calibrated, and no meters were removed from service. The RSOF maintains calibration certificates for all active University meters, including instrument efficiency data for isotopes used in laboratories. Facilities Services now manages the 90-day replacement schedule for DOA pre-filters. The walk-in hood fan units remain unchanged because they operate only when the hood is in use. The DOA radiation area contains two double-unit HEPA filtration systems for the walk-in hoods and two single-unit systems serving the chemical hood and decay area above the DOA office. The compactor fan has been repaired, and two pre-filters and two HEPA filters are routinely replaced across the two designated units.

The Bioassay Program has remained inactive since 2021. No iodination procedures were performed, and no iodination hood pumps were calibrated during the reporting period; consequently, no thyroid bioassays were required. The continuous air monitoring (CAM) system remains out of service and has not been calibrated.

CALIBRATION/ SERVICE	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Meter Calibration	59	59	78	70	75	81	73	88	95	91	115	112

METERS IN USE	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Hi-Q	1	1	1	1	1	1	1	1	1	2	2	1
Inovision	0	0	0	2	2	0	1	1	1	2	1	1
Ludlum	36	37	45	45	50	52	45	58	63	61	81	87
RPI Mini Monitor	3	3	3	3	4	4	2	4	6	10	13	8
Technical	0	0	0	0	0	1	1	1	1	1	1	1
Victoreen	2	1	1	3	0	4	2	3	2	4	6	4

WB Johnson	6	5	5	5	6	7	6	6	6	7	10	10
Fluke Biomedical	0	0	0	0	0	0	1	1	1	1	1	1
Research Product	1	1	1	1	1	1	2	1	1	1	1	1
Rad Eye	10	11	12	12	12	11	12	12	12	2	2	0

METER CALIBRATION BY MONTH	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
7/2025	5	8	11	10	12	16	10	13	24	12	18	17
8/2025	0	1	1	6	4	17	20	17	12	8	12	10
9/2025	7	4	5	5	25	13	9	15	9	7	8	6
10/2025	12	17	21	26	14	11	10	2	4	5	7	6
11/2025	17	10	15	6	4	3	0	5	4	4	6	1
12/2025	3	5	4	4	2	8	10	5	6	8	8	12
1/2026	6	3	3	1	2	5	1	0	1	0	7	9
2/2026	3	6	5	5	8	5	5	8	0	0	12	15
3/2026	2	1	1	4	2	1	1	1	23	8	10	13
4/2026	3	2	3	1	1	2	2	13	4	17	8	10
5/2026	0	1	2	5	0	1	2	8	7	9	7	12
6/2026	1	1	7	1	1	1	2	1	1	7	12	1

RAM SECURITY

Radioactive materials (RAM) and potentially hazardous chemicals must be secured against unauthorized access or removal whenever unattended. Refrigerators, freezers, and other storage units in unsecured areas must have locks or secured, labeled lockboxes, with isotope inventory access restricted when authorized personnel are absent. The RSOF conducts monthly after-hours security inspections across all campus buildings to verify compliance. During the reporting period, three security violations (unsecured RAM classified as moderate) were identified; affected Authorized Users (AUs) were notified, corrective actions were recommended, and remediation was verified during subsequent inspections.

RAM SECURITY CHECKS	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Violations	3	0	7	6	3	7	2	15	10	10	7	13

PERSONNEL MONITORING

The RSOF administers the personal radiation dosimetry program for radiation workers and other individuals who may receive measurable occupational radiation exposure at CWRU. Eligible personnel include laboratory workers, visitors, maintenance staff, and contractors, with dosimeters available upon request. Individuals issued dosimeters must complete initial radiation worker training and an occupational exposure history form. Dosimeters and area monitors must be returned promptly at the end of each monitoring cycle to enable timely review and response to elevated exposures in accordance with the ALARA principle. The Ohio Department of Health (ODH) is notified when regulatory exposure limits are exceeded.

CWRU renewed its radiation monitoring services contract with Landauer, Inc., extending the agreement through June 2027.

PREGNANT WORKER PROGRAM

Radiation workers who are or believe they may be pregnant are encouraged to submit a Declaration of Pregnancy form, available through the Radiation Safety section of the EHS website, to the RSOF. The RSOF provides counseling and issues an additional fetal dosimeter, monitored monthly, to conservatively assess potential radiation exposure to the developing fetus. No pregnancy declarations were submitted during the reporting period.

NEUTRON USERS

Personnel conducting experiments or procedures involving neutron sources must wear neutron-sensitive dosimeters, available through the RSOF, to monitor potential exposure. During the fiscal year, two neutron dosimeters were used in the Surgical Training and Research Laboratory (STAR).

USERS OF RGE/ X-RAY

The RSOF provides specialized dosimeters for personnel working with radiation-generating equipment (RGE), including fluoroscopy systems and X-ray diffractometers. During the reporting year, all four fluoroscopy users were issued collar badges. Since 2019, individual dosimetry for fluoroscopy observers has been replaced by area monitoring at the STAR Facility.

Although only 20% of currently monitored personnel are required to wear dosimeters under CWRU's broad-scope radioactive materials license or RGE programs, the RSOF encourages voluntary participation. Personal dosimetry supports early detection of potentially elevated radiation exposures and strengthens occupational radiation safety.

PERSONNEL MONITORING	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Pregnant Workers	0	1	0	0	1	0	1	1	1	0	0	0
Neutron	2	2	2	2	2	2	2	2	2	2	2	2
RGE/ X-ray	55	35	32	25	25	25	175	76	251	32	25	37
Dental	51	25	35	47	47	51	38	35	41	27	37	28
General	224	274	347	340	342	399	325	284	347	485	460	473

CWRU uses Luxel dosimeters, which provide high-sensitivity personnel radiation monitoring with a minimum detectable dose of 1.0 mrem. In accordance with Ohio Department of Health (ODH) requirements, all monitored workers must be informed annually of their occupational radiation exposure. During the 2025-2026 fiscal reporting year, all monitored personnel received copies of their individual dose reports for the preceding calendar year.

RADIATION GENERATING EQUIPMENT

Radiation-generating equipment (RGE) must display appropriate warning labels and indicators, undergo operational radiation leakage testing, and remain secured against unauthorized use except under direct operator supervision. CWRU's RGE inventory includes analytical research equipment, such as X-ray diffraction units, and equipment used for healthcare and diagnostic

research. Electron microscopes have been exempted from X-ray registration requirements since August 2015. Currently, seven Authorized Users (AUs) oversee RGE in 69 laboratories. Equipment is inventoried semiannually and surveyed annually for radiation leakage. Investigators are responsible for providing site-specific operator training, while EHS provides general RGE safety training.

RADIATION-GENERATING UNITS	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Diagnostic units Disposed	0	0	2	0	0	25	0	0	0	0	2	0
Diagnostic units Purchased	0	0	2	0	0	0	0	0	0	0	1	3

The Ohio Department of Health (ODH) revised the classification of CWRU's radiation-generating equipment, resulting in one unit being declassified as an X-ray unit and removed from the University's license during an ODH inspection. During the 2025–2026 reporting period, no new units were purchased, none were removed from service, and none were disposed of. The table below reflects the classification change and updated equipment inventory.

RADIATION GENERATING EQUIPMENT (IN USE)	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Closed Beam Analytical	6	6	5	5	5	5	5	6	6	6	6	6
Dental Computer Tomography (CT)	1	2	2	2	2	2	5	5	2	2	2	1
Fluoroscopy	1	1	1	1	1	1	2	2	2	2	2	3
Handheld non-medical	1	1	1									
Hand-held Dental	6	6	8	8	8	8	8	13	4	3	2	3
Hand-held Dental (Inoperable)	9	4	6	1	1	1	1	1	0	1	1	0
Intraoral	42	44	46	55	55	55	73	72	30	30	28	27
Intraoral (Inoperable)	8	4	2									
Panoral (Only)	1	1	1	1	1	1	1	1	1	1	1	1
Cabinet System exclude admittance	1	3	3	2	2	2	3	3	3	3	3	3
Cabinet System exclude Admittance (In-Op)	2	2	2									
Tube Only (Inoperable)	1	1	1	11	11	11	9	0	0	9	9	12
Vet CT	1											
TOTAL TUBES	**80**	**75**	**78**	**87**	**87**	**87**	**112**	**103**	**49**	**71**	**71**	**74**

RADIOACTIVE MATERIAL RELEASES

SEWER EXPOSURE CONTROL and MONITORING

Although the Northeast Ohio Regional Sewer District (NEORSD) no longer requires annual reporting, state and federal regulations permit CWRU to discharge eligible low-level radioactive materials (RAM) into the sanitary sewer system within established limits. The RSOF requires semiannual reports from applicable Authorized Users (AUs) and confirmed that all sewer discharges complied with state and federal requirements during both reporting periods: July–December 2025 and January–June 2026. Eight AUs operating in storage mode or using only sealed sources were exempt from reporting. CWRU achieved 100% compliance with applicable sewer disposal requirements for both periods.

AIR EXPOSURE CONTROL & MONITORING

During the reporting period, CWRU's airborne radioactive material releases remained below 10% of EPA-established limits, requiring no air-emissions reports and maintaining compliance with applicable EPA Clean Air Act, NRC, and ODH requirements. To control airborne exposure, particularly from volatile radioactive iodine used in protein iodination, the RSOF requires designated iodination hoods with charcoal-filtered exhaust, which typically reduce emissions by approximately 90%, and closed systems for procedures involving large quantities of highly volatile iodine. The iodination program has remained inactive since 2021, and no experiments involving volatile radioactive iodine were conducted during the reporting period.

BIOASSAY PROGRAM

Bioassays are required for employees at risk of measurable internal radiation exposure and may include thyroid monitoring and urinalysis. The RSOF provides bioassay services for radioactive iodine uptake through thyroid screening and tritium uptake through urinalysis. All bioassay records are maintained by the RSOF and are available for review by the individuals tested. The Bioassay Program has remained inactive since 2021.

RADIOACTIVE IODINE

During the 2025–2026 reporting period, no active iodination laboratories operated at CWRU. The RSOF maintains an inventory of five iodination hoods for deployment as needed. RSOF notification is required before handling more than 1.0 mCi of volatile radioactive iodine. Prior to such procedures, personnel without an existing baseline radioactive iodine bioassay must complete baseline testing, and arrangements must be made to monitor atmospheric effluent releases during the initial use of any new iodination protocol to assess and mitigate potential environmental releases.

Following an iodination procedure, all participating personnel must contact the RSOF to arrange a bioassay by the end of the next business day. No iodination procedures were conducted during the reporting period; therefore, no associated bioassays were required. No workers exceeded 10% of the applicable Ohio Department of Health (ODH) exposure limits.

IODINATION PROCEDURES	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Total	0	0	0	0	0	0	0	1	0	0	0	0

^{125}I BIOASSAYS	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
RSOF Staff	0	0	0	0	0	16	16	16	16	16	16	16
Additional	0	0	0	0	0	0	0	2	0	0	0	0
Total	0	0	0	0	0	16	16	18	16	16	16	16

TRITIUM

Urine bioassays are required for personnel handling more than 10 mCi of tritium (3H), with baseline testing completed before the experiment begins. No urine bioassays were required during the reporting period.

RADIOACTIVE MATERIALS INCIDENTS

EMERGENCY RESPONSE

The RSOF and RSC have established and approved emergency response procedures addressing radioactive material (RAM) spills, releases or loss, fires, internal contamination, and medical emergencies. Response priorities emphasize the protection of human health and safety, followed by property protection. The RSO or designee provides guidance, assistance, and oversight of cleanup as needed. In situations involving imminent threats to personnel, property, or the community, the RSO is authorized to act independently to implement prompt corrective measures.

INCIDENT/ SPILL RESPONSE

MAJOR INCIDENT/ SPILL

This is a spill that involves personnel contamination or results in contamination outside of the intended work area that cannot be easily and effectively contained and cleaned up.

MINOR INCIDENT/ SPILL

This is a spill that does not involve personnel contamination and that remains inside the intended work area; one that can be easily and effectively contained and cleaned up without assistance from the RSOF. It also includes events that trigger irradiator alarms, most of which are caused by mechanical failures and installation of new high-security equipment.

There were no major incidents and seven minor incidents documented over the past year.

INCIDENTS	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Major	0	0	1	2	0	0	0	0	0	0	0	0
Minor	7	19	22	12	15	19	7	11	20	21	22	30
TOTAL	7	19	23	14	15	19	7	11	20	21	22	30

DATE	INCIDENT	CONTAMINATION	ROOT CAUSE	FOLLOW UP
5/30/2026	Minor Incident	IRR Motion Alarm	A researcher at the WRB irradiator facility inadvertently scanned a badge and activated the alarm button, triggering the alarm system.	The proper procedure was reviewed with the researcher, and the prompt response by Police/Security was noted.
4/14/2026	Minor Incident	IRR Network Issue Alert	The WRB RMS communication system experienced a failure, causing the camera to freeze and requiring a system reset to restore functionality.	Follow-up with UGEN was initiated to investigate and resolve the system issue.

2/16/2026	Minor Incident	IRR Motion Alarm	The WRB motion detector was activated when one individual entered the room while another exited.	The alarm was reset, and the individual re-entered the room. Both individuals were reminded to remain attentive to entry and exit procedures to prevent recurrence of this uncommon incident.
2/13/2026	Minor Incident	IRR Comm Loss	WRB & Main Dispatch Comm Loss	Both computers rebooted.
10/31/2025	Minor Incident	35S Legacy waste found	Legacy sulfur-35 (35S) radioactive waste was identified in the Hua Lou laboratory (BRB 609B), with liquid waste found inside a flammable storage cabinet.	The RSOF collected the waste and secured it at DOA 990 pending disposal. In December 2025, the material was surveyed, analyzed, found to be non-radioactive (or decayed), and then disposed of as chemical waste.
8/15/2025	Minor Incident	DOA 990 Alarm	DOA 990 Alarm went off	All doors checked, alarm reset.
7/29/2025	Minor Incident	RAM labeled drawers	Drawers labeled for radioactive materials (RAM) were identified in laboratory BRB 909 for radiation safety review and verification of appropriate labeling and storage practices.	The area was surveyed and confirmed to be free of radioactive materials (RAM), and all RAM labels were removed.

EHS WEBSITE & NEWSLETTERS

The EHS website (case.edu/ehs) provides centralized access to environmental health and safety services, including training schedules, online refresher courses, safety manuals, and other resources. Content is reviewed and updated weekly to maintain accuracy and accessibility. During the 2025–2026 reporting period, 24 website revisions and additions were completed to support the campus community.

EHS publishes a general safety newsletter and a dedicated Radiation, X-Ray, and Laser Safety newsletter on a bi-monthly basis. The general newsletter highlights regulatory updates, safety concerns identified during laboratory inspections, and answers to frequently asked questions. Introduced in 2024, the Radiation, X-Ray, and Laser Safety newsletter addresses common radiation safety issues and violations identified during routine audits and is distributed directly to radiation, X-ray, and laser safety personnel across campus.

During the reporting period, EHS distributed 37 newsletters to 115 campus researchers and produced 37 articles covering radiation safety, emerging technologies, regulatory developments, and general laboratory safety. Topics included nuclear energy and small modular reactors, the Chernobyl and Fukushima cleanup efforts, naturally occurring radioactive materials (NORM), isotope inventory management, personal radiation monitoring, hazardous chemicals, and updated training requirements.

These communication initiatives strengthen campus safety awareness and promote regulatory compliance. Engagement with the Radiation, X-Ray, and Laser Safety sections of the EHS

website has doubled year over year since 2024, demonstrating the growing value of these resources in supporting the University's research and safety community.

LASER SAFETY PROGRAM

OSHA provides technical guidance on protecting workers from ultraviolet radiation and laser-related hazards in its *OSHA Technical Manual*, Section III, Chapter 6, which outlines appropriate exposure controls and laser safety program requirements. This guidance supports CWRU's efforts to maintain effective laser safety practices and protect personnel from occupational exposure.

During the 2025–2026 reporting period, CWRU's laser safety database included 269 lasers and laser systems managed by 58 laser principal investigators across 20 buildings, with 51 PIs with active systems and seven with systems in storage. Covault was added as an Authorized Laser User and designated responsible party for the Physics laser unit in storage, previously assigned to Kash. Class 3B and Class 4 lasers remain the primary safety focus; 60 enclosed systems are classified as Class 1 under normal operating conditions, reducing user exposure risk. Eight laser system audits were completed during the reporting period, and no laser-related incidents were reported.

LASERS	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18
Active Lasers	257	248	250	248	230	241	234	204	207
Storage Lasers	12	5	9	5	6	2	4	6	9
Laser PI	58	57	61	43	45	44	43	39	38
Laser Bldgs.	20	19	23	21	19	16	16	16	16
3B/4 PIs	28	26	33	26	26	27	24	25	25
3B/4 Lasers	155	143	150	146	146	145	144	133	124
1,2,3R PIs	30	31	28	17	19	17	12	14	13
1,2,3R Lasers	114	110	109	104	90	91	92	77	76
Enclosed Lasers	60	53	56	51	41	36	36	31	29
Total Lasers	269	253	259	253	236	243	238	210	216

ULTRAVIOLET (UV) SAFETY PROGRAM

OSHA standards address employee exposure to ionizing radiation (29 CFR 1910.1096) and radiofrequency radiation, including microwaves (29 CFR 1910.97), but do not establish specific occupational exposure limits for ultraviolet (UV) radiation. The American Conference of Governmental Industrial Hygienists (ACGIH), a nongovernmental organization, provides recommended threshold limit values (TLVs) for direct UV exposure to the eyes and skin, published annually in its *Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices*.

CLEARANCES/ RELOCATION PROGRAM

The RSOF requires a minimum of three weeks' advance notice for laboratory decommissioning to ensure proper coordination among the RSOF, EHS Safety Services, Facilities Services, and Authorized Users (AUs). During the reporting period, 543 pieces of equipment were cleared,

and 4 (four) rooms were decommissioned, supporting safe laboratory transitions and regulatory compliance.

CLEARANCES BY MONTH	25/26
7/2025	3
8/2025	34
9/2025	24
10/2025	39
11/2025	65
12/2025	63
1/2026	23, 1 room
2/2026	40
3/2026	70, 1 room
4/2026	2
5/2026	38
6/2026	142, 2 rooms

WASTE MANAGEMENT

RADIOACTIVE WASTE FACILITY

CWRU's Radioactive Waste Facility (RWF) operates under an Ohio Department of Health (ODH) license requiring timely disposal of accumulated waste when the facility is open. The RWF segregates and prepares radioactive waste streams for appropriate disposal, including aqueous waste, sharps, animal waste, scintillation vials, and dry solid waste. Waste management practices prioritize regulatory compliance, personnel safety, and waste minimization.

Phosphorus-32 (32P) solid waste is held for decay for at least 10 half-lives before the exterior of waste bags is surveyed, under ODH approval, and the waste is placed directly into designated burn boxes for shipment to Daniels International in Michigan for incineration. This streamlined process reduces handling, personnel exposure, and disposal costs. Laboratory users are encouraged to minimize waste generation, including unnecessary paper products. Short-lived hazardous waste is held for decay, resurveyed after 10 half-lives, and disposed of through Chemtron. Sulfur-35 (35S) and iodine-125 (125I) are shipped with long-lived solid waste rather than held for decay. Ecology Services manages disposal of long-lived solid waste, including materials with half-lives exceeding 60 days, and scintillation vials.

Nonhazardous aqueous radioactive waste is no longer held for decay. RSOF staff collect this waste from laboratories and discharge it through the sanitary sewer system at the RWF, as permitted by applicable regulations, because activity levels remain well below the limits established under Ohio Administrative Code 3701:1-38-12, Appendix C. All sewer discharges are documented in a log maintained by EHS.

These procedures support safe, efficient, and cost-effective radioactive waste management while minimizing occupational exposure and environmental impact. Continued emphasis on waste segregation, volume reduction, and appropriate disposal pathways reinforces CWRU's commitment to regulatory compliance and radiation safety.

COLLECTION AND DISPOSAL OF ANIMAL REMAINS AND BIOHAZARDOUS WASTE

The RSOF maintains two −20°C freezers for radioactive animal remains and waste, located at the Animal Resource Center (ARC, BRB B05A) and Wolstein Room 1118. Radioactive waste must be placed in labeled yellow bags consistent with dry solid waste procedures and documented on the animal disposal log posted on the cold room door. Laboratories generating the waste must also maintain disposal records for inventory tracking.

Radioactive animal waste, including cage bedding, carcasses, viscera, excrement, blood, serum, and other contaminated tissues, is stored in the designated ARC freezer for disposal. All waste must be properly labeled and logged, and the RSOF is responsible for its collection and final disposal to ensure compliance with radiation safety requirements.

WASTE GENERATED IN FROM JULY 1, 2025 TO JUNE 30, 2026

	GENERATED 7/1/2025-6/30/2026	DISPOSED: DANIELS INTL FACILITY	DISPOSED: SEWER	DISPOSED: CHEMICAL SAFETY	DISPOSED: Ecology Services	IN STORAGE AS OF 6/30/2026
Short-Lived Dry	2	2	0	0	0	2
Long-Lived Dry	1	0	0	0	1	1
Scintillation Vials	1	0	0	0	1	1
Animals	0	0	0	0	0	0
Long-Lived Sewer	40	0	40	0	1	0
Long-Lived Non-Sewer	0	0	0	0	20	2
Short-Lived Sewer	10	0	10	0	0	0
Short-Lived Non-Sewer	0	0	0	0	0	0

All quantities reported for dry solid waste, scintillation vials, and animal waste represent the number of 55-gallon drums; liquid waste quantities are reported in gallons. No decay-in-storage drums generated before July 1, 2025, were surveyed and disposed of during the July 1, 2025–June 30, 2026, reporting period. All accumulated long-lived hazardous aqueous waste was disposed of during the fiscal year.

Commercial disposal costs through Ecology Services are approximately $220 per 10-pound animal waste barrel and $470 per 55-gallon dry waste drum. By comparison, Daniels International charges $25 per biomedical waste container, with an average of two containers per 55-gallon drum. Disposal through Daniels can therefore reduce costs for eligible short-lived radioactive waste.

No decay-in-storage dry waste drums were surveyed and disposed of during the 2025–2026 fiscal year. Consequently, no disposal cost savings were realized through this program during the reporting period; the previously estimated savings of $1,370 were not applicable to this fiscal year.

WASTE GENERATION	25/26	24/25	23/24	22/23	21/22	20/21	19/20	18/19	17/18	16/17	15/16	14/15
Short-Lived Dry	2	2	2	1	3	5	4	6	18	9	11	10
Long-Lived Dry	1	1	1	2	2	2	6	8	6	5	9	6
Scintillation Vials	1	1	3	4	2	2	6	6	6	12	9	10

Animals	0	0	0	0	0	0	0	0	0	1	0.25	1
Long-Lived Sewer	40	30	20	22	20	35	25	35	28	30	23.75	25
Long-Lived Non-Sewer	0	5	0	0	0	0	1	5	2	2	2	2
Short-Lived Sewer	10	10	0	0	5	10	20	30	25	21	18	20
Short-Lived Non-Sewer	0	0	0	0	0	0	1	1	2	0	4	5

CWRU extended its radioactive waste disposal contract with Ecology Services through June 2027. The agreement covers the disposal of long-lived dry radioactive waste, scintillation vials, and radioactive animal waste, supporting continued regulatory compliance and safe waste management.

RECYCLING PROGRAM

The RSOF facilitates the reuse of laboratory equipment in good condition from Authorized Users (AUs) who have left the University or discontinued radioactive materials (RAM) use. Reusable items, including lead and Lucite waste containers, shielding, and radiation survey meters, are made available to other AUs to reduce equipment replacement costs and promote resource conservation. During the 2025–2026 fiscal year, these recycling efforts generated $1,500 in documented cost savings for AUs or EHS.

E-WASTE PROGRAM

As CWRU researchers depart, relocate, or replace equipment, EHS coordinates the removal of obsolete, unused, and damaged items to reclaim laboratory and workspace capacity. Electronic equipment suitable for reuse is directed to RET3 Job Corp., a nonprofit organization that refurbishes and recycles electronics, supporting the Green Computing Program's distribution of refurbished computers to schools and nonprofits throughout Northeast Ohio. Although fewer items were collected for recycling or refurbishment during the reporting period, 250 scheduled e-waste pickups were completed by Demotech during fiscal year 2025–2026.

RADIATION SAFETY COMMITTEE AUDITS

The Radiation Safety Committee (RSC) conducts audits of the Radiation Safety Office (RSOF) through two complementary processes. Individual RSC members perform on-site performance audits throughout the year to assess operational activities and program effectiveness. In addition, an RSC team conducts an annual compliance review of RSOF records shortly after the close of each fiscal year.

These audits evaluate the effectiveness of RSOF operations, verify compliance with applicable regulatory requirements and University policies, and identify opportunities for improvement. Performance audits address the following key areas:

AREA AUDITED	# OF INDIVIDUAL FILES EXAMINED
RAM Applications	10
Isotope Orders/ AU Possession Limits	10
RGE inventory/ training	10
Ancillary staff training	10
AU/ worker training	10
Radiation survey meters	10
Waste disposal facility	2
Shipping papers	10
RAM security checks	10
Bioassays	10
Semi-Annual mailings	10
Sealed sources	10
EHS Radiation Webpage	1
Irradiators	2
Room Surveys (Active/Decommissioned)	10
Compliance Reviews	10
Lasers	10
Licensing	10
Dosimetry	10
Incidents	10

These audits were conducted between October and December 2025 and between March and June 2026. This effort resulted in the review of more than 170 files in the program areas listed above.

RSC TRI-ANNUAL AUDITS FOR 2025-2026

RSC AUDIT COMMENT:

A quarterly audit was performed in October 2025 by members of the Radiation Safety Committee to validate Radiation Safety Compliance.

Active/Decommissioning Room Surveys
AU/Worker Training
Compliance Reviews

Incident Reports
Irradiator User Training/Irradiators
Laser Program
Licensing Status
Radiation Generating Equipment (RGE) Inventory & Training
Security Checks
Survey Meters
Waste Disposal Facilities

Each audit consisted of randomly selecting five to 20 files from the past year to ensure their contents were up-to-date, accurate, and consistent with the database.

Active/Decommissioning Room Surveys

A quarterly audit was performed on October 9th, 2025, by Dr. Zhenghong Lee to validate Active and Decommissioned room survey files to verify that the laboratory was surveyed within the last six months as well as verification for any follow-up on non-compliance issues. 10 files were inspected and one deficiency reported. Dr. Lee noted that some missing files were noted for Robbins - Med East 541. The RSOF was informed for follow up on missing files.

RSOF RESPONSE:

No response required.

AU/Worker Training

Authorized users and worker training files were audited for up-to-date training on radiation safety procedures on October 28th, 2025. Dr. Colleen Croniger reported ten (10) workers that were over 60 days past training. The Radiation Safety Office was notified of these deficiencies and a list of individuals affected was provided.

RSOF RESPONSE:

The 10 workers were notified, and the files were updated.

Compliance Reviews

Compliance reviews were audited on October 28th, 2025, to ensure that any non-compliance issues were appropriately resolved. Upon examination of 10 files, Dr. Colleen Croniger noted no deficiencies.

RSOF RESPONSE:

No response required.

Incident Reports

A review of monthly incident reports was performed by Dr. Suhrim Fisher on October 20th, 2025. Dr. Fisher validated that the SOP for incident reports was up to date. She also noted one (1) deficiency (6/5/25) that needed follow-up and potential corrective action to determine the source of the alarm. The RSOF was informed of the necessary follow-up action items.

RSOF RESPONSE:

The issue was corrected.

Irradiator User Training/ Irradiators

An audit of the Irradiator Information Files was performed by Dr. Thomas McCormick on October 27th, 2025, to verify that the irradiators were audited by the RSOF in the last quarter. The logbook for each irradiator was used to match users for each irradiator. Two irradiators were active on campus, and Dr. McCormick reported a mismatch in the authorized user irradiator logbook. The RSOF was informed of this individual's identification and follow-up was performed. Dr. McCormick also noted no deficiencies in the trained users for the irradiators.

RSOF RESPONSE:

No response required.

Laser Program

The laser program was audited by Dr. Zhenghong Lee regarding laser inspections, inventory, and status of personnel training on October 9th, 2025. Ten (10) files were audited. Three (3) deficiencies in inspection were noted: two laboratories with past-due CHP/ECP plans, and one user that needed a new hard file for the laboratory. The RSOF was notified of these deficiencies.

RSOF RESPONSE:

Reminders were sent to the laser researchers to send their 2026 CHP/ECP.

Licensing Status

An audit was conducted to verify the licensing status of all ODH licenses and registrations on October 13th, 2025, by Dr. Saba Valadkhan. Components of the audit included: Broad Scope, Dental School X-Ray, Case X-Ray, Chemical Hazard and Biological Hazard, Underground Storage, and Radiation-Generating Equipment (RGE) Licenses. Dr. Valadkhan reviewed all license programs and noted that all licenses were current (no deficiencies).

RSOF RESPONSE:

No response required.

Radiation-generating equipment (RGE) inventory and training

Inventory status and equipment surveys were examined by Dr. Thomas Gerken on October 20th, 2025, who examined 10 files for RGE status, including authorized possessors (APs) and persons responsible for RGE. Dr. Gerken noted four (4) deficiencies: two missing hard copy folders, one overdue training, and one overdue inventory inspection. The RSOF was informed of these deficiencies for follow-up.

RSOF RESPONSE:

The inventory was completed. The folders were found. The laboratory was decommissioned and had no x-ray equipment.

Security Checks

Verification and documentation of radioisotope security checks were performed on October 27th, 2025. Dr. McCormick reported one deficiency: Dr. Zhenghong Lee's laboratory required a new contact person to be identified. The RSOF was notified; no other deficiencies were noted.

RSOF RESPONSE:

No response required.

Survey Meters

Compliant calibration of survey meters was audited on October 13th, 2025. Ten (10) files were examined by Dr. Valadkhan, who noted four (4) deficiencies in files that did not match the printed database or meters surveyed that had calibration dates that did not match the calibration date in the database. The RSOF was notified of these deficiencies for follow-up.

RSOF RESPONSE:

The owners of four meters were notified, and the meters were calibrated.

Waste Disposal Facilities

The waste disposal facilities (DOA 990/Wolstein 1118, 1119) and RSOF Laboratory were inspected to ensure safe operation and maintenance as required by RSOF on October 20th, 2025. Dr. Fisher inspected the facilities and reported three (3) deficiencies where the survey records for waste storage were missing. The RSOF was informed of the deficiencies for follow up.

RSOF RESPONSE:

The staff were reminded to ensure weekly inspection.

In January 2026, the RSC members conducted a tri-annual audit of the following components of the RSOF:

Active/Decommissioning Room Surveys
Compliance
Direct Package Pickup
Dosimetry Program
EHS Webpage
Incident Reports
Isotope Possession Limits
Licensing Status
Sealed Sources Leak Tests
Security Checks
Support Staff Training
Semi-Annual Mailings (Air/Sewer Inventory)
Waste Disposal Facilities

Each audit consisted of randomly selecting five to 20 files from the past year to ensure their contents were up-to-date, accurate, and consistent with the database.

Active/Decommissioning Room Surveys

An audit was performed on January 27th, 2026, to validate active RAM use files and decommissioned room files to verify that the laboratory was surveyed within the last six months as well as verification for any follow-up on non-compliance issues. Dr. Suhrim Fisher examined ten (10) files for active rooms and ten (10) files for decommissioned rooms and reported no deficiencies.

RSOF RESPONSE:

No response required.

Compliance

Compliance review audits were reviewed on February 2nd, 2026, to ensure that any non-compliance issues were appropriately resolved. Upon examination of 10 files, Dr. Thomas McCormick reported no deficiencies.

RSOF RESPONSE:

No response required.

Direct Package Pickup

An audit was performed on January 21st, 2026 to verify that package receipts were completed with each transfer of material from site to site. Dr. Thomas Gerken noted no deficiencies in two records examined.

RSOF RESPONSE:

No response required.

Dosimetry Program

An audit of current dose records held by the RSOF was performed on February 4th, 2026, to verify that AU laboratory workers were current in dose record and active radiation badges. Dr. Thomas McCormick audited 10 records and reported four (4) badges that had not been picked up. The RSOF was informed of the user IDs and performed follow-up. Dr. McCormick also noted that the SOP for Dosimetry reporting was up to date.

RSOF RESPONSE:

The four workers were notified, and their badges were collected.

EHS Webpage

The website for the RSOF was audited on Feb 2nd, 2026 to ensure proper operation, access and current links were operational. Dr. Saba Valadkhan reported all links within the Radiation Website were operational, including material requisition, sample survey meter map legend, environmental release form, external transfer form, internal transfer form, isotope inventory, waste accumulation, sewer disposal, application for nonhuman use of radiation material, and incident reports.

RSOF RESPONSE:

No response required.

Incident Reports

A review of monthly incident reports was performed by Dr. Zhenghong Lee on January 16th, 2026, for verification and documentation of follow-up by the RSOF. During this period, one (1) incident was reported as a waste pickup of a rad-labeled vial with unknown isotope for Dr. Lou. The RSOF followed up on this incident.

RSOF RESPONSE:

The vial was collected, analyzed, and determined to be non-radiative. The vial was disposed of as chemical waste.

Isotope Possession Limits

Dr. Colleen Croniger audited 10 PI files on February 5th, 2026, to verify that the amount of radioactive material (RAM) ordered was within the possession limits of the AU and that all orders placed were in the Helix Database. Dr. Croniger noted that no isotope exceeded the PI possession limit.

RSOF RESPONSE:

No response required.

Licensing Status

An audit was conducted to verify the licensing status of all ODH licenses and registrations on January 21st, 2026, by Dr. Thomas Gerken. Dr. Gerken reviewed all license programs and noted that all licenses were current.

RSOF RESPONSE:

No response required.

Sealed Source Leak Tests

Files verifying that sealed sources had been leak tested were audited on February 2nd, 2026, by Dr. McCormick. Ten PI files were examined with no deficiencies noted.

RSOF RESPONSE:

No response required.

Security Checks

Verification and documentation of radioisotope security checks were performed on January 16th, 2026. Dr. Zhenghong Lee reported that no security check violations were issued during the last quarter.

RSOF RESPONSE:

No response required.

Support Staff Training

An audit was conducted to verify the training status of personnel encompassing ancillary segments of the radiation safety program including the Animal Resource Center (ARC), Shipping/Receiving, Custodial, Security, and Plant Security, on February 5th, 2026. Dr. Colleen Croniger examined Ancillary Radiation Training Files and identified ten (10) deficiencies in past-due training for ancillary staff. The RSOF was notified of these deficiencies for follow-up.

RSOF RESPONSE:

The 10 support staff workers were notified and their training was updated.

Semi-Annual Mailings (Air/Sewer Inventory)

An audit of the air/sewer disposal inventory was performed on February 5th, 2026. All files were reviewed by Dr. Colleen Croniger, who noted no deficiencies in active PIs. Dr. Croniger also noted that the SOP for semi-annual mailings was up to date.

RSOF RESPONSE:

No response required.

Waste Disposal Facilities

The waste disposal facilities (DOA 990/Wolstein1118, 1119) and RSOF Laboratory were inspected to ensure safe operation and maintenance as required by RSOF on January 27th, 2026. Dr. Suhrim Fisher inspected the facilities and reported that surveys were missing for the weeks of 1/5-1/9/2026 and 1/19-1/23/2026 for all facilities. The RSOF was notified of the missing surveys, and the updated surveys were reviewed.

RSOF RESPONSE:

The staff were reminded to ensure weekly inspection.

In April 2026, the RSC members conducted a tri-annual audit of the following components of the RSOF. The audit was performed as scheduled in person on campus.

AU/Worker Training
Dosimetry Program
EHS Webpage
Irradiator Information Review
Laser Program
Licensing Status
RGE inventory and training
Security Checks
Support Staff Training
Survey Meters
Valid RAM Applications
Waste Disposal Facilities

Each audit consisted of randomly selecting five to 20 files from the past year to ensure their contents were up-to-date, accurate, and consistent with the database.

AU/Worker Training

Authorized users and worker training files were audited for radiation safety training on April 14th and 16th, 2026, by Drs. Colleen Croniger and Suhrim Fisher. They identified numerous workers that were between 30 - 60 days past training. The RSOF was notified of the individuals with out-

of-date training. In addition, Dr. Fisher noted that the instructions for performing this audit are outdated now that the training list for workers is online and suggested updating the audit instructions.

RSOF RESPONSE:

The workers were contacted, and the training was updated in the database. The audit instructions were revised to request use of the training delinquency report in the database.

Dosimetry Program

An audit of the dosimetry records was performed on April 16th, 2026, to verify that AU laboratory workers were current in dose record and active radiation badges. Dr. Colleen Croniger audited 10 records and reported six (6) deficiencies where badges were not picked up. The RSOF was informed of the individuals delinquent for badge pickup.

RSOF RESPONSE:

The individual were contacted.

EHS Website

The website for the RSOF was audited on April 29th, 2026, to ensure proper operation, access and current links were operational. Dr. Thomas McCormick reported all links within the Radiation Website were operational, including pregnancy reporting form, SAIRC form, purchase requisition forms, laser safety, and OSHA links.

RSOF RESPONSE:

No response required.

Irradiator Information Review

An audit of the Irradiator Information Files was performed by Dr. Thomas Gerken to verify that the irradiators were audited by the RSOF within the past quarter. The audit was performed on April 15th, 2026. Two irradiators were active on campus at this time, and each file was up-to-date and compliant. Dr. Gerken noted no overdue users for training.

RSOF RESPONSE:

No response required.

Licensing Status

An audit was conducted to verify the licensing status of all ODH licenses and registrations on April 16th, 2026. Components of the audit include: Broad Scope license, RGE license, and RSC

guidelines and members. Dr. Zhenghong Lee reviewed all license programs and noted that all licenses were current (no deficiencies).

RSOF RESPONSE:

No response required.

Radiation-generating equipment (RGE) inventory and training

Tri-annual inventory status and equipment surveys were examined by Dr. Suhrim Fisher, who examined 10 files on April 14th, 2026. Dr. Fisher noted two deficiencies: one worker missing a training date and a missing physical file for Dr. Samia. The RSOF was notified of the deficiencies.

RSOF RESPONSE:

No response required. The worker training and file were on the desk for processing.

Security Checks

Verification and documentation of radioisotope security checks were performed on April 6th, 2026. Dr. Saba Valadkhan examined 10 files and noted no deficiencies for this quarter.

RSOF RESPONSE:

No response required.

Support Staff Training

An audit was conducted to verify the training status of personnel encompassing ancillary segments of the radiation safety program including the Animal Resource Center (ARC), Shipping/Receiving, Custodial, Security, and Plant Security, on April 5th, 2026. Dr. Suhrim Fisher examined Ancillary Radiation Training Files and identified ten (10) deficiencies in past-due training for ancillary staff. The RSOF was notified of these deficiencies for follow-up.

RSOF RESPONSE:

The 10 support staff workers were notified, and their training was updated.

Survey Meters

Compliant calibration of survey meters was audited on April 14th, 2026, by Dr. Suhrim Fisher. Ten (10) files were examined, and no deficiencies were noted.

RSOF RESPONSE:

No response required.

Valid RAM Applications

RAM applications were audited on April 16th, 2026, to verify that the applications were complete and valid. Dr. Zhenghong Lee audited ten (10) files and reported six with no deficiencies; he did note that 2 individuals were overdue for training. The RSOF was informed of these individuals for follow-up.

RSOF RESPONSE:

The 10 applications were reviewed and updated in the database. Individuals due for training wee contacted.

Waste Disposal Facilities

The waste disposal facilities (DOA 990/ Wolstein 1118, 1119) and RSOF Laboratory were inspected to ensure safe operation and maintenance as required by RSOF on April 29th, 2026. Dr. Thomas McCormick inspected the facilities and reported that all records of maintenance, housekeeping, and waste storage and handling were in compliance. The SOP was also validated for current procedures.

RSOF RESPONSE:

No response required.

Overall, this tri-annual part of the audit process was successful. Records were easily accessed and reviewed. The program was found to be efficient. Productive interaction among committee members and the RSOF staff during the audit process expedites the procedure. All corrections to the files and the OnSite database were made following each trimester audit.

ANNUAL RADIATION SAFETY PROGRAM AUDIT REPORT

The RSC conducted its annual audit of the RSOF in June 2026. The committee reviewed the performance of 20 components of the RSOF. Please note that audis for October, January/February, April, and the annual audit were performed as scheduled in person on campus. The RSC members are to be commended for their participation and response to the duties of the committee. The areas audited were:

- Ancillary Staff Training
- AU and Worker Training
- Bioassay Program - Inactive
- Compliance Review
- Direct Package Pickup
- EHS Radiation Website

- Incident Reports
- Licensing Status
- Radiation Generating Equipment Inventory and Training
- Room Surveys
- Semi-Annual Mailings (air/sewer inventory)
- Radiation Survey Meters
- Isotope Orders, AU Possession Limits, and the database
- Dosimetry Program
- Irradiator Program Review
- Laser Program Review
- Radioisotope Security Checks
- Sealed Sources
- Valid RAM Application
- Waste Disposal Facilities (DOA 990, Wolstein) & RSOF Laboratory

The results of this audit are summarized in this report as follows:

Ancillary Staff Training

Dr. Suhrim Fisher audited the records of Ancillary Staff Training to verify the retraining status of these personnel on June 23rd, 2026. Dr. Fisher reported that ten (10) staff members had not completed retraining for the period July 1st, 2025- June 12th, 2026. The names of the individuals due for training were reported to the RSOF for follow-up.

RSOF RESPONSE:

Ten workers were notified via email and phone calls to determine if they were still at CWRU. Those that had left were archived in the database, while the others did retrain.

AU and Worker Training

An annual audit was conducted on June 1st, 2026, to verify the training status of Authorized Users and worker training files for the period from July 1st, 2025 to June 1st, 2026. Dr. Colleen Croniger reported that thirteen (13) workers were overdue. The RSOF was notified of the overdue training and performed follow-up contact.

RSOF RESPONSE:

The 13 workers were notified via email and phone calls to determine if they were still at CWRU. Those that had left were archived in the database, while the others did retrain.

Bioassays

This program has been inactive since 7/2021 as there has been no use of >10mCi of ^{3}H and/or >1mCi ^{125}I in the laboratories.

RSOF RESPONSE:

No response required.

Compliance

Compliance review audits were reviewed for the period July 1st, 2025-June 4th, 2026, on June 4th, 2026, to ensure that any non-compliance issues were appropriately resolved. Upon examination of 50 files, Dr. Zhenghong Lee noted ten (10) files that needed to be reviewed/updated, mostly for expired CHP/ECP documentation. The RSOF was informed of these necessary follow-up records.

RSOF RESPONSE:

Reminder emails were sent to the 10 AUs requesting their 2026 CHP/ECP submittal.

Direct Package Pickup

An audit was performed on June 3rd, 2026, to cover the period of July 2025-June 2026, to verify that package receipts were completed with each transfer of material from site to site. Dr. Zhenghong Lee noted no issues in direct package pickup during this timeframe.

RSOF RESPONSE:

No response required.

Dosimetry Program

An audit of current dose records held by the RSOF was performed on June 11th, 2026, covering the dosimetry program from July 2025-June 2026, to verify that AU laboratory workers were current in dose record and active radiation badges. Dr. Saba Valadkhan audited fifty (50) records and reported twenty-three (23) missing dose records. The RSOF was notified of the missing records.

RSOF RESPONSE:

The 23 dose records were noted as inactive, as the people were no longer at CWRU. This was also documented in the database.

EHS Radiation Webpage

The website for the RSOF was audited on June 23rd, 2026, to ensure proper operation, access and current links were operational for the period July 2025-June 2026. Dr. Fisher reported all links within the Radiation Website were operational, including laser safety, waste disposal, material purchase requisition forms, and student training.

RSOF RESPONSE:

No response required.

Incident Reports

A review of yearly incident reports was performed by Dr. Thomas Gerken on June 1st, 2026, for the period July 2025-June 2026 to verify documentation of follow-up by the RSOF. Dr. Gerken reviewed six (6) incident reports for the period and noted that all had been resolved by the RSOF.

RSOF RESPONSE:

No response required.

Irradiator Information Review

The annual audit of the Irradiator Information Files was performed by Dr. Valadkhan on June 1st, 2026, to verify that the irradiators were audited by the RSOF in the last quarter. The logbook for each irradiator was used to match users for each irradiator. Two irradiators were active on campus and Dr. Valadkhan reported no issues for the irradiators.

RSOF RESPONSE:

No response required.

Isotope Orders, AU Possession Limits, and the Database

Dr. Zhenghong Lee audited 11 PI files on June 4th, 2026, to verify that the amount of radioactive material (RAM) ordered was within the possession limits of the AU and that all orders placed were in the Helix Database. Dr. Lee noted that no isotope orders exceeded the PI possession limit.

RSOF RESPONSE:

No response required.

Laser Program

The annual laser program audit was performed by Dr. Saba Valadkhan on June 5th, 2026. Fifty (50) files were audited, and seventeen (17) individuals were identified whose training status was in need of an update. Inventory status of all the inspected files was correct. The RSOF was notified of the responsible PI to contact for follow-up on worker training.

RSOF RESPONSE:

Training for the 17 laser workers noted as past due was completed within the month and filed promptly. Notifications were also sent to workers for training, and the database was updated.

Licensing Status

An audit was conducted on June 1st, 2026, to verify the licensing status of all ODH licenses and registrations during the period July 2025 - June 2026. Components of the audit including the Broad Scope license, RGE license, Waste license, Radiation Manual, X-ray Manual, Laser Manual, Radiation Training, X-Ray Training, Radiation Online Training, and RSC guidelines were reviewed by Dr. Colleen Croniger. She reported that all licenses reviewed were in compliance. Dr. Croniger also noted that the Waste license contract was due for renewal.

RSOF RESPONSE:

The CWRU waste disposal contract which expires at the end of the month, is in the process of renewal.

Radiation-Generating Equipment (RGE) Inventory and Training

Quarterly inventory status and equipment surveys were examined by Dr. Valadkhan on June 1st, 2026, who examined 50 files for the period July 2025-June 2026. Dr. Valadkhan noted four units that needed attention from the RSOF. The RSOF was informed of the equipment and location for follow-up.

RSOF RESPONSE:

The quarterly inventory was changed to a semiannual inventory requiring the inventory collection of four additional units, which made them current.

Room Surveys

An audit was performed on June 3rd, 2026, to validate active RAM use files and decommissioned room files for the period July 2025-June 2026, to verify that the laboratory was surveyed within the last six months as well as verification for any follow up on non-compliance issues. Dr. Thomas McCormick examined twenty-six (26) files and noted one room that had out-of-date decommission postings. The RSOF was informed of the location of the room.

RSOF RESPONSE:

The one room folder was updated to reflect the date of decommissioning.

RAM Security Checks

An annual review for verification and documentation of radioisotope security checks was performed on June 1st, 2026. Dr. Croniger reviewed security check logs for the past year (July 2025-June 2026) and noted that all audits were up to date.

RSOF RESPONSE:

No response required.

Sealed Source Leak Tests

The annual audit of files verifying that sealed sources had been leak tested was performed on June 3rd, 2026, by Dr. Thomas McCormick. Dr. McCormick examined fifty (50) files and reported no deficiencies.

RSOF RESPONSE:

No response required.

Semi-Annual Mailings (Air/Sewer Inventory)

An annual audit of the air/sewer disposal inventory was performed on June 1st, 2026, for the period July 2025-June 2026. All files were reviewed by Dr. Thomas Gerken, who noted no deficiencies in active PIs.

RSOF RESPONSE:

No response required.

Survey Meters

Compliant calibration of survey meters was audited on June 3rd, 2026, for the period July 2025-June 2026. Fifty (50) files were examined by Dr. Thomas McCormick, who noted no deficiencies in meter calibration for the period.

RSOF RESPONSE:

No response required.

Valid RAM Applications

An annual review of valid RAM applications was performed on June 3rd, 2026, to verify that applications were complete and valid. Dr. McCormick audited twenty-two (22) files (13 active users and 9 storage laboratories) and reported no deficiencies.

RSOF RESPONSE:

No response required.

Waste Disposal Facilities

The annual audit of the waste disposal facilities (DOA 990/ Wolstein 1118, 1119) and RSOF Laboratory were performed on June 23rd, 2026. Dr. Suhrim Fisher inspected the SOP and reported it was current and up to date. Waste facilities were physically inspected, and all records of maintenance, housekeeping, waste storage, and handling were in compliance.

RSOF RESPONSE:

No response required.

SUMMARY

The RSOF program continues to operate effectively, with no major deficiencies identified. RSOF staff demonstrate a high level of competence and maintain effective oversight of radiation safety operations and regulatory compliance.

RSOF RESPONSE:

The RSOF appreciates the RSC's thorough review of radiation safety activities over the past year. Any deficiencies identified during the audit have been referred to the RSOF auditor for enhanced monitoring and follow-up during the upcoming year to support continuous improvement and regulatory compliance.

EHS INTERNAL AUDITS

Three layers of audits are utilized by the RSOF on an ongoing basis to ensure that the radiation safety programs and procedures are working smoothly. In addition to audits conducted by the RSOF staff and RSC, the Assistant RSO conducts quality control reviews of all programs and records and assists with resolution. Full audit results of the program are available in the EHS office.

Sealed Source	RAM Security Checks	Bioassays
Shipping Papers	Semi-Annual Mailings	Dosimetry
Valid RAM Applications	RGE Inventory/ Training	Survey Meters
Isotope Orders/ AU Possession Limits	Ancillary Training	Compliance Reviews
AU/ Worker Training	Licensing	EHS Radiation Webpage
Waste Disposal Facility	Incidents	Laser Program
Active/Decommissioned Room Surveys	Irradiators	

Corrections to the files were made promptly. In response to internal audit findings, radiation safety continues to improve its procedures and programs.

This report was prepared by Felice T. Porter on 10/8/2026. It covers fiscal year 7/1/2025-6/30/2026.

APPENDIX

AUTHORIZED USERS WITH STATUS CHANGE DURING FISCAL 2025-2026

RADIATION ACTIVE (0)

STORAGE MODE
Colleen Croniger (3/20/2026) Thomas McCormick (3/20/2026)

RADIATION INACTIVE
Jonatha Gott (6/29/2026)

DEPARTED (0)

X-RAY AUTHORIZED POSSESSOR LIST

AP NAME	CONTACT PERSON	UNITS
Zhenghong Lee	Chris Flask	3
Jeffrey Pigott	Jeffrey Pigott	3
Anna Samia	Anna Samia	2
Steve Schomisch	Steve Schomisch	1
Andrew Shoffstall	Andrew Shoffstall	1
Syed Ali	Jeny Lanning	68
Lei Zhu	Lei Zhu	2

LASER USERS

Active:

Ozan Akkus (3)	Eric Baer (3)	James Basilion (4)	Harihara Baskaran (2)
Jesse Berezovsky (9)	Laura Bruckman (1)	Clemens Burda (7)	Rui Cao (4)
Sudha Chakrapani (1)	Brian Cobb (1)	Carlos Crespo (13)	Andrew Dacks (1)
Amar Desai (5)	Claire Dorsett (5)	Mohammed Draz (1)	Diana Driscoll (18)
Dominique Durand (3)	Steven Eppell (11)	Stanton Gerson (2)	Alex Huang (3)
Hatsuo Ishida (6)	Michael Jenkins (12)	Jonathan Karn (1)	Kathleen Kash (8)
Chirag Kharangate (8)	Lydia Kisley (11)	Claudia Mizutani (2)	Michael Moffitt (11)
Svetlana Morozova (8)	Patrick Osei-Owusu (1)	Andre Paes (2)	Paul Park (1)
Rajesh Ramachandran (4)	Valentin Rodionov (1)	Andrew Rollins (16)	Samuel Root (3)
Britton Sauerbrei (1)	Daniel Scherson (21)	Bryan Schmidt (7)	Alp Sehirlioglu (2)
Andrew Shoffstall (1)	Scott Sieg (2)	Daniel Simon (1)	Jonathan Stamler (1)
Giuseppe Strangi (14)	David Wald (2)	Christopher Wirth (1)	Gary Wnek (2)
Gabriella Wolff (1)	Lei Zhu (1)	Peter Zimmerman (1)	Christian Zorman (5)

Storage:

Sudha Chakrapani (1)	Corbin Covault (1)	Roger French (3)	Ya-Ting Liao (3)
Michael Martens (2)	Heidi Martin (1)	Thomas McCormick (1)	

Archive:
Walter Boron (2 lasers to Ramachandran)

EHS Organizational Chart 2025-2026

