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Mission Statement

The mission of the Environmental Health & Safety Office is to support the University's teaching, research and health care activities by providing guidance, training and services to the institution and its employees. Our goal is to promote and foster a safe working environment by incorporating health and safety into the daily operations of the University, resulting in the prevention of injuries and illnesses of faculty, staff and students, promotion of best practices as well as compliance with federal, state, and local regulations and laws governing the activities of the institution.

Responsibility Statement

The Environmental Health & Safety Office (EHS) is responsible for the administration of the biological safety, chemical safety, occupational safety, radiation safety, and specific environmental programs, and other programs deemed necessary for the health and safety of the University community. EHS program activities are organized into five sections that are supported by an administrative group. These sections are: 1) Biological Safety; 2) Occupational Safety; 3) Environmental Programs; 4) Radiation Safety; and 5) Chemical Safety.

Aspirations

The Environmental Health & Safety Office aspires to make significant contributions to the University by:

- Functioning as a major resource for environmental health, safety and environmental protection.
- Integrating health protection and safety practices into employee and departmental activities.
- Communicating effectively so staff can readily use the resources created and services provided.
- Providing quality service to foster a safe and healthful workplace.
Executive Summary

In addition to routine business activities, EHS focused on the following areas during the last fiscal year: (1) gaining approval of a new UI Safety and Health Policy; (2) conducting a review of the inventories held in laboratories working with biological safety level 2 (BSL2) organisms; (3) creating a workplace safety and health webpage, located on the EHS website; and (4) adapting EHS program needs to changes in EHS staffing.

1. Safety, Health, and Environment Policy. Beginning in 2012, the Workplace Occupational Safety and Health Work Group identified a strategic goal to create a safety and health policy which would be signed by the University of Iowa President, Sally Mason. Although a new initiative for this group, the Environmental Health and Safety Office had worked over many years to have a University-wide safety policy. The group determined it would be more expeditious to revise an existing Environmental Policy in the University Operations Manual to include principles and commitments related to safety and health, rather than create a new policy. During the span of two years, significant effort was spent obtaining stakeholder approval. The outcome was realized in August 2014, when the new Safety, Health, and Environment Policy was signed by President Sally Mason. The policy can be found at: http://opsmanual.uiowa.edu/administrative-financial-and-facilities-policies/safety-health-and-environment-policy.

2. Biological inventory update/review. Due to several lapses in biosafety practices in federal microbiology laboratories in 2014, the National Institutes of Health and other governmental entities requested that research institutions conduct an inventory of infectious agents and toxins to ensure the institution has a record of the agents and toxins used by its researchers. In addition, information on where and how these items are being stored needed to be tracked.

To address the requests for action on this issue, EHS Biosafety staff visited all laboratories that work with BSL2 organisms and performed a quality control check of the agents stored in the labs’ freezers to ensure EHS’s inventory records are accurate. It should be noted that for the last several years, when performing the annual laboratory audit, EHS Safety Advisors have requested updates to each lab’s agent inventory; consequently, a baseline of information for UI research was already in existence. This check of the laboratories did not find any significant changes to what was already listed in the laboratory inventories. By knowing what organisms are in the laboratories, we will be better able to ensure they are stored appropriately and any that are no longer needed are disposed of appropriately. This will help ensure researchers practice good laboratory housekeeping, which is necessary in providing safe environments for researchers and students in labs.

3. Workplace Safety and Health information. As noted above, in 2012, the Workplace Occupational Safety and Health Work Group identified the need to have a webpage dedicated to general workplace safety and health information. This site was developed and launched in 2014 and can be found at: http://ehs.research.uiowa.edu/workplace-occupational-safety-resources.
4. **EHS Staffing changes.** The EHS Office saw a number of long-time staff retire over the past couple of years. Numerous changes in staffing, along with the UI’s 2015 Early Retirement Incentive Program necessitated the restructure and/or shift of significant duties to meet each of the program’s needs (i.e., Administration, Chemical Safety, Environmental Programs, and Occupational Safety). In addition, due to expanding program needs (i.e., Biosafety), we added new positions to meet the University’s evolving health and safety needs.
Biological Safety Section

The Biological Safety Section is responsible for the administration of programs in the research and non-research community that involves the management of biological or infectious agents and biohazardous materials used at The University of Iowa. The covered programs include general biological safety, bloodborne pathogens, recombinant DNA, select agents, and shipping/transportation of infectious substances/biological substances with or without dry ice. Administration of these is accomplished by developing, recommending, administering and implementing policies and procedures that promote the safe use of the types of materials covered by each program, as well as exercising surveillance and enforcing standards for health and safety within their jurisdiction.

Biological Safety Program

Scope: This program provides support to areas that work with biological materials or infectious agents, which primarily include clinical and research lab areas. The program consists of maintaining a biosafety manual and reference materials, providing health and safety consultation to the University’s Biohazardous Waste Program, reviewing protocols where biosafety level 2 or 3 organisms are manipulated, providing biosafety signs, prescribing safe handling techniques, and conducting site visits for containment and/or regulatory assessments.

Activities and Accomplishments for FY15:

- Reviewed 275 protocols submitted primarily from Animal Protocols (AP) and Hazard Containment Protocols; in addition, one material transfer agreements (MTA) was reviewed.
- Reviewed grant notifications from Division of Sponsored Programs which involved use of human pathogens or stem cells.
- Updated the web-based Basic Biological Safety course.
- Updated the web-based Advanced Biosafety course.
- Updated the web-based Biosafety Cabinet course.
- Updated biosafety web documents.
- Published Lab News articles that were distributed to the research community.
- Updated biological agent inventories for research staff following their annual laboratory audit.
- Received requests from six investigators for documentation of their laboratories or other authorization, related to funding or ordering materials from suppliers.
- Trained the Associate Biological Safety Officer who was hired just prior to the start FY15.
- Hired and trained a new Safety Specialist in support of the Biosafety Section.
- Hired a second Associate Biological Safety Officer.
- Evaluated six injuries/possible exposures, non-bloodborne pathogen related.
- Reviewed registration documents for the human pluripotent stem cell committee and program; four proposed research projects were reviewed and approved.
- Collaborated with Office of Animal Resources to review and revise procedures for the handling and disposal of animal waste from animals exposed to agents (non-recombinant) requiring ABSL1/2 housing.
• Monitored both the Iowa Administrative Bulletin and the Federal Register for regulatory changes which may impact the biological safety programs.
• Responded to the National Biosafety Stewardship month by reviewing internal oversight of biosafety at the University and spot checking -80°C freezers for inventory accuracy of all laboratories possessing or formally possessing Risk Group 2 biological agents; Biosafety staff spent over 100 hours on inventory review alone.

**Biological Safety Equipment Certifications**
Scope: This program involves overseeing the biosafety cabinet certification, repair and maintenance contract with ENV Services. Administration of the program involves coordinating the testing and repair of biological safety cabinets (BSCs) and horizontal flow equipment, in compliance with NSF Standard 49 and industry standards, for their safe operation and maintenance, scheduling cabinet decontaminations for repair or prior to a move, and billing for all services performed by ENV technicians.

**Activities and Accomplishments for FY15:**
• Reviewed use and approved the purchase of 25 new BSCs.
• Scheduled 598 BSCs for certification.
• Scheduled certification of 19 horizontal flow cabinets.
• Scheduled formaldehyde or vaporous hydrogen peroxide (VHP) decontamination of 97 BSCs.
• Scheduled annual testing of other HEPA-filtered safety equipment including Thoren cage racks, an ultra-centrifuge, and roof-top exhaust HEPA filter units for the BSL3 labs.
• Scheduled troubleshoots and/or repair service for 100 cabinets.
• Worked with PIs and ENV to obtain 78 quotes for service.
• Updated BSC web document.
• Validated 2 BSC decontaminations.

**Bloodborne Pathogens Program (BBP)**
Scope: This program is intended to assist departments in meeting the requirements of OSHA's Bloodborne Pathogens Standard. This law, as defined by OSHA, covers individuals whose duties entail reasonably anticipated contact with blood and blood products and other potentially infectious materials. The purpose is to reduce or eliminate the risk of exposure to bloodborne pathogens in clinical, research, teaching, service and administrative units.

**Activities and Accomplishments for FY15:**
• Reviewed and/or updated 44 Exposure Control Plans (ECP) upon request.
• Updated the University's ECP template, and provided notice of the update to UI departments.
• Updated EHS's four online BBP training courses.
• Evaluated four possible BBP exposures.
• Continued to contact departmental BBP Exposure Control Officers to ascertain status of their BBP Exposure Control Program (ECP).
DOT Transportation Compliance Program: Shipping/Transportation of Infectious Substances and/or Dry Ice

Scope: The Department of Transportation (DOT) and International Air Transport Association (IATA), which regulate the shipping of hazardous materials, require that individuals who ship materials defined as infectious substances or diagnostic specimens receive training to ensure they have knowledge of and are thus able to comply with shipping regulations. Since these often involve shipments using dry ice, a hazardous material, information on shipping with dry ice is included in this training course. A separate course for individuals who use dry ice to ship otherwise non-hazardous materials is also available.

Activities and Accomplishments for FY15:
- Reviewed the online Shipping Infectious Substances, With or Without Dry Ice course and the Shipping With Dry Ice course to ensure compliance with the 2015 updates to the IATA/DOT regulations.
- Created and posted a new Shipping Infectious Substances Program informational document.
- Updated shipping web documents, as necessary.

Recombinant DNA Program

Scope: The National Institutes of Health’s NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines) governs the creation of recombinant DNA molecules and their use in organisms, human subjects, animals, and plants. Compliance authority on campus is placed with the Institutional Biosafety Committee (IBC) for review of recombinant DNA use. EHS's Biosafety Officer and Director are members of the committee and also coordinate the committee's review process; biosafety section staff generates the approval letters that are sent to PIs after IBC review and inspects laboratories for proper procedures, practices, facilities, and experience.

Activities and Accomplishments for FY15:
- Approved 170 new rDNA protocols.
- Approved 134 amendment requests to active rDNA protocols.
- Reviewed ACURFs and ACURF amendments to ensure all recombinant work is registered with the IBC.
- Received 347 grant notifications from Division of Sponsored Programs which involved recombinant DNA.
- Held 26 IBC meetings.
- Utilized the rDNA database to track and facilitate annual reviews of protocols.
- Conducted monthly reviews of protocols approved 1 and 2 years prior to assess status and ensure notification of any significant changes made by the PI. Protocols reviewed: 272.
- Each month, notified PIs of expired protocols. (Protocols are approved for a maximum of 3 years.) Inactivated 110 expired protocols from further review. In addition, inactivated 27 protocols before they expired (PI reported the rDNA work was no longer active or the PI left the University).
• As part of the laboratory audit program, conducted audits of all BSL2 laboratories using rDNA.
• Provided one-on-one assistance for faculty and staff that had issues when accessing/using the online registration process.
• Updated rDNA web documents.
• Provided the annual NIH/OBA membership report to the Associate Vice President for Research for Regulatory Affairs and updated our registration with NIH/OBA’s online Institutional Biosafety Committee Registration Management System (IBC-RMS).
• Recruited one new IBC member.
• Updated EHS’s two online training courses for researchers using rDNA, UI and VAMC courses.
• Revised an internal program SOP and updated procedures for IBC review of rDNA documents.
• Continued communications with NIH/OBA staff on the proper housing requirements of large and small animals exposed to recombinant agents requiring ABSL1/2 housing.
• Collaborated with Office of Animal Resources to review and revise procedures for the handling and disposal of animal waste from animals exposed to recombinant agents requiring ABSL1/2 housing.
• Participated in building design meetings regarding the new animal care facilities.
• Continued to work with RIS on the new rDNA management system.
• Implemented the new eIBC database to replace Access.
• One possible exposure was reported to NIH/OBA that required review and follow-up.

Select Agent Program
Scope: The program was developed in response to the 2001 Patriot Act and the 2002 Public Health Security and Bioterrorism Preparedness and Response Act to provide compliance oversight and administrative support to researchers who wish to use biological agents and toxins that present a severe threat to human, animal, or plant products (select agents). The program establishes requirements concerning registration, security risk assessments, safety plans, security plans, emergency plans, training, transfers, record keeping, inspections and notifications to CDC or USDA/APHIS. The regulations are designed to provide protection against misuse of select agents and toxins whether inadvertent or the result of terrorist acts against the United States homeland or in the commissioning of other criminal acts. Registering with the DHHS (CDC) or USDA involves submitting an application form, obtaining approval from the Department of Justice for each person who will have access to select agents, and the laboratory facility undergoing an inspection by DHHS/USDA. The UI has assigned Haley Sinn, Biological Safety Officer, as the Responsible Official (RO). Nyree Maes, Associate Biological Safety Officer and Carol McGhan, EHS Director, serve as alternate ROs. These individuals are authorized to receive or ship the agents and serve as the primary contact(s) with the registering agency. Principal Investigators are exempt from registering with the CDC or USDA if they possess toxins in quantities that are below the amount listed in the regulation. Clinical labs are also exempt from registering if they destroy or transfer agents after being isolated from clinical samples and required agency reporting.
Activities and Accomplishments for FY15:

- Maintained the list of current active/approved individuals who are allowed access to the BSL3 rooms/areas.
- Updated select agent campus inventory, as necessary.
- Held monthly meetings with two groups for safety/security issues related to select agent work.
- Performed an annual general biosafety and security inspection of the laboratories registered under 42 CFR 73.
- Audited the select agent inventory records annually.
- Audited the BSL3 training records for researchers, manager, director, emergency response staff, support staff and RO/ARO.
- Revised internal SOPs for the Select Agent Program.
- Updated EHS’s Select Agent Program website.
- Participated in annual drill/exercises at select agent facilities to test and evaluate the effectiveness of the three plans for each facility.
- Collaborated with the two groups to prepare and conduct annual training for individuals who are allowed access to the BSL3 rooms/areas.
- Submitted amendment requests to CDC in order to update our registration, as necessary.
- Submitted Form 2s, 3s, and 4s to CDC, as necessary.
- All new PIs sign a form declaring that they do/do not have any select agents or toxins. The declaration form is kept on file in EHS. Each PI using exempt quantities of toxins on the select agent list signs a separate form to attest that he/she knows there is a quantity limit and must maintain his/her toxin inventory below that limit to remain exempt.
- Collected two exempt toxin transfer forms to document due diligence in the transfer.
- Three facilities were re-commissioned, as part of the annual requirement for the select agent program.
- Completed pre-assessment review of new users and on-going suitability review of current users, as necessary.
- Held meetings to discuss suitability concerns, as necessary.
- Held annual Suitability Assessment Review meeting to review all Tier 1 users.
- Conducted monthly audits of all BSL3 laboratory facilities.
- Reviewed 11 protocols submitted with revisions and/or for annual review by the CCOM BLS3 Committee.
- Completed quarterly staff checks of all CCOM-BSL3 registered users.
- Continued to scan select agent related documentation and update the Excel spreadsheet to record and track amendment submissions and transfer requests to CDC.
- Reviewed grant notifications from Division of Sponsored Programs which involved use of select agents or toxins.
- Responded to CDC’s 2013/2014 inspection report, implemented program changes and trained BSL3 registered users as necessary.
Biological Safety Program Goals for FY16:

- Conduct annual laboratory audits of BSL2/3 laboratories with active rDNA protocols.
- Implement the new eIBC rDNA Registration Document Management System.
- Support Office of Animal Resources by providing biological assessment services for review of projects using pathogenic organisms with animals.
- Perform annual general and security inspection of the laboratories registered under 42 CFR 73.
- Perform an annual inspection of select agent toxins (exempt quantities) labs.
- Perform an annual drill/exercise at select agent facilities with emergency responders to test and evaluate the effectiveness of the three plans for each facility.
- Revise our select agent program, as necessary, to meet additional changes/expectations of the Select Agent Inspectors.
- Complete training for the new Associate Biological Safety Officer.
- Continue to work with OnSite to revise the BSC and Biological Inventory Modules to meet current needs.
- Perform annual suitability evaluation with the Suitability Assessment Review Committee.
- Create user manuals, navigations guides and other associated instructional documents for the eIBC Management System.
- Create and implement a program for the oversight of Dual Use Research of Concern.
- Create and implement a program to track CDC/USDA import permits and assist research staff with compliance.
- Create web-based documents to assist new Principal Investigators and research staff with meeting regulatory requirements and navigate University of Iowa programs.
- Create web-based documents to assist research staff in responding to a biological spill.
Chemical Safety Section

Chemical Hazard Assessment Program
This program provides services for monitoring chemical exposures and, where possible, applying the knowledge gained from these assessments to “similar” exposures in other areas of the institution. Services are also provided for assessing safe material handling practices and providing guidance on minimizing or eliminating exposures to hazardous chemicals.

Activities and Accomplishments for FY15:
• Numerous hazard assessments were conducted throughout the year to evaluate safe material handling, review chemical use with animals, and investigate individual or area concerns. Examples include assessments for the safe use of isofluorane, an anesthetic agent, or safe use and handling of a variety of items such as hydrogen fluoride, nicotine and antineoplastic drugs. The use of and disposal procedures for dioxin 2,3,7,8-tetrachlorodibenzodioxin were evaluated, as well as the procedure for the preparation of a nicotine compound.
• Numerous chemical hazard assessments were conducted in FY15; a significant number of these were conducted as part of the formal OAR ACURF Hazardous Agent Review process.
• Began using a tablet computer for conducting building audits, rather than an iPad.
• Created or revised SOPs for procedures such as: Using AutoCAD to create floor plans for the ER-RTK Report; overall creation of ER-RTK Report; and for the TIER II process, use of IDNR TIER II reporting software, and creation of TIER II reports.
• Provided emergency contact information for every building on each map to make it more user-friendly for emergency response personnel.
• Conducted chemical monitoring in several areas. The goal was to assess environmental conditions in labs and other spaces either related to personnel concerns or for chemical spill/incident investigations.
  o Samples were taken at two sites for sulfur dioxide.
  o Mercury concentration in air was measured by a direct reading instrument in two areas.
  o Toxic gases in air (including hydrogen sulfide, volatile organic carbon vapors and carbon monoxide) were measured by a direct reading instrument for two buildings.
  o Volatile organic vapors in air were measured by a direct reading instrument for one work area.

Chemical Inventory System
EHS has implemented a university-wide chemical inventory system using a web-based software program. The goal of this project is to have accurate inventory data online for research investigators in 116 departments and other chemical use areas. Implementation expanded to other campus areas where chemicals are used and stored. The inventory data are also available to emergency responders as needed.
Activities and Accomplishments for FY15:

- The chemical inventory system, OnSite’s Chemical Safety Assistant (EHSA), was used throughout FY15. The following is a breakdown of some EHSA data categories.
  - Number of chemical owners/PIs: 549
  - Number of total Users: 1607 #
  - Number of buildings: 169
  - Number of rooms: 2175
  - Number of inventory items: 163,782

# Total number of users includes labs, non-labs, 15 BET groups and 2 emergency responder groups

- Conducted a verification of research labs’ inventory account information (PIs, users, rooms) by contacting labs and updated account authorizations as needed.
- Contacted labs that were delinquent in updating their 60-Day Chemical Review Statement.
- Progress continued on assuring newly entered and existing chemicals listed in the chemical inventory also appear in the associated EHSA Chemical Inventory Catalog. This is necessary to ensure that all Department of Homeland Security’s Chemicals of Interest (DHS’s COI) chemicals and TIER II chemicals can be included when running the appropriate reports.
- Created multiple chemical inventory reports, including some in Excel format, for EHS internal use.

Laboratory Assessments

This program was developed for the purpose of supporting the UI’s research goals by promoting safe research and assuring sound laboratory safety, health and environmental management. This is accomplished by providing oversight of occupational and environmental safety programs with emphasis in the areas of biological, chemical, and radiation safety and waste management. As recommended by the University’s Internal Auditors, the program is also intended to implement a more comprehensive assessment of programs and practices within the research community. Each principal investigator’s (PI’s) research area is reviewed in order to build a comprehensive picture of laboratory research operations, assess the current status of their safety programs, and build additional resources to assist the research community in implementing best safety practices and compliance-based programs, such as those required by the University, state and/or federal regulations.

Activities and Accomplishments for FY15:

Safety Advisor Team (SAT) Accomplishments

- Provided direction on how the team would consistently assess and record findings on items from the lab review checklist. Provided technical guidance to address issues and concerns arising from the lab review process.
- Team meetings were periodically held to discuss unique lab review findings and subsequent resolution, where applicable.
- Provided training for three new safety advisors.
- The team was utilized to collect and disseminate information throughout the year.
- The safety advisors conducted 363 bio/chemical lab reviews. In addition, 19 new PI orientations were completed. The team also conducted radioactive materials user inspections for labs as described in the Radiation Safety Programs section of this report.
Sixty two (62) possible individual audit/review findings (areas that need improvement) were tracked for the bio/chemical lab reviews. In addition to being tracked individually, lab review findings were placed into eleven general categories and tracked to help correlate problems within general health and safety programs or areas. Of the eleven categories, the highest numbers of findings were in areas that included general lab safety, emergency preparedness, training, chemical management and personal protective equipment.

- Of the labs reviewed in FY15, the most common number of findings per review was zero (29%), followed by one (23%), and two (17%).
- 71% of the labs reviewed had one or more findings.
- The top three annual lab review findings were: ‘Incomplete training’, ‘PPE hazard assessment training not reviewed and signed by all staff’, and ‘the lab chemical inventory not reviewed or the chemical review statement not updated in the past sixty days’.

- Notable improvements in FY15 include:
  - 34.4% improvement in the category entitled ‘training records are incomplete or out-of-date’.
  - 37.5% improvement in the category entitled ‘hazardous waste container was found with a label pre-dated and not ready to be picked up by EHS’.
  - 11.1% improvement in the category entitled ‘Chemical Hygiene Plan is not accessible or has not been reviewed annually’ and 28.9% improvement in the category entitled ‘PPE Hazard Assessment Tool is not complete including annual certification and/or annual review by lab staff’.

- Notable trends toward improvement over four years (FY12 through FY15):
  - 10.6% improvement in ‘PPE HAT is not complete’
  - 15.4% improvement in ‘training is incomplete.’

Safety advisors actively followed-up on a specific set of lab findings (including training and documentation) to ensure the outstanding items were completed after the lab review. 87% of the labs completed all outstanding items found during lab review in FY15.

- The safety advisors conducted 374 Lab Safety Rounds (LSR), unannounced brief observation-only lab reviews.
- The top three LSR findings were ‘evidence of food or drink in lab area,’ ‘unlabeled containers,’ and ‘fume hood sash open when not in use.’

Mobile Inspection Development Activities (2015)

- Added a new inspection type for Orientation audits in EHSA.
- Added a review question pertaining to USDA/CDC Permits, edited the rDNA exemption question and deleted a review question pertaining to laboratory SOPs.
- Created an internal report to track deficiencies needing follow up and documentation for completion.
- Began using the EHSA database feature that allows advisors to enter deficiency completion dates.
- Updated the SOP for Safety Advisor Team users to reflect audit and database changes including training verification.
- Revised internal process for review of lab review results prior to issuing to labs.
- Implemented use of Training Needs Assessment and Training Deficiency Report.
- Retired excel spreadsheets for the tracking of audit deficiencies.
Laboratory Chemical Safety and Chemical Hygiene Program
This program applies to all laboratory chemical use under normal working conditions or during a foreseeable emergency. This includes approximately 50 major departments with labs in research, medical and academic activities.

Occupational Health & Safety Support for Research Grant Submissions
Beginning in 2001 the US Army Medical Research and Material Command (USAMRMC) required two safety submittals for grants: an institutional facility safety assurance which is completed by EHS, and a safety assurance from the principal investigator.

Activities and Accomplishments for FY15:
- Completed the annually required Facility Safety Plan Status report to USAMRMC; EHS provided site visits, follow-ups, and coordinated USAMRMC safety plan information for 11 UI investigators sponsored by USAMRMC or other DOD organizations.

Support and Services for Research Laboratory Contacts and Department Health and Safety Coordinators
EHS works directly with research laboratory investigators and their staff to provide consultation and assessment services, education, and laboratory site reviews to assess health and safety practices and compliance. EHS also provides support services to voluntary department personnel who serve as the primary administrative liaisons (coordinators) between EHS and their respective units. In addition, EHS provides general support services such as development of guidance documents or resource information to help researchers manage hazards in the laboratory.

Activities and Accomplishments for FY15:
- All chemical safety online training modules were reviewed/revised.
- Chemical safety resources added in FY15 included antineoplastic agents, a lab safety guidance document and an ICON training course for antineoplastic agents used in research labs.
- An overview of the Safety Advisor Team and the EHS research laboratory review program was added.
- Bimonthly Lab News articles were published on chemical safety topics.
- Provided chemical consultations and/or assessments for the research laboratory community upon request. Assisted with issues such as safe handling and controls for toxic or hazardous chemicals, review of lab experiment protocols for chemical safety issues, chemical reaction products related to safety and exposure, safe chemical segregation, grant application safety issues/questionnaires, formaldehyde use assessments, post-incident evaluations, chemical use in the Office of Animal Resources facilities, and moving lab chemicals.

Examples of issues for which support was provided for FY15 included:
- A Safety, Health and Waste Management program and process evaluation was completed for the State Hygienic Laboratories.
- Evaluated lab procedures in relation to use of pyrophoric chemicals in response laboratory fire caused by same.
Met with FM and research departments to set up criteria to determine fume hood repair status and individual fume hood repair priorities.

Set up a fume hood repair web site that allows labs and departments to determine the status of fume hood repairs and retesting.

Several meetings were held by AirCuity to explain and demonstrate the air testing system in PBDB. EHS worked with them to determine the how to interpret the data from this monitoring and how to respond if/when issues arise.

Annual fume hood testing was moved from a twelve month to a ten month testing cycle running from February to November. This two month gap will allow the annual fume hood reports to be completed more efficiently.

All persons on the annual fume hood report list were contacted to determine if they still wished to receive a fume hood report. This will reduce the number in the future from 20 different reports to approximately six.

Chemical safety and management issues were reviewed in 363 labs as a part of the annual biological/chemical lab review process. Chemical safety issues were also reviewed during Lab Safety Rounds unannounced walk-throughs.

- Provided lab and waste regulation training to incoming grad students from the following departments: Chemistry, Biology and Biochemical Engineering. Developed a detailed custom training module for one PI’s research laboratory.

Respiratory Protection Program for Laboratories
Implement a Respiratory Protection Program in research laboratories where respirators are available for use. See the Respiratory Protection Program report section for additional information.

Activities and Accomplishments for FY14:
- Approximately 13 new lab respirator use evaluations were completed in FY15. As of the date of this annual report, EHS records show there are approximately 194 respirator use labs.
- The status of respirator use in labs was tracked with the EHS bio/chemical lab reviews and lab walkthroughs. Labs were assisted with the following respirator use issues: storage, reuse, and disposal; use of single strap dust masks or the masks that are not approved by NIOSH; the use of surgical masks for handling chemical/biochemical powders.
- Respirator fit testing was conducted for three work areas.

Personal Protective Clothing and Equipment (PPE) Program for Laboratories
This program is a component of the overall PPE Program and includes departments with research laboratories where PPE is used for hazard protection.

Activities and Accomplishments for FY15:
- Assisted investigators with completing the written PPE hazard assessment form and certification, whenever needed. The EHS Safety Advisors and chemical safety staff provides support for the PPE program in research labs. Safety advisors reviewed PPE hazard assessment and training documents during each EHS bio/chemical lab review.
- Chemical safety section staff provided personal consultations, coaching and education for individual laboratories on:
o Cuts, punctures, and piercings while handling glass apparatus or razors.
  o Splash from phenol-chloroform reaction mixtures, splattering from electrophoresis gels.
  o Glove disposal issues related to improving safety at unattended chemical use benches and computer stations.
  o Improving storage of lab coats to minimize exposure to contaminants.
  o Improving the types of gloves worn for a specific purpose (e.g., cut resistant gloves or thermal resistant gloves).
  o Improving the use of safety glasses or goggles, especially while working with liquids.
• PPE use was routinely reviewed or recommended as part of several hazard evaluations, spill consultations, and post-incident follow-ups.

Ventilation and Fume Hood Program
This program focuses on the fume hood as the major engineering control for chemicals used in laboratories. Annual airflow performance checks are performed on chemical fume hoods to assess inflow velocities. Results are communicated to users, departments, and Facilities Management. Support is provided to Research and Facilities Management (FM) for laboratory ventilation issues pertaining to new installations and renovations.

Activities and Accomplishments for FY15:
Fume Hood Program
   • The annual test cycle was rearranged from a 12-month rotation into a 10-month rotation to better accommodate EHS retest needs and annual fume hood report generation.
   • The annual test cycle of all fume hoods on campus was completed and the report was issued in January 2015 to 20 departments and colleges, as well as to FM the Hygienic Lab and UIHC.
   • 941 hoods were visited, with 881 chemical fume hoods measured for hood face velocity:
     o 810 hoods passed
     o 53 hoods were designated for restricted use only
     o 18 hoods failed
   • Two hundred and six (206) referrals were made to maintenance (FM Work Control Center and UIHC) for issues such as failed hoods or other airflow problems (including repeat referrals), problems with lights, baffles, sashes or monitors.
   • Smoke tests were performed on approximately every 5th conventional-type hood and each low flow high performance hood.
   • Fume hoods were assessed throughout the year upon request or were re-assessed following notification that maintenance was complete.
   • A series of meetings were conducted with representatives of FM and COM to re-assess the flow of information regarding hoods needing maintenance.
   • The Fume Hood Maintenance List website was launched in December 2014.
   • Student use of the Apple IPad was discontinued. It was replaced by a Samsung Tablet with much more favorable results.
**Research and Facilities Management Project Support**

The Chemical Safety section continued to provide support to both FM and Research staff for various projects. The majority of projects involve management of air flow in laboratories and, in particular, methods to reduce air exchange rates in labs to control cost or to directly reduce cost by managing the cost of conditioning lab air. The following projects were supported:

- PBDB Aircuity work group.
- Fume hood presence sensor and sash position
- CB implement energy conservation measures
- ML facility energy study
- PBDB use of red emergency purge button by lab personnel
- Movement of flammable liquids into PBDB labs
- Assessment for reduced lab ventilation in unoccupied labs

**Materials Management - Regulatory Reporting**

The Tier II and Emergency Response Right-To-Know (ERRTK) reports on hazardous materials locations within the institution are required to be submitted annually. EHS produces the reports and distributes them to the appropriate agencies. There are also reporting requirements for DHS Chemical Security Anti-Terrorism Standards for COIs.

**Activities and Accomplishments for FY15:**

**ER-RTK**

- RTK Report was completed and distributed to appropriate UI, local and state emergency authorities. AutoCAD files (in PDF format) are stored on a local drive for access by EHS personnel and transferred to thumb drives for non-UI emergency personnel. As building floor plans/maps were updated by Design & Construction (D&C), they were incorporated into the ER-RTK information collection. Examples of changes include building names and numbers as well as building addresses.
- The table below represents numbers for the ER-RTK effort for FY 2015.
A total of 768 floor plans were updated for the ER-RTK 2015 Report. 246 new floor plans were formatted for the ER-RTK 2014 report and 297 cover pages were updated for each building.

Additionally, 342 buildings and 768 floor plans were created as PDFs for internal and emergency responders’ use. Flash drives were used to deliver the PDFs to UI personnel and local fire departments and emergency responders.

A total of 211 buildings were audited.

The ERRTK improvement process for 2015 included:

- Discontinued use of the Apple iPad. A Samsung Tablet was used for all in the field inspections and map updates. ER-RTK map information as well as chemical inventory system and the Tier II report data were compared to assure they match as much as possible.
  - Areas with inventories in the EHSA system but not marked as hazardous materials areas on ERRTK maps were identified. These rooms were then inspected to determine if they met the criteria to be designated as hazardous areas on the ER-RTK maps.
  - Areas identified as hazardous material areas on ER-RTK maps were then checked against the chemical inventory system to locate areas that may not be listed in the inventory, although chemicals were stored there.

**Tier II**

- Completed the Tier II report; copies were provided to local, county and state emergency and disaster service organizations.
- Information from the chemical inventory system was used to verify locations and amounts listed in the Tier II inventories; The ER-RTK report data were also used for Tier II preparation.

### Updated In AutoCAD

<table>
<thead>
<tr>
<th>Updated In AutoCAD</th>
<th># Buildings</th>
<th># Floor Plans</th>
<th># New Maps</th>
</tr>
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<tbody>
<tr>
<td>East Campus</td>
<td>81</td>
<td>160</td>
<td>125</td>
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<tr>
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<td>8</td>
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<td>11</td>
</tr>
<tr>
<td>Off Campus Muscatine</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>New Buildings</td>
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</tr>
<tr>
<td>Residence</td>
<td>9</td>
<td>21</td>
<td>31</td>
</tr>
<tr>
<td>University Research Park</td>
<td>35</td>
<td>65</td>
<td>1</td>
</tr>
<tr>
<td>West Campus</td>
<td>81</td>
<td>419</td>
<td>47</td>
</tr>
<tr>
<td><strong>TOTALS for ER-RTK AutoCAD</strong></td>
<td><strong>277</strong></td>
<td><strong>768</strong></td>
<td><strong>246</strong></td>
</tr>
</tbody>
</table>
• DNR changed the online system for entering Tier II reports. This necessitated becoming proficient with the new system to ensure all UI data successfully transferred into the new system.

• Thirty-seven Tier II reports were filed in FY15.

• There are currently 98 active participants who routinely provide updated chemical data for Tier II reporting with 86 chemicals in reportable quantities.

• Changes were made to the completed Tier II reports per Elonda Bacon of IDNR. This request was made to reflect changes in the Tier II reports documentation regarding Risk Management Plans for water plant areas and storage areas.

• The Tier II reporting process includes:
  Verification of accurate chemical inventory quantities, storage container types and storage locations/periods from relevant participants across the UI campus; querying the UI chemical inventory database to identify all chemicals meeting certain criteria above regulatory reporting thresholds; data were extracted from the chemical inventory to create an Excel spreadsheet in which chemicals could be summed and physical property data for chemicals could be entered to allow calculation of final quantities in pounds. Data were ultimately entered into an online regulatory agency-provided reporting tool.

DHS Chemical Facility Anti-Terrorism Standards (CFATS)

• Utilized the chemical inventory system as the primary compliance tool for this regulation. Worked with users to maintain and update the chemical inventory and track any change in amount of COIs at the University.
  o Maintained a listserv of chemical owners/users. The listserv functions as a means to regularly distribute reminders to chemical owners to update their chemical inventories every 60 days. The 60-day periodic updates allow us to report, when required, within the regulation’s 60-day reporting window. Currently, there are 1249 (this number has remained steady since FY 2012) individuals in the listserv.

• Improved search efficiency in chemical inventory system for DHS-listed COIs.
  o Continued using the vendor-created DHS 60-Day Report which tracks 325 DHS regulated chemicals. The report sums COIs present in the EHSA system by building and by PI. It is estimated that over 2800 COI chemicals are tracked every 60-days.
  o Work continues to ensure the reliability of the report through spot checks on COI amounts in the report and those seen in inventory. EHS personnel continue to work with the vendor to correct errors in the programming and data tables.

• No material was determined to exceed a threshold reportable quantity in FY15. Chemicals that will trigger reporting upon shipment were identified and issues surrounding shipping of these materials were discussed with chemical owners.

Emergency Preparedness

This program is intended to improve hazardous materials management practices and emergency preparedness for departments and assess the expanded use of the Emergency Preparedness Plan (EPP) for a broad range of incidents. EHS works with volunteer building occupants to establish and maintain Building Emergency Teams (BETs) who can coordinate building and response issues related to incidents involving hazardous materials.
Activities and Accomplishments for FY15:
- To date, 15 Building Emergency Teams, representing 21 campus buildings, have been established.
- Worked with individual BETs throughout the year, as issues arose.
- Individual meetings were held with BETs to review the past year’s incidents, discuss learning opportunities, and promote idea sharing.

University Spill Resource (USR) Group
The University Spill Resource Program (USR) was instituted in 1993 to be a resource unit and provide coherent support services within the University’s Emergency Preparedness Program. The nine members of the Spill Resource Group provide consultation and advice to spillers on safe and appropriate response actions. Additionally, the Department of Public Safety (DPS), the Iowa City Fire Department and Johnson County HAZMAT Team provide campus emergency response services.

Activities and Accomplishments for FY15:
- Administration of the spill resource group was maintained, e.g., written guides, appropriate levels of equipment and supplies, and annual refresher training.
- Spill resource members provided consultation services for 17 campus incidents/inquiries.
  - Nine incidents involved chemical spills, including two with mercury, and one incident for each of the following substances: oil, an ethidium bromide aqueous solution, a formalin solution, AntiStat Film Cleaner, a lead acid battery, a mixture of diesel/water/fuel and a water/paint mixture.
  - Two of the incidents involved odors; one odor traveled from off-site along a sewer line into the building; one was one to chemicals being used illegally in a dorm room.
  - Two incidents involved leaks, in separate buildings of the same chemical in a water purification system.
  - Three of the incidents involved fires; one from a pyrophoric chemical improperly disposed of, one from the heating of oil in a toaster oven not designed for chemical use and one from the drying of a non-heat resistant plastic tray.
  - One incident was a high particle count identified by the AirCuity system in PBDB.
  - Eight of the incidents involved research laboratories, four incidents involved FM areas of buildings, two incidents occurred on docks, one incident involved a dorm room, one incident involved a UIHC building and one incident involved a construction site.
  - DPS was involved in six of the incidents.
  - ICFD/JCHMT was involved in six of the incidents.
  - UIHC S&S was involved in one incident.
  - The IDNR was notified of a potential release in three incidents.
- EHS maintained and revised Resource Unit Contact Information provided to DPS.
- Continued to foster lab management of spills by reviewing lab preparedness supplies and sharing guidance and information on spill preparedness during the annual lab reviews.
- Spill resource group members completed an eight-hour online HAZWOPER refresher training through Safety Unlimited, Inc.
Chemical Safety Section Goals for FY16:

- Provide support for the further implementation of mobile lab auditing and lab web access to inspection information.
- Continue to use the EHSA inventory system to remain compliance with DHS COI reporting requirements. Monitor the EHSA system to ensure accuracy.
- Continue to improve the quality of chemical inventory data entered by researchers through EHS administrative methods. Data are reviewed to assure it appears in or matches chemical information in the associated chemical catalog. This allows capture of materials when searches are conducted and/or regulatory reports generated that might otherwise be missed due to spelling or other entry errors.
- Continue to support the laboratory ventilation and energy reduction projects initiated by FM.
  - Support the energy reduction goals for FM in labs by contributing EHS reviews of lab hazard material use in selected labs to determine if ventilation rate reductions can be safely implemented.
  - Periodically monitor the demand-controlled ventilation data dashboard for a new research building to gain a better understanding of volatile chemical and particulate concentrations in air during routine research activities as well as during accidental/non-routine upsets.
- Transition maintenance of BET program to Safety Specialist. Incorporate PBDB into an established Carver College of Medicine Building Emergency Team when the building is occupied. Building occupants will be contacted to determine new team members and one to two spill carts will be located in the building.
- Inspect all of the University buildings including those purchased or leased in FY15-16.
  - Train Safety Specialist to conduct inspections of university buildings for 2016 RTK report.
  - Review each building map/floor plan available from FM for changes prior to conducting physical audits of buildings for 2016 RTK Report.
- Conduct site reviews for USAMRMC-funded principal investigators; submit annual Facility Safety Plan Status report to USAMRMC.
- In support of the animal care and use review process, provide chemical assessment services for review of projects using hazardous chemicals with animals.

Laboratory Assessments/ Safety Advisor Team Goals for FY16:

- Continue to develop and refine the mobile auditing process for the laboratories.
- Complete Biological, Radiation and Chemical internship for new field safety advisors.
- Initiate training of the new Biological Safety Specialist and the new Chemical Safety Specialist, who will serve as members of the safety advisor team.
- Initiate training of the new Associate Biosafety Officer to serve as the primary trainer for safety advisors and to review post-audit reports for the biological safety section.
- Continue unscheduled lab visits (Lab Safety Rounds) to improve lab follow-ups and to create opportunities to interface with researchers and answer their questions.
- Continue building the website for audit preparation and follow up capabilities.
- Investigate training opportunities for SAT leaders (CSHEMA conference, etc.)
- Complete applicable training opportunities as they become available.
Environmental Programs Section

The Environmental Programs Section is responsible for facilitating compliance with pertinent environmental regulations by managing biological, chemical, and radioactive wastes, conducting waste generator compliance assessments, facility inspections and audits, institutional waste generation and minimization assessments, and annual reporting to the Environmental Protection Agency of these compliance-based activities. Environmental programs are focused on two areas: operational and compliance.

Summary of Major Environmental Program Initiatives

- Completed review and updated the EHS Health & Safety Plan.
- The Environmental Section’s recycling program, recycled 775 gallons of used oil; 689 lead-acid batteries weighing 5,969 lbs; 3,237 other hazardous batteries weighing 989 lbs; and 600 pieces of lead shielding weighing 1,368 lbs.
- The Environmental Section’s DEA Controlled Substance destruction program properly disposed of 105 containers of controlled substances.

Operational Programs

Hazardous, Radioactive, and Biohazardous Waste Management Programs

These programs cover requirements that are imposed on the University by federal and state regulations, and the conditions imposed on the University in order to operate a permitted treatment, storage and disposal facility (TSDF) on the University of Iowa Research Park campus. Program activities are defined and regulated by the following agencies: U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), Iowa Department of Public Health-Bureau of Radiological Health (IDPH-BRH), Iowa Department of Natural Resources (DNR), Iowa Occupational Health & Safety Administration (IOSH).

Waste Collection, Container Tracking, Transportation and Storage

Hazardous waste chemicals are identified, inventoried, collected and transported to the University of Iowa Research Park for processing and storage prior to contractor collection and disposal. EPA prohibits the entry of unknowns into a TSDF. For unknown chemicals, a chemical analysis service is offered to clients that will then allow the identified chemical to be entered into the waste management system. In addition, EHS facilitates the management of unstable and/or explosives by contracting with a high hazard technical team that stabilizes and deactivates such chemicals.

Radioactive wastes are collected from University research operations and UIHC patient treatment areas. The wastes are transported to the University of Iowa Research Park for processing, decay in storage, and storage prior to contractor collection and disposal.
Biohazardous waste collection is managed by EHS as follows:

- EHS oversees contractor collection and disposal of wastes generated at major UI research, academic and support facilities (~10-15 areas).
- EHS collects waste from the remaining facilities and subsequently disposes of those through contractor collection. EHS does not participate in the collection and management of biohazardous waste generated at University of Iowa Hospitals & Clinics, but does manage and oversee the vendor contract for this service.

**Activities and Accomplishments for FY15:**

- Hazardous chemical waste: a total of 26,704 containers were collected from 726 waste generators during 3,612 visits. Waste amounts varied in size from a few milligrams to 55 gallons.
- Radioactive waste: a total of 824 containers were collected from 82 waste generator sites during 214 visits. Waste consisted of liquids, solids, and patient therapy waste.
- Biohazardous waste: a total of 22,450 containers were collected (excludes waste generated at UIHC); 20,657 collected by contractor; 1,793 collected by EHS.
- Unknown analysis: 51 unknowns from 23 locations were analyzed and identified.
- Cleanouts: completed 73 laboratory cleanouts generating 7,052 items of hazardous chemical waste.
- See attachments for statistical and graphical information.

**Waste Processing, Contractor Shipment and Disposal Activities**

Hazardous chemical waste collected throughout the University is transported to the Environmental Management Facility (EMF) located at the University of Iowa Research Park and stored prior to processing, recycling, treating, or disposal. Chemicals are disposed of through a contractor who received a single contract covering both labpack and bulk disposal. The contract is a Board of Regents coordinated, cooperative contract that includes the University of Northern Iowa, Iowa State University (ISU) and the University of Iowa (UI). The contract is issued through ISU and UI and reviewed by the Risk Management Department with input from the section manager.

Radioactive waste is intensively micro-managed through the segregation of wastes into 45 separate streams and subsequent processing to achieve maximum cost savings. The foundation of radioactive waste management is decay-in-storage. This technique is used to reduce the amount of radioactivity contaminating a particular waste stream to background levels.

**Activities and Accomplishments for FY15:**

**Hazardous Chemical Waste**

- Processing:
  - Bulking – 6,420 items were commingled together into 365 drums last fiscal year.
  - Recyling – 775 gallons used oil; 689 lead-acid batteries weighing 5,969 lbs; 3,237 other hazardous batteries weighing 989 lbs, and 600 pieces of lead shielding weighing 1,368 lbs.
  - DEA Controlled Substance destruction – 118 containers of controlled substances were disposed of through a DEA-approved method and completing the required reports.
Waste processing generates a large amount of regular trash to be disposed of at a landfill. Last year 26 truckloads containing such waste were taken to the Iowa City Landfill.

**Other:**

<table>
<thead>
<tr>
<th>Process</th>
<th>FY13 Weight (kg)</th>
<th>FY13 Items</th>
<th>FY14 Weight (kg)</th>
<th>FY14 Items</th>
<th>FY15 Weight (kg)</th>
<th>FY15 Items</th>
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</thead>
<tbody>
<tr>
<td>Neutralization</td>
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<td>648</td>
<td>1,138</td>
<td>1,203</td>
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<tr>
<td>Non-hazardous Gases Vented</td>
<td>111</td>
<td>22</td>
<td>148</td>
<td>15</td>
<td>92</td>
<td>57</td>
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<tr>
<td>Non-hazardous-to IC Landfill</td>
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<td>1,273</td>
<td>1,584</td>
<td>928</td>
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<tr>
<td>Sewered</td>
<td>6,237</td>
<td>2,924</td>
<td>6,753</td>
<td>3,790</td>
<td>4282</td>
<td>2,783</td>
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</table>

**Cost Containment:**
Labpacks are a considerably more expensive disposal option, but are necessary due to extenuating factors such as chemical compatibility, stability, or EPA-mandated treatment methods. Because of their high cost [bulk solvents cost $0.59/kilogram (kg), labpacks cost $15.11/kg], EHS makes every effort to minimize the number of labpacks that are created. Last year 132 labpack drums were filled with 4,566 items weighing 2,064 kg.

**Contractor Shipments and Disposal:**
- Twelve shipments of hazardous chemical waste were completed and sent to off-site EPA permitted facilities.
- Three mixed waste (chemical and radioactive hazards) shipment of 4 drums.
- Twelve barrel/labpack shipments totaled 557 drums.

**See attachments for statistical and graphical information.**

**Radioactive Waste**
- Saved approximately $8,200 in contractor disposal costs by using labor-intensive practices to process radioactive waste.
- Aqueous liquids are held for varying periods of isotope-dependent decay times prior to being discharged to the sanitary sewer. Last year 142 containers in 4 drums along with 45 individual smaller containers were discharged for a total of 279 gallons.
- Mixed wastes are stored on shelves, allowed to decay, surveyed, reclassified as hazardous waste, and then disposed of through the hazardous waste program. This reduces the toxicity of the waste, eliminates the “mixed waste” classification and affords a large cost savings. Last year 10 containers of mixed waste were released after decay-in-storage.
- Lead shielding is surveyed for contamination and recycled through the hazardous waste program if no contamination is present. Last year 480 pieces were collected.
- Refuse is created during the extensive processing of RWMP, which is disposed of through landfilling. Last year 26 truckloads of such waste were taken to the Iowa City Landfill.
- A sorting station is used to sort dry waste for review and removal, if necessary, of inappropriate items prior to disposal in the Iowa City Landfill. Last year no drums of short-lived waste were processed; several will become available for processing in FY16.
• A compactor is used to compact short-lived dry waste to minimize storage space prior to being sorted; 22 drums of dry waste were filled and compacted to reduce the volume of waste being stored until it is ready for sorting, etc.

• Completed two radioactive waste shipments of 35 shipping containers, including:
  o 1 – Bactec vials;
  o 1 – dry waste barrel;
  o 1 – hazardous scintillation cocktail vial;
  o 2 – mixed hazardous/radioactive liquids;
  o 1 – contaminated lead shielding;
  o 22 – non-hazardous scintillation cocktail vials;
  o 5 – dry waste in yard-boxes, and
  o 2 – sharps in a yard box.

• See attachments for statistical and graphical information.

Biohazardous Waste
• Operated the program that manages biohazardous waste, excluding waste generated by UIHC, which operates a separate program.

• Established procedures in which a vendor collects waste from dock areas at twelve buildings that are large quantity generators; EHS collects waste from twelve small quantity generators.

• Disposed of 22,450 containers of waste (excludes waste generated at UIHC); 20,657 collected by contractor; 1,793 collected by EHS.

Monitoring Activities
The radioactive waste management program performs significant internal monitoring directed toward contamination control, environmental monitoring, and personal dosimetry.

Activities and Accomplishments for FY15:
• Surveys - more than 8,000 surveys are performed annually.
  o Vehicle – surveyed after each use – 103 times – using 1,030 wipes.
  o Facility – surveyed on a weekly basis – 52 surveys – using > 1,500 wipes.
  o Containers – surveyed > 800.
  o Lead shielding – surveyed prior to disposal – 600 pieces.

• Environmental dosimeters – no significant doses were released in the facility operations.

Quality Assurance Activities
The waste section maintains an extensive quality assurance program regarding waste records and waste section practices. Audits are conducted to ensure the accuracy and completeness of generated records used for tracking wastes from generator to final disposal.

Activities and Accomplishments for FY15:
• Daily review of data collected during waste collections; ongoing record audits.
• Periodic review of drum contents for quality assurance and annual barrel record review.
• Weekly review of individual storage location contents and periodic inventory checks.
• Quarterly self-RCRA inspections.
• Barrel check and item inventory checks after every waste shipment.
• Reviewed drum contents for quality assurance.

**Regulatory Compliance Programs**

**Environmental Reporting/Permit Management**
The Environmental Section manages a permitted TSDF that allows the University to store hazardous waste at several locations on the University of Iowa Research Park campus. This permit dictates an extensive recordkeeping network of information that documents the condition of the facilities and allows EHS to track each container of waste from a specific generating site within the University to the ultimate disposal site. Information from generators, transportation manifests, in-house storage records, packaging and container information, contractor transportation records, and contractor disposal records are merged into an operating record. The operating record is the basis of assessing compliance with applicable regulations. This program includes submitting required regulatory reports to the appropriate agencies.

The University of Iowa’s TSD operating permit also requires a Waste Minimization Plan focused on reducing generation and subsequent release to the environment of the most persistent, bioaccumulative and toxic constituents in hazardous wastes. The plan’s three inherent goals are to reduce the most hazardous substances, avoid transferring these constituents across environmental media, and ensure these constituents are reduced at their source.

**Activities and Accomplishments for FY15:**
• Completed annual EPA report, as required by our EPA operating permit. EHS is required to submit an “Annual Report to EPA on the Status of Waste Reduction Techniques” and a signed Certification that a program is in place.
• Performed the following waste minimization activities:
  o Conducted regular solicitation of waste coordinators at each generator site.
  o Performed waste segregation and micro-management.
  o Conducted waste training and education activities.
  o Performed waste generator assessments, which allowed direct one-on-one communication with generators. To date, thirty one different waste minimization techniques are in use.
  o Micro-managed the bulk fluid portion of the waste stream to allow fuel-blending as the preferred method for disposal. Fuel-blending allows recovery of the heat value from the waste.
  o Generated an annual historical summary of waste disposal costs and submitted it to the Associate Vice President for Research, Regulatory Affairs.
  o Generated graphical information on waste minimization of liquid scintillation cocktail, mixed waste, benzene, chromic acid, and lead shielding for the Annual Report to EPA on the Status of Waste Reduction.

**EPA Compliance**
The EPA Compliance Program is intended to promote compliance with select environmental programs. The program consists of participating in regulatory agency inspections, conducting
waste generator assessments, and managing a Safety Data Sheets (SDS) inventory used for conducting hazardous waste determinations. The purpose of waste generator assessment/audits is to evaluate waste generator sites, confirm generator identity, identify waste generating processes, evaluate regulatory compliance, promote waste minimization efforts, disseminate information on new methods and technology to reduce waste, promote disposal of unwanted chemicals and proper chemical management. The audit program focuses on large quantity generators, groups targeted by EPA for inspection, and generators with disposal issues that have been identified during waste collection.

Activities and Accomplishments for FY15:
- Completed response to EPA for the results of the compliance evaluation inspections conducted by EPA between April 28, 2014 and May 1, 2014. Four separate inspections covered the permitted waste storage facilities, and waste generators on the UI Research Campus; the UI Main Campus; Studio Arts; and the Mossman Business Services Building. EPA has accepted the response and considers the results complete.
- The Iowa Department of Public Health conducted an inspection of the facility during the last fiscal year as part of the University’s annual radioactive materials license inspection. No violations were identified.
- Continued the implementation of programs to perform audits or assessments for select areas that generate hazardous waste. Audits are alternated between lab and non-lab areas.
  - Completed 394 audits of laboratories that generate hazardous waste.
  - Completed 206 audits of non-laboratory areas that generate hazardous waste.
  - Completed 195 audits of areas where Universal Waste is accumulated.
- SDS solicitations: over 1,000 SDS were solicited from manufacturers; currently, over 19,000 separate SDS are part of the EHS’s collection of this information.

Goals and Initiatives for FY16:
- Facility operations: receive no violations from EPA; complete quarterly self-RCRA inspections.
- Conduct additional spill exercises that implement use of an SCBA.
- Conduct facility reviews for local emergency personnel.
- Review and update Environmental Programs Sections Health and Safety Program.
- Complete and submit the biennial hazardous waste report for EPA.
- Complete training for new staff.
Occupational Safety Section

The Occupational Safety (OS) section is committed to the promotion of a safe and healthy workplace for University of Iowa (UI) faculty, staff, and students through the development and implementation of programs and procedures to minimize occupational hazards.

The Occupational Safety Section provides services to a broad range of departments and staff on campus. Its focus is on people and how they interact within their workplace in regard to occupational safety and health. The programs and services are designed to evaluate job hazards, help individuals and departments reduce or eliminate these hazards, and comply with state and federal occupational safety and health regulations. The OS section provides campus-wide oversight for the following programs:

- Support for the University of Iowa Hospital and Clinics (UIHC) and the UI Department of Human Resources (HR) by partnering with the Iowa Occupational Safety and Health Administration (IOSH) during routine or incident based inquiries and inspections
- Occupational Safety Programs such as Machine Guarding, Personal Protective Equipment, etc., Illness and Injury Prevention
- Industrial Hygiene Programs such as Indoor Environmental Quality, Respiratory Protection, Hearing Conservation, etc.
- Exposure Assessment and Maintenance of Exposure Records

Upon request, additional services may be provided for the UIHC and include industrial hygiene exposure assessments, indoor environmental quality investigations, and subcommittee work associated with the Environment of Care Committee. Such services are coordinated through the UIHC Safety and Security Office.

Administrative Audits.
The purpose of the OS administrative audit is to look at the major occupational safety and health topics associated with a unit or department, and to ensure that controls are in place to eliminate or reduce risk. The OS auditor initiates contact by sending a flow chart that explains the audit process to the unit or department and also schedules an onsite visit. The audit consists of a review of written programs, training documents, injury reviews, and a walkthrough of the area. Once this is complete a letter containing the results is sent to the department. Unless otherwise noted, the standard time-frame for completion of all identified items is 30 days from the receipt of the letter. The auditor then schedules a 30 day follow-up visit to review progress on these items. If anything is still open at that time, the auditor will schedule a 45 day final follow-up to determine the status. It is the goal that all identified items will be completed and closed at the end of this 45 day time-frame. A final letter is sent to the department and director summarizing the findings at the end of this process.

Activities & Accomplishments for FY15

During fiscal year 2015, the OS section conducted eighty seven (87) departmental reviews. All units were reviewed for compliance with the following Iowa Occupational Safety and Health (IOSH) and National Fire Protection Agency (NFPA) standards. These include:
- Personal Protective Equipment
- Machine Guarding
- Electrical Safety
- Control of Hazardous Energy - Lockout/Tagout
- Flammable and Combustible Storage and Compressed Gas Cylinders
- Hazard Communication
- Hot Work
- Bloodborne Pathogens
- Cranes and Hoists
- Theater Rigging
- Hearing Conservation
- Powered Industrial Trucks (Fork Trucks)
- Aerial Booms and Scissor Lifts
- Asbestos Awareness
- Hazardous Waste
- Emergency Preparedness and Access/Egress
- Housekeeping- Facility Cleanliness and Organization
- Walking/Working Surfaces
- Fall Protection
Hazard Communication Program Updates
The Occupational Safety & Health Administration (OSHA) substantially revised the Chemical Hazard Communication standard through the adoption of the Global Harmonization System (GHS) of classifying and labeling chemicals. In response to the new standard, the OS section reviewed University practices to revise the existing programs, guidelines, and course offerings. The revision criteria were phased into department reviews and audits in concert with regulatory deadlines for implementation. 2015 HazCom program updates included:

- Updating the University Written HazCom program to incorporate all GHS guidelines;
- Providing departments with templates so that they can customize the program for their needs; and
- Working with the University Printing Office to develop a process so that departments can order GHS compliant secondary labels.

Hot Work
The OS section worked with a committee comprised of representatives from Risk Management, Public Safety, and Facilities Management to update the UI written Hot Work Program. This was initially identified as an issue when OS met with the UI insurance carrier FM Global. Some of the key program updates include:

- Clearly defining roles, responsibilities, and procedures for both UI employees and outside contractors in regards to both “Fixed” and “Temporary” Hot Work sites
- Updated the Hot Work Permit form and procedures to obtain and use it
- Outlined training, audit, and compliance procedures

Training
Occupational Safety online training courses are offered by EHS for thirty-one (31) topics. These programs are reviewed on an annual basis and updated as needed.

Students Working With Machinery & Equipment
The Occupational Safety & Health Administration (OSHA) regulates the use of machinery, equipment, and mechanical power transmission apparatuses that are currently used in maintenance operations, machine, and repair shops. In some departments within the University, it is common for students, as well as faculty and staff, to use equipment of this sort including metal and wood turning lathes, band saws, drill presses, radial arm saws, and floor mounted grinders. This program covers departmental areas and activities in which students use large industrial powered equipment as part of professor-led academic class projects.

If students are allowed to use the equipment the following guidelines must be adhered to by the department:

Training.
Students are trained on the use of powered equipment, which includes:

a) Completing an ICON training course on general machine safety.

b) Site-specific training that includes discussion of departmental shop rules & procedures, and machine or equipment-specific training.
Supervision.
   While the equipment is in use by students, supervision is provided at all times by an employee who has knowledge and experience with the equipment.

Personal Protective Equipment (PPE).
   Proper PPE is worn. No dangling jewelry is allowed. Long hair must be tied back/restrained so that it cannot get pulled into equipment.

Activities & Accomplishments for FY 15:
A total of 10 areas were audited that allowed students to work with machinery and equipment. These areas spanned the following 4 colleges and departments: School of Art, College of Engineering, Division of Performing Arts, and Physics and Astronomy. When necessary, follow-ups were performed to ensure that all items covered in the audit were in compliance with safety requirements.

Safety Processes, Collaborations, Regulatory Inspections
University-wide procedures have been put in place to provide a more consistent institutional response to potential health and safety issues raised by OSHA and to implement timely action to ensure a safe environment for employees. The safety and regulatory inspection processes are managed by the OS section and include management systems that increase the effectiveness of departmental processes and committee collaborations to identify and control risks.

Activities and Accomplishments for FY15:
The OS section participated in the following University and UIHC department committees:

- The UI Pharmaceuticals Safety Committee
- The College of Dentistry Nitrous Oxide Oversight Committee
- UIHC Staff Safety & Health Council
- The Workplace Occupational Safety and Health Work Group

In addition, the OS section maintained Occupational Safety and Industrial Hygiene web publications for the campus covering twenty-seven (27) regulatory areas and online courses.

Injury and Illness Analysis
The OS section investigates injuries and illnesses that occur at the University in order to reduce the potential for similar recurrences in the future, the number of injuries and illnesses that occur, and to limit the severity of these incidents. The Injury and Illness Analysis program includes review and tracking of the First Report of Injury (FROI) claims submitted through the central HR database. The claims are classified due to the mechanism of injury, outcome, and the department in which they have occurred. During administrative reviews, the OS section provides each department with reports of the OSHA recordable incidents occurring in their department and conducts an analysis with a focus on addressing loss control activities.
Activities and Accomplishments for FY15:

Incident investigation form and training. The OS section has been working with a sub-committee from the Workplace Occupational Safety and Health Work Group to design an incident investigation form and ICON training course that will be used across campus. There are a variety of different forms currently being used throughout campus. The new process will enable us to bring consistency and uniformity to our incident investigation process. The ultimate goal of the investigation process is to identify corrective actions and help lower our incident rate over time.

In addition, the OS section reviewed 1576 First Report of Injury (FROI) reports for accident type classification filed by University employees through the University HR injury reporting and workers compensation system.

Listed below is a comparison of the most frequently reported types of injuries by UI employees (excluding UIHC) by year:

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slip, Trip, or Fall</td>
<td>117</td>
<td>179</td>
<td>152</td>
<td>90</td>
</tr>
<tr>
<td>Exertion</td>
<td>115</td>
<td>120</td>
<td>126</td>
<td>73</td>
</tr>
<tr>
<td>Exposure To</td>
<td>43</td>
<td>42</td>
<td>65</td>
<td>34</td>
</tr>
<tr>
<td>Cut or Pierce</td>
<td>69</td>
<td>91</td>
<td>61</td>
<td>43</td>
</tr>
<tr>
<td>Struck By</td>
<td>31</td>
<td>49</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Hit Against</td>
<td>29</td>
<td>31</td>
<td>34</td>
<td>20</td>
</tr>
</tbody>
</table>

The OS section reviews the number of OSHA recordable injuries by fiscal year in comparison to the number of recordable injuries with lost time only. These comparisons allow for the...
identification of trends in time and severity as well as a measure of the effectiveness of the current safety programs. The next four graphs show OSHA recordable cases for University employees, including vs. excluding UIHC employees.

**Figure 2: OSHA Recordable Injuries, Total and Lost Time Only**

![Graph 2]

**Figure 3: OSHA Recordable Injuries Rate, Total and Lost Time Only**

![Graph 3]
The Incident Recordable (IR) case rate represents the total recordable cases for a given year per 100 full-time employees (FTE).

The incident rate is a metric to standardize the year’s safety performance against the national and state average. The equation is as follows:

\[
\text{OSHA Incident Rate} = \frac{\text{Total number of injuries} \times 200,000}{\text{Number of hours worked by all employees}}
\]

Lost Time Cases (LTC) represents the number of OSHA recordable injuries that resulted in lost time. The LTC rate is the number of cases in a given year per 100 full-time employees. The rate is calculated using the OSHA Incident Rate calculation outlined above, however the total number of injuries are only those resulting in lost time.

In comparison of the 2011-2014 IR and LTC for the UI to the average rates for universities nationwide (Figure 4 and 5), the UI has been below the national average.

*National Data was not available for FY14 at the time of this report*
EHS formally investigates a subset of injuries each year. In FY14, the OS section conducted sixty-six (66) investigations outlined by type of injury in the table below:

**Table 2: FROI Investigations by Injury Type FY15**

<table>
<thead>
<tr>
<th>Type of Injury</th>
<th>Number of Investigations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergic Reaction</td>
<td>1</td>
</tr>
<tr>
<td>Animal Bite</td>
<td>3</td>
</tr>
<tr>
<td>Burn</td>
<td>2</td>
</tr>
<tr>
<td>Caught In</td>
<td>4</td>
</tr>
<tr>
<td>Chemical Burn</td>
<td>4</td>
</tr>
<tr>
<td>Cut</td>
<td>8</td>
</tr>
<tr>
<td>Exertion</td>
<td>19</td>
</tr>
<tr>
<td>Exposure To</td>
<td>10</td>
</tr>
<tr>
<td>Noise</td>
<td>1</td>
</tr>
<tr>
<td>Slip, Trip, and Fall</td>
<td>11</td>
</tr>
<tr>
<td>Struck By</td>
<td>3</td>
</tr>
</tbody>
</table>

The OS Section staff reviews incident and injury trends with non-laboratory and non-UIHC departments during the annual administrative audit. In addition, monthly incident reviews are done with Safety Representatives from Facility Management and Housing & Dining. The following topics were reviewed:
• The number of OSHA Recordable Injuries;
• Near miss incidents;
• The most common type of injury;
• The direct and indirect contributing factors including facilities, equipment, work practices, procedures, active management leadership, and employee involvement;
• Overall safety culture;
• The status of the department’s injury investigation process and return to work program;
• Opportunities for corrective actions; and
• Areas of focus for department administrators, including day to day performance management and safe work practices.

Indoor Environmental Quality
The Indoor Environmental Quality (IEQ) program addresses issues associated with indoor environmental quality for campus buildings. Requests are made by individuals, departments, administrators, medical providers, and staff involved with building maintenance, renovation, or construction. Issues that arise include general air quality, odors, mold, allergens, dust, thermal comfort, and noise. Underlying issues facilitated to resolution may include the overall office environment, construction impacting occupied areas, and unique or aged structures.

Investigations often include assessing the building and/or Heating, Ventilation, and Air Conditioning (HVAC) system for moisture intrusion since that is the primary facilitator of mold growth indoors. Sampling may include carbon monoxide, carbon dioxide, dust levels, formaldehyde and other chemical samples, and biological samples when indicated or requested to identify and rule out background substances more commonly associated with individual sensitivities or allergies.

Activities and Accomplishments for FY15:
• Conducted seven (7) indoor environmental quality investigations.
• Collected and interpreted results of 17 samples to assist in the investigation of various IEQ issues.

Industrial Hygiene
Industrial hygiene services are provided to evaluate various chemical and physical hazards, recommend means of hazard elimination or control, and evaluate ongoing program effectiveness.

Activities and Accomplishments for FY15:
• Performed Respirator Program Administrator services for EHS respirator programs; and provided a summary report to the EHS Director.
• Conducted a program review of fourteen (14) departments with required respirator programs.
• Provided five (5) respirator qualitative fit tests for various departments.
• Provided thirty-four (34) respirator quantitative fit tests for EHS staff.
• Conducted administrative reviews of seven (7) asbestos management programs.
• Conducted eighteen (18) administrative reviews in departments for confined space entry programs.
- Performed an additional twenty-two (22) industrial hygiene evaluations for a variety of purposes on miscellaneous issues to assess hazards, conduct air monitoring when needed, and recommend appropriate controls.
- Performed two (2) emergency responses with the Chemical Safety staff providing sampling and remediation recommendations.
- Updated training programs for Confined Space.

**Occupational Safety Section Goals for FY16**

- Continue to participate in University, UIHC, and department committees for risk control related to occupational safety and health.
- Continue to participate in the Workplace Occupational Safety and Health Work Group and sub work groups.
- Continue supporting University and UIHC needs in occupational safety including injury and illness prevention, training, safety audits, and follow-ups.
- On-board the new Industrial Hygienist - Occupational Safety Specialist and utilize his skills to continue to update and grow the role of IH going forward.
- Continue to partner with safety personnel across campus, such as in Facilities Management, Housing/Dining, Public Safety, Recreational Services, Athletics, and UIHC to continually improve our safety program throughout the University.
Radiation Safety Program

The Radiation Safety Section is responsible for administrating the University’s radiation safety program. This includes maintaining the radioactive material license, registration and compliance testing of radiation producing machines, assessing program performance, providing training and program services, and managing regulatory and policy compliance.

Administrative Programs

Radioactive Materials License Maintenance

The Environmental Health & Safety Office’s (EHS) Radiation Safety Section maintains the University’s single academic/medical radioactive materials license of broad scope that covers all uses of radioactive materials for both research and medicine. The license is issued by the Iowa Department of Public Health - Bureau of Radiological Health (IDPH-BRH) and is subject to annual IDPH-BRH on-site inspection and five-year renewal.

Activities and Accomplishments for FY15:

- Completed review of the University’s Radioactive Materials License. The license is up to date and not due for renewal until May 1, 2018. No license amendments were required or filed during FY15.
- Provided the IDPH-BRH with timely notification of changes in the University’s Certifying Official; Richard Hichwa, acted as interim Certifying Official to replace James Walker on April 3, 2015; Heather Gipson, Assistant Vice President for Research – Regulatory Affairs replaced Dr. Hichwa on July 1, 2015.
- Completed IDPH-BRH annual registration of Radiation Oncology medical physicists, personnel servicing X-Ray machines (Radiology Engineering and EHS), and personnel conducting health physics activities (EHS).
- Completed annual inventory and registration of the University’s and UIHC’s radiation producing machines and generally licensed sources with the IDPH-BRH.
- Maintained access control programs and audited compliance for each of the sites under the Increased Control Order for Radioactive Materials in Quantities of Concern.
- Routinely monitored both the Iowa Administrative Bulletin and the Federal Register for regulatory changes which may impact the radiation safety programs and notified stakeholders who are or may be affected.

License Inspection Activities for FY15

- EHS Radiation Safety staff participated in the IDPH-BRH’s on-site inspection of the University’s radioactive material license and radiation safety program from October 13 – 16, 2014. The inspection included reviews of the following: Physical Protection of Category 1 & 2 Radioactive Materials; Laboratory Security; Radiation Oncology’s High Dose Remote Afterloader, Brachytherapy Program, Linear Accelerators, and Interopertive Radiation Therapy Unit; Personnel Monitoring & Exposure Control; Laboratory Audits & Surveys; PET Production & Imaging Center; Radioactive Waste Disposal; RAM Receipt & Delivery; RAM
Use Approval Process; Instrument Calibration; and Quarterly UIHC Audits. No violations or concerns were identified within the scope of this inspection.

- EHS Radiation Safety staff participated in the IDPH-BRH’s on-site Mammography Quality Standards Act (MQSA) inspection and stereotactic breast biopsy inspection at the UIHC on November 20, 2014. No violations or concerns were identified within the scope of this inspection.
- EHS Radiation Safety staff participated in the IDPH-BRH’s on-site Mammography Quality Standards Act (MQSA) inspection at the UIHC’s Iowa River Landing (IRL) clinic on November 19, 2014. One Level 2 violation was identified for not correctly completing the repeat/reject analysis report. When the report is compiled, if the number of repeat/reject images has changed by 2% or more from the previous report, a corrective action needs to be documented. This report only needs to be compiled after 250 patients or every calendar quarter; however IRL clinic was completing the report every week. To correct the non-compliance the IRL submitted a plan on December 9, 2014 to revise its repeat/reject analysis procedure to only perform the analysis after every 250 exams or quarterly, whichever occurs first. The IDPH-BRH notified the IRL on December 15, 2014 that the corrective action plan was sufficient.

Radiation Safety Committees
The University’s Radiation Safety Committee (RSC) is comprised of five interrelated committees that function to provide radiation protection program oversight, review, policy development, and radioactive materials use authorization under the management of the Associate Vice President for Research. The radiation safety program is delegated to the RSC and the Radiation Safety Officer (RSO) who have the authority to enforce and direct University personnel regarding radioactive material regulations, license conditions, and University radiation safety policies.

1. Radiation Protection Executive Committee
The Radiation Protection Executive Committee is responsible for providing oversight and review of the University’s radiation protection program and establishing radiation safety use and enforcement policies. The Executive Committee is comprised of representatives of University administration and EHS, and the chair and vice-chairpersons of the Basic Science Radiation Protection Committee, the Medical Radiation Protection Committee, and the Hospital Radiation Safety Review Group.

Activities and Accomplishments for FY15:
- Meetings were held on December 11, 2014 and July 30, 2015.
- Reviewed and approved four quarterly UI/UIHC ALARA reports.
- Reviewed and approved RSO’s evaluative summaries of each of 30 radiation safety audits, noting and initiating corrective action for a total of 8 items of non-compliance (no items at the UIHC and 8 security violations in UI research labs). All lab security violations were corrected on discovery and follow-up noted no repeat occurrences.
- Reviewed the 2014 COMPLY radionuclide air emissions report noting that the UI/UIHC emissions (0.002 mrem/yr) were well within regulatory limits (10 mrem/yr).
- Reviewed and approved the Annual Radiation Safety Program Report for FY14.
2. Hospital Radiation Safety Review Group (HRSRG)
The Hospital Radiation Safety Review Group is responsible for the review of the University Hospital’s radiation protection program as well as the review and approval of medical authorized users and clinical uses of radioactive materials under the conditions of the University’s radioactive materials license. The membership of the HRSRG is comprised of representatives of the UIHC’s administration, nursing service, licensed physicians, and other individuals with specialized training and knowledge as necessary, and a representative from EHS. The chair and vice-chairpersons serve as representatives to the Executive Committee.

Activities and Accomplishments for FY15:
• Four quarterly and one special meeting were held during FY15.
• Reviewed and approved 5 quarterly UIHC ALARA reports.
• Reviewed 4 quarterly reports on special procedure fluoroscopy patient skin doses. No skin damage was observed during follow-up medical exams of any of the 48 patients whose conservatively calculated skin dose exceeded the 300 rad adult threshold and none that exceeded the 100 rad pediatric threshold during the 7,144 fluoroscopic special procedures completed at the UIHC.
• Reviewed 4 quarterly radiation safety reports and annual audits on the UI Family Care Clinics in Southeast Iowa City, North Liberty, and River Crossing. No items of non-compliance were identified.
• Reviewed the credentials of 2 new nuclear medicine physicians, 1 new nuclear cardiology physician and approved them as authorized users.
• Reviewed the credentials of 1 graduating resident in Nuclear Medicine and approved her as authorized user without clinical privileges.
• Reviewed the 2014 IDPH annual radioactive materials license inspection report.
• Reviewed the 2014 IDPH annual mammography inspection reports for UIHC and IRL.

3. Medical Radiation Protection Committee (MRPC)
The MRPC is responsible for ascertaining that all experimental or research uses of radiation in or on human beings conform to currently accepted radiation protection practices, regulations, and license conditions. The membership of the MRPC is comprised of licensed physicians, individuals with specialized training and knowledge, as necessary, and a representative from EHS. The chair and vice-chairpersons serve as representatives to the Executive Committee.

Activities and Accomplishments for FY15:
The MRPC held 18 meetings and approved 50 new research applications and 29 application amendments for radiation and/or radioactive materials use with humans.

4. Radioactive Drug Research Committee (RDRC)
The membership of the MRPC serves as the RDRC and is responsible for the review and approval of certain proposed uses of radioactive drugs for human research intended to obtain basic information regarding metabolism, human physiology, pathophysiology, or biochemistry, but not for diagnostic or therapeutic use or for clinical trials.
Activities and Accomplishments for FY15:
- No RDRC meetings were held during FY15 because no RDRC protocols were submitted or were active.
- The Committee Chair submitted annual membership summary to the FDA on February 18, 2015, and a membership change report on May 18, 2015.

5. Basic Science Radiation Protection Committee (BSRPC)
The BSRPC is responsible for the review of applications for non-human use of radioactive materials to ensure that they conform to currently accepted radiation protection practices, regulations and license conditions. The Committee is comprised of authorized radioactive material users from within the University’s Basic and Health Sciences. A representative from EHS also provides guidance on radiation protection regulations and policies to the Committee. The chair and vice-chairpersons serve as representatives to the Executive Committee.

Activities and Accomplishments for FY15:
- The BSRPC reviewed and approved 5 new UI applications for the non-medical use of RAM through its mail ballot process.
- The RSO reviewed and approved 66 non-medical use application amendments.
- Completed 76 non-medical use application renewals.

Radiation Safety Administrative Support Activities
The Radiation Safety Section provides administrative support for the management of both medical and basic science radioactive material use applications and the routine operational activities associated with use of radioactive materials on campus. Administrative support activities also include preparing meeting agendas and documenting minutes for the Radiation Safety Committees.

1. Medical Research Applications
Activities and Accomplishments for FY14:
- Processed and approved 50 new applications and 29 application amendments.
- Maintained the application files for 114 principal investigators with 239 active medical research-use applications.
- The table below compares this fiscal year’s medical use application activities with that of past years.

<table>
<thead>
<tr>
<th>Activity</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Protocols</td>
<td>52</td>
<td>46</td>
<td>50</td>
</tr>
<tr>
<td>Amendments</td>
<td>19</td>
<td>21</td>
<td>29</td>
</tr>
</tbody>
</table>

2. Basic Science Applications
Activities and Accomplishments for FY15
- Processed 5 new applications, 6 cancellations, 4 inactivations, 66 application amendments, and completed 76 application renewals.
- Maintained and managed 90 active authorizations for the RAM use in the basic sciences.
The table below compares this fiscal year’s non-medical use application maintenance activities with that of past years.

<table>
<thead>
<tr>
<th>Activity</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewals</td>
<td>99</td>
<td>84</td>
<td>76</td>
</tr>
<tr>
<td>Amendments</td>
<td>63</td>
<td>71</td>
<td>66</td>
</tr>
<tr>
<td>Cancellations</td>
<td>10</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Inactivation</td>
<td>9</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Reactivations</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>New Authorizations</td>
<td>9</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Active Authorizations</td>
<td>104</td>
<td>95</td>
<td>90</td>
</tr>
<tr>
<td>Total Inactive Authorizations</td>
<td>120</td>
<td>130</td>
<td>134</td>
</tr>
</tbody>
</table>

3. Other Support Activities

Activities and Accomplishments for FY15:
- Managed Radioactive Materials (RAM) Procurement Program.
- Maintained and reviewed medical & basic science applications for completeness.
- Provided administrative support for each of the five committees which make up the University’s Radiation Safety Committee.

**Operational Safety and Compliance Programs**

**University Audit Program**
EHS audits the radiation safety program to assess its performance and provides its findings, evaluations, and actions to the Radiation Protection Executive Committee. The audit schedule for the periodic review of the radiation safety program is designed to provide limited quarterly reviews of the program elements that require the performance of daily, weekly, or monthly tasks, and annual review of the performance of less time critical elements. The current audit schedule is listed below:

1. Medical
- Nuclear Medicine – Quarterly limited scope review of daily, weekly and quarterly requirements 3 times per year plus 1 full annual review.
- PET Imaging Center - Quarterly limited scope review of daily, weekly and quarterly requirements 3 times per year plus 1 full annual review.
- Radiation Oncology - Quarterly limited scope review of daily, weekly and quarterly requirements 3 times per year plus 1 full annual review.
- Patient Fluoroscopy Dose Records – Reviewed quarterly by the Hospital Radiation Safety Review Group for each department performing special fluoroscopy guided procedures as specified by IDPH-BRH Regulations.
• X-Ray Administrative Audit for Mammography- Annually for film-screen, digital and stereotactic mammography operations.
• UIHC Family Care Clinics (Southeast Iowa City, North Liberty, and River Crossing) – Annually audit their x-ray programs.

2. Basic Science
• Radiation Research Gamma Irradiation Facility - Annually during use authorization application renewal.
• Non-medical research labs – Audited monthly, quarterly, or semi-annually according to radioactive materials use.
• After Hours Security Checks – Research labs are checked periodically for RAM security during other than normal business hours.

3. EHS Radiation Safety Programs
• Operational Radiation Safety Programs – Quarterly review of room surveys, bioassay, RAM receipt and delivery, instrument calibration, and sealed source programs.
• Radioactive Waste – Four quarterly limited scope audits which review all operations at least once per year.

Activities and Accomplishments for FY15:
• Thirty program audits were completed.
• Audits identified a total of 5 items (0 UIHC & 5 UI) of regulatory or University safety policy non-compliance. Each of the 5 were first offense security violations in posted basic science research labs. Corrective actions and follow-up were implemented for each of the identified items.

4. Increased Controls Audits for RAM Quantities of Concern
• Audits of security and approved access to each of the areas affected by the increased controls order are conducted at least quarterly. No items of non-compliance were observed.

Bioassay Program
EHS monitors occupational dose commitment of radiation workers at the University with the greatest potential for internal radionuclide intake based on receipts and/or usage of radioactive material by the end users. Bioassays are also offered to monitor potential exposure to the embryo/fetus throughout gestation of female personnel declaring a pregnancy who work in areas where radioactive materials are actively used.

Activities and Accomplishments for FY15:
• Performed 88 bioassays for UI/UIHC personnel. No internal exposures exceeded 10% of our operational ALARA limit of 125 mrem effective dose equivalent. The table below provides a comparison of the total number of bioassays performed in previous years.

<table>
<thead>
<tr>
<th>Bioassay Type</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroid</td>
<td>109</td>
<td>76</td>
<td>68</td>
</tr>
<tr>
<td>Urine</td>
<td>23</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>100</td>
<td>88</td>
</tr>
</tbody>
</table>
Dosimetry Program

EHS manages and maintains the Dosimetry Program that provides external exposure monitoring for radiation workers and the embryo/fetus of declared pregnant radiation workers, as required by regulation.

Activities and Accomplishments for FY15

• Issued a total of 17,347 dosimeters to a monthly average of 834 individual participants.
• Only a total of 49 (5.9%) individuals participating in the dosimeter program received an annual occupational whole body radiation dose greater than the 100 mrem regulatory limit prescribed for members of the general public not working with radiation.
• Of the dosimeters issued, 4.4% were either returned late for processing or not returned.

Comparisons to the past two fiscal years are given below:

<table>
<thead>
<tr>
<th>Activity</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dosimeters Issued (annual total)</td>
<td>17,853</td>
<td>17,682</td>
<td>17,347</td>
</tr>
<tr>
<td>Individual Participants (monthly average)</td>
<td>851</td>
<td>847</td>
<td>834</td>
</tr>
<tr>
<td>Lost/Late Dosimeters (annual average %)</td>
<td>6.2%</td>
<td>5.4%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Percentage Issued to UI Personnel</td>
<td>8.5%</td>
<td>7.6%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Percentage Issued to UIHC Personnel</td>
<td>91.5%</td>
<td>92.4%</td>
<td>95.0%</td>
</tr>
</tbody>
</table>

• The number of individual dosimeter program participants decreased 1.5% from FY14, while the total number of dosimeters issued decreased by 1.9%.
• The number of late/lost dosimeters decreased from 5.4% to 4.4%. The Radiation Section will continue to focus effort on further reduction of late/lost dosimeters.
• Dosimeter prices and late fees were increased for the first time in over 10 years. The increased late fee from $20 to $30 may be helping to decrease the number of late returns.

ALARA Program

Dosimetry and bioassay results are reviewed by EHS to ensure exposures are maintained As Low As Reasonably Achievable (ALARA). Personnel exposures in excess of established ALARA limits are investigated by EHS. Quarterly ALARA reports, compiled by EHS, are distributed to the Radiation Executive Committee and the Hospital Radiation Safety Review Group for their review.

Activities and Accomplishments for FY15:
1. External Radiation Exposures
A. UIHC Dosimeter Participants
   • Ten UIHC participants recorded exposures (1.4% of the total UIHC dosimeter participants) that exceeded the monthly ALARA Level I limits (4% of the annual regulatory limits). Of these, 3 were whole body deep dose exposures (2 of which were determined to be falsely elevated due to improper dosimeter use), 5 lens of the eye, and 2 extremity exposures.
• One UIHC participant recorded an exposure that exceeded ALARA Level II whole body deep dose limits (8% of the annual regulatory limits). However the investigation determined the exposure was falsely elevated due to improper dosimeter use.
• Each quarter EHS performs a review of the dosimetry wear practices and dose records of up to three user groups which is included in the quarterly ALARA Reports that are reviewed by the HRSRG and Executive Committee.

B. UI Dosimeter Participants
No UI participants exceeded the institutional ALARA limits.

C. ALARA Totals
• The following table reflects the UI and UIHC department demographics of exposures in excess of the University ALARA levels.

<table>
<thead>
<tr>
<th></th>
<th>Whole Body Deep Dose Equivalent</th>
<th>Lens of Eye Dose Equivalent</th>
<th>Extremities Dose Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventional Radiology</td>
<td>1</td>
<td>Interventional Radiology</td>
<td>PET Imaging Center</td>
</tr>
<tr>
<td>Adult Cardiac Cath Lab (improper use)</td>
<td>2</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Total Level I Whole Body Deep</td>
<td>3</td>
<td>Total Level I Lens of Eye</td>
<td>Total Level I Extremities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Total FY15 Level I ALARA Exposures (2 falsely elevated due to improper use) 10

<table>
<thead>
<tr>
<th></th>
<th>Whole Body Deep Dose Equivalent</th>
<th>Extremities Dose Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Cardiac Cath Lab (improper use)</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Total FY15 Level II ALARA Exposures (falsely elevated due to improper use) 1

2. Internal Radiation Exposures
Thyroid Bioassays
• During FY15 EHS performed 68 thyroid bioassays. None of the thyroid bioassay results exceeded 10% of our 125 mrem committed effective dose equivalent ALARA limit.
Urine Bioassays

- During FY15, EHS performed 20 urine bioassays. None of the urine bioassay results exceeded 10% of our 125 mrem committed effective dose equivalent ALARA limit.

Airborne Radioactive Material Emissions

Regulations require the University to demonstrate that the atmospheric emissions from its licensed radioactive materials operations will not result in a total annual exposure in excess of 10 mrem to members of the general public. To demonstrate compliance with this requirement, EHS uses the Environmental Protection Agency’s (EPA) Clean Air Assessment Package – 1988 (CAP88). The CAP88 program is a dosimetrically conservative computer model that uses the University’s total annual inventory of radioactive materials to calculate the potential airborne dose to the general public.

Activities and Accomplishments for FY15:

- Based on the University’s total annual radioactive material inventory from January 1 through December 31st, 2014, the CAP88 Program calculated an effective dose equivalent (EDE) of 0.002 mrem to the nearest potentially exposed individual residing outside the University’s facilities. This result demonstrated that airborne emissions from the University's radioactive material usage did not exceed 0.02% of the 10 mrem/year regulatory limit.

Emergency Response and Preparedness

EHS serves as a resource unit for the UI, UIHC (including the Emergency Trauma Center (ETC)) and the Johnson County HazMat Team for emergencies involving sources of ionizing radiation.

Activities and Accomplishments for FY15:

- Members of EHS’s Spill Group engaged in an 8 hour training course and meeting to review the procedures.

Health Physics Monitoring Support

EHS provides radiation monitoring of facilities in areas where radioactive materials are used or stored: (1) to evaluate user control of exposure and contamination; (2) monitor compliance with regulations and license conditions; and (3) prior to facility maintenance or equipment disposal.

Activities and Accomplishments for FY15:

1. Room Survey Program

- Performed a total of 1,287 area and equipment monitoring surveys for academic labs and the UIHC. Surveys include routine laboratory audits, after hours security checks, facility decommissioning, posting/de-posting, pre-maintenance, spill response and post-iodination activities. A comparison of the last three fiscal years is provided below:
<table>
<thead>
<tr>
<th>Activity</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI Surveys</td>
<td>481</td>
<td>452</td>
<td>572</td>
</tr>
<tr>
<td>UI After Hours Security Checks</td>
<td>604</td>
<td>528</td>
<td>709</td>
</tr>
<tr>
<td>UIHC Surveys</td>
<td>8</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Total Surveys</td>
<td>1,093</td>
<td>989</td>
<td>1,287</td>
</tr>
</tbody>
</table>

2. Compliance Assessment Program
- Currently there are 171 UI labs posted for non-medical use of radioactive material, representing an increase of 1 lab research lab from FY14. A total of 5 regulatory compliance violations were observed by EHS during 572 routine surveys and 709 afterhours security checks of non-medical use research labs conducted in FY15. The compliance violations occurred in 5 different labs under the use authorization of 5 out of the 90 active principal investigators (5.6%). The non-compliance violations consisted of 5 first time violations for radioactive materials security. Violation notices were sent to the principal investigators and each of the violations were corrected. No second or third violation/suspension notices were issued.
- A follow-up security check for each lab in which a security violation was identified has been performed and in each case, EHS is satisfied that the problem has been corrected.

3. Decommissioning Activities
- Extensive radiation monitoring and wipe tests are completed whenever a posted radioactive material use area is decommissioned to ensure all radioactive materials have been removed and no contamination remains before deposing and releasing the area for unrestricted use.
- EHS has initiated a new laboratory closeout procedure on our web site to assist the research community in decommissioning their laboratory prior to leaving the University or relocating to another lab. The procedure is designed to ensure that all laboratory rooms, chemical storage areas, or areas where hazardous equipment or materials are used or stored need to be cleared by EHS staff before being assigned to new occupants or scheduled for renovation activities.
- During FY15, ten principal investigators used the laboratory closeout procedure to decommission their labs.

4. Air Sampling Activities
- EHS collected nine air samples during non-medical research use of Actinium-225 in FY15 that involved an approved project to determine the best method for protein labelling with the radionuclide. Each of the labelling experiments was conduct in a working fume hood and all samples indicated negligible airborne activity.

Sealed Source Leak Testing Program
The sealed source leak testing program includes wipe testing to ensure sealed source structural integrity; ambient radiation level surveys in areas where the sources are used and/or stored; and physical inventories to assure sealed source accountability and security.

Activities and Accomplishments for FY15:
- A summary of activity is given below.
Sealed Source Leak Tests

<table>
<thead>
<tr>
<th>Activity</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI</td>
<td>108</td>
<td>112</td>
<td>111</td>
</tr>
<tr>
<td>UIHC</td>
<td>269</td>
<td>241</td>
<td>249</td>
</tr>
<tr>
<td>Totals</td>
<td>377</td>
<td>353</td>
<td>360</td>
</tr>
</tbody>
</table>

- Performed 122 ambient radiation level surveys and 405 physical inventories.
- A total of 21 new sources were added to the inventory (4 UI & 17 UIHC) during FY15, while 24 sources were disposed of or returned to the original manufacturer (7 UI & 17 UIHC).
- All sources were accounted for and all leak tests were negative.

Instrument Calibration Program
Annual calibration is required for survey instruments used for quantitative radiation measurement. EHS continues to provide this service for the UI and UIHC.

Activities and Accomplishments for FY15:
- A total of 160 instruments were calibrated and 10 instruments were tagged out of service.
  A comparison of the last three fiscal years is given below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance Calibrations</td>
<td>106</td>
<td>103</td>
<td>99</td>
</tr>
<tr>
<td>Tagged Out of Service</td>
<td>15</td>
<td>13</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance Calibrations</td>
<td>58</td>
<td>61</td>
<td>61</td>
</tr>
<tr>
<td>Tagged Out of Service</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Machine-Produced Ionizing Radiation Safety Program
EHS maintains the registration with IDPH of all sources of machine-produced ionizing radiation at the University. In addition, EHS also performs radiation monitoring and machine compliance testing of each of these x-ray producing units to ensure operational safety and compliance with regulatory requirements. There are currently 289 registered x-ray units in the UIHC/UI’s inventory. The current inventory of x-ray units by type is shown below:

- 102 Diagnostic or Therapy Units
- 161 Dental Units
- 9 X-Ray Diffraction Units
- 5 Electron Microscopes
- 8 Bone Densitometer Units
- 2 Above Table X-Ray Units
- 2 Veterinary Units
- 289 Total Units
Activities and Accomplishments for FY15:

- Conducted X-ray compliance inspection surveys of all medical and dental diagnostic X-ray units in service as well as 18 research related X-ray units and 8 bone densitometer units in the University's X-ray inventory. Details for the past three fiscal years are as follows:

<table>
<thead>
<tr>
<th>X-Ray Unit Inspections</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental</td>
<td>104</td>
<td>149</td>
<td>157</td>
</tr>
<tr>
<td>UI</td>
<td>18</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>UIHC</td>
<td>92</td>
<td>97</td>
<td>98</td>
</tr>
<tr>
<td>Iowa River Landing</td>
<td>4</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>218</strong></td>
<td><strong>267</strong></td>
<td><strong>279</strong></td>
</tr>
</tbody>
</table>

- Identified 3 minor items of equipment non-compliance within the UIHC and 6 minor items with the units at the College of Dentistry. Radiology Engineering and Patterson X-ray promptly investigated and corrected all UIHC and College of Dentistry items of non-compliance respectively.

- Worked to successfully implement Joint Commission’s Revised Requirements for Diagnostic Imaging Services related to CT physicist surveys and shielding evaluations. Performed compliance testing for all clinical and research CT units at UIHC.

- Provided mammography physicist services to the UIHC and IRL to include MQSA equipment compliance checks for each of the five tomographic mammography units and one stereotactic breast biopsy unit. Three units were surveyed following the re-location of Breast Imaging from 3JPP to 4PFP. ACR re-accreditation surveys were performed for three units.

- The EHS mammography physicist performed quality control checks on all the physician review workstations in mammography, as well as on the Kodak Carestream monitors that are being integrated into PACS for use with mammographic images.

- The EHS mammography physicist participated in the IDPH-BRH’s Mammography Quality Standards Act (MQSA) and Stereotactic Breast Biopsy inspections of the Department of Radiology’s Breast Imaging Center and Iowa River Landing on November 19 - 20, 2014. No violations or concerns were identified with the UIHC’s mammography and stereotactic breast biopsy programs. The IRL mammography program did receive one Level 2 violation for not correctly completing the repeat/reject analysis report. When the report is compiled if the number of repeat/reject images has changed by 2% or more from the previous report corrective action needs to be documented. This report only needs to be complied after 250 patients or every calendar quarter; however IRL was completing the report every week. The violation was corrected and accepted by the IDPH.

- Provided health physics monitoring support for Radiation Oncology during Intrabeam™ Intraoperative Radiation Therapy (IORT or electronic brachytherapy) x-ray unit patient treatments.
Radiation Shielding Design and Construction Analysis

EHS provides radiation shielding evaluations for new construction planning and existing facilities to assist in assuring that all facilities designed for radiation producing machines and radioactive material use and storage meet applicable standards and regulations.

Activities and Accomplishments for FY15:

- Provided construction shielding plans for the UI’s Pappajohn Biological Discovery Building (PBDB), Oakdale Vivarium, College of Dentistry, and UIHC’s departments of Radiology, Orthopedics, Nuclear Cardiology, Digestive Disease, Children’s Hospital, and Iowa River Landing (IRL). The evaluations covered a wide range of equipment, including CT, cone-beam CT, mobile c-arm, as well as stationary radiographic and fluoroscopic equipment.
- Provided post construction shielding verification measurements for new x-ray rooms at UIHC’s Department of Radiology, Adult Cath Lab, the UI’s Pappajohn Biological Discovery Building (PBDB) and Dental Science Building (DSB).
- Consulted and provided shielding evaluations for remodeling projects for the UIHC’s Departments of Radiology, Adult Cardiac Cath Lab, Digestive Disease, and the UI College of Dentistry.
- Provided radiation surveys for Radiation Oncology to verify adequacy of Vault A shielding following installation of their new Elekta Versa 18 MeV Linear Accelerator external beam therapy unit.

Radioactive Materials Procurement and Shipping Program

This program oversees the receipt, distribution and documentation for all radioactive materials delivered to the University. The shipment of radioactive material is controlled and regulated by the IDPH-BRH, the DOT and the International Air Transportation Agency (IATA). These regulations specify that documented training is required for any persons involved in the shipping of radioactive material. As such, EHS provides shipping services for UI and UIHC to minimize the burden on users of radioactive materials. Shipping services involve: completing required documentation; obtaining copies of recipient’s radioactive materials licenses; preparing and packaging radioactive materials for shipment; providing training to individuals when required; and maintaining records.

Activities and Accomplishments for FY15:

- Radioactive Materials Receipt and Delivery: a total of 382 items of radioactive material were processed and delivered to UI or UIHC facilities (7.9% increase in receipts from FY14). Receipt totals from previous fiscal years are provided below for comparison.

<table>
<thead>
<tr>
<th></th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI</td>
<td>311</td>
<td>229</td>
<td>249</td>
</tr>
<tr>
<td>UIHC</td>
<td>136</td>
<td>125</td>
<td>133</td>
</tr>
<tr>
<td>Total</td>
<td>447</td>
<td>354</td>
<td>382</td>
</tr>
</tbody>
</table>

- Radioactive material inventories were maintained within the University’s license limits.
• Radioactive Materials Shipments: 27 packages were shipped for UI (7) and UIHC (20) personnel (58.8% increase in shipments from FY14). RAM shipment totals from previous fiscal years are provided below for comparison.

<table>
<thead>
<tr>
<th># Shipments</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>UI</td>
<td>3</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>UIHC</td>
<td>6</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>17</td>
<td>27</td>
</tr>
</tbody>
</table>

Radiation Safety Education Program
The EHS Radiation Safety Section provides a wide variety of radiation safety courses tailored to specific types of use and exposure. Required radiation safety training is provided both initially and annually to individuals listed on an active radioactive materials use authorization in the basic sciences and to health care workers who receive an annual radiation dose equivalent greater than 100 mrem. Completion of initial radiation safety training is also required as a prerequisite to receiving a radiation dosimeter. Health care workers providing care to brachytherapy and/or radiopharmaceutical therapy patients at the UIHC are trained annually as required by regulation. Radiation safety training for ancillary personnel is provided annually, or on an as needed basis. In addition, the EHS Radiation Section also provides laser safety training courses for both the UI researchers and UIHC medical users.

Activities and Accomplishments for FY15:
• A total of 1,524 radiation safety courses were completed during FY15, representing a 30.9% increase over FY14 totals. The numbers reflect courses taken by faculty, staff and students. A breakdown in course participation is given below:

<table>
<thead>
<tr>
<th>Radiation Safety Course</th>
<th>Total Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical X-Ray Equipment</td>
<td>25</td>
</tr>
<tr>
<td>Diagnostic X-ray - Limited</td>
<td>6</td>
</tr>
<tr>
<td>Electron Capture Detector</td>
<td>24</td>
</tr>
<tr>
<td>Laser Safety - Research</td>
<td>123</td>
</tr>
<tr>
<td>Laser Safety - UIHC</td>
<td>51</td>
</tr>
<tr>
<td>Nuclear Medicine Staff</td>
<td>31</td>
</tr>
<tr>
<td>P.E.T. Imaging Staff</td>
<td>25</td>
</tr>
<tr>
<td>Radioactive Materials Shipping</td>
<td>2</td>
</tr>
<tr>
<td>Radiation Oncology Staff</td>
<td>44</td>
</tr>
<tr>
<td>Radiation Safety, Basic</td>
<td>209</td>
</tr>
<tr>
<td>Radioactive Waste Management</td>
<td>10</td>
</tr>
<tr>
<td>Radiation Safety, Refresher</td>
<td>391</td>
</tr>
<tr>
<td>Radiation Safety CRC Staff</td>
<td>6</td>
</tr>
<tr>
<td>Radiation Safety for FM Staff</td>
<td>202</td>
</tr>
<tr>
<td>Rad Safety 3JPP Staff</td>
<td>84</td>
</tr>
<tr>
<td>Rad Safety 3RCP Staff</td>
<td>127</td>
</tr>
<tr>
<td>SAIC Radiation Safety</td>
<td>1</td>
</tr>
</tbody>
</table>
UIHC Therapy Patient Monitoring Program
EHS provides health physics support and radiation safety monitoring service for UIHC departments administering therapeutic amounts of radioactive materials to patients. Support services include post-administration radiation surveys; staff and family/visitor education and training; after hours on-call; facility decontamination; and radioactive waste collection.

Activities and Accomplishments for FY15:
- Therapy patient activities and historical comparison are provided below:

<table>
<thead>
<tr>
<th>Therapy Procedure</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-125 Eye Plaque Brachytherapy</td>
<td>43</td>
<td>34</td>
<td>42</td>
</tr>
<tr>
<td>I-125 Prostate Brachytherapy</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Ir-192 Brachytherapy</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I-131 Radiopharmaceutical Therapy</td>
<td>32</td>
<td>40</td>
<td>52</td>
</tr>
<tr>
<td>Y-90 Radiopharmaceutical Spheres</td>
<td>12</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Lu-177 Radiopharmaceutical Therapy</td>
<td>1</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Intraoperative Radiation Therapy (IORT)</td>
<td>28</td>
<td>31</td>
<td>15</td>
</tr>
<tr>
<td>Y-90 Radiopharmaceutical Therapy (DOTATOC)</td>
<td>NA</td>
<td>NA</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL Therapy Procedures</strong></td>
<td><strong>122</strong></td>
<td><strong>140</strong></td>
<td><strong>123</strong></td>
</tr>
</tbody>
</table>

- All therapies were delivered as prescribed. No reportable medical events occurred during FY15.

Laser Safety Program
EHS provides laser safety support to UI and UIHC laser users. The program includes training, consultation, unit registration, and safety audits. Currently there are 72 research lasers registered with 25 investigators at the UI and 36 medical lasers registered to 9 departments at UIHC.

Activities and Accomplishments for FY15:
- The Assistant Radiation Safety Officer serves as University’s & UIHC’s Laser Safety Officer.
- The Assistant Radiation Safety Officer also serves as a member of the UIHC Laser Safety Panel.
- Approved the purchase of new medical use lasers for the UIHC’s Departments of Ophthalmology, Surgery, Adult Cath Lab, and Iowa River Landing in conjunction with the UIHC’s Laser Safety Panel.
- A new laser treatment room was added to the two existing rooms at Iowa River Landing, and laser safety audits were completed for all three IRL laser treatment rooms.
- Performed laser safety audits of 18 UI research groups utilizing 52 lasers and 9 UIHC departments utilizing 36 lasers. EHS met with three new research laser users to register equipment and provide guidance for establishing a safe laser use environment.
- Assisted the UIHC’s Adult Cath Lab and Urology Department in correcting area entry control deficiencies in both of their laser use rooms.
- Implemented an administrative controls procedure for low use laser use areas as a cost effective alternative to installing electronic Area Entry Control systems.
- Provided equipment and area audits for new and trial use lasers.

Radioactive Waste Management Program
The EHS manages the Radioactive Waste Management Program for the UI and UIHC. The program includes: (1) collection, transportation, processing, storage and disposal of radioactive waste materials; (2) the management of required program records; (3) facility and environmental monitoring of its operation; and (4) educational support services regarding hazardous materials waste handling.

Activities and Accomplishments for FY15:
EHS dedicated 0.67 FTE to the management of radioactive waste during FY15. This effort is broken down as follows:

- **UI**: 0.39 FTE
- **UIHC-Pathology**: 0.06 FTE
- **UIHC-Radiology**: 0.19 FTE
- **VAMC**: 0.05 FTE

A summary of the radioactive waste management program is provided below with data from the previous 2 fiscal years included for comparison.

<table>
<thead>
<tr>
<th></th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summary (UI &amp; UIHC)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Pick-Ups</td>
<td>184</td>
<td>177</td>
<td>195</td>
</tr>
<tr>
<td># Items Radioactive Collected</td>
<td>644</td>
<td>616</td>
<td>768</td>
</tr>
<tr>
<td># Pieces Lead Shield Collected</td>
<td>1,172</td>
<td>994</td>
<td>480</td>
</tr>
<tr>
<td>Activity Collected – Curies</td>
<td>0.283</td>
<td>0.271</td>
<td>0.349</td>
</tr>
<tr>
<td><strong>Summary (UI &amp; UIHC)</strong></td>
<td>FY13</td>
<td>FY14</td>
<td>FY15</td>
</tr>
<tr>
<td># Containers Shipped Off-Site</td>
<td>33</td>
<td>22</td>
<td>35</td>
</tr>
<tr>
<td># Liquid Barrels Discharged</td>
<td>6</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Activity Discharged to Sewer (Curies)</td>
<td>0.058</td>
<td>0.102</td>
<td>0.005</td>
</tr>
<tr>
<td><strong># Shipping Containers Generated</strong>*</td>
<td>FY13</td>
<td>FY14</td>
<td>FY15</td>
</tr>
<tr>
<td>Animal Carcass</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Dry Waste</td>
<td>16</td>
<td>19</td>
<td>28</td>
</tr>
<tr>
<td>Liquid Waste, Aqueous</td>
<td>6</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Liquid Waste, Mixed</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>LSC Vials (Hazardous)</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>LSC Vials (Non-hazardous)</td>
<td>17</td>
<td>22</td>
<td>23</td>
</tr>
</tbody>
</table>
Other 0 0 2
Sharps 0 1 1
**Total Containers** 41 48 61

* Shipping containers may be 55-gallon drums, 30-gallon drums, pails, or yard boxes.

Any reductions in numbers are attributable to several factors, including:

- Intensive in-house processing of various waste streams;
- A reduction in the use of long-lived radioactive materials;
- Users ordering less activity for the same experimental protocols due to vendor improvements in radionuclide purity and methodologies;
- EHS involvement with researchers during audits, training and renewals which encourage ordering only the amount of activity needed and correct identification of radioactive waste;
- A shift towards research using biochemical alternatives rather than radioactive materials.

EHS processes some radioactive waste via in-house methods to reduce disposal costs charged back to the University due to disposal at a low-level radioactive waste burial site. A summary of the number of containers processed by in-house methods and the number of drums eliminated from radioactive burial is shown below. Cost saving resulting from in-house processing and/or material segregation of radioactive materials is listed below:

<table>
<thead>
<tr>
<th># Processed</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Linens Decay-In-Storage (containers)</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sharps Decay-In-Storage (containers)</td>
<td>41</td>
<td>47</td>
<td>0</td>
</tr>
<tr>
<td>Dry Waste Decay-In-Storage (drums)</td>
<td>9</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Dry Waste Incineration (containers)</td>
<td>66</td>
<td>70</td>
<td>78</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>119</td>
<td>82</td>
<td>78</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th># of Drums Eliminated from Radioactive Waste Burial</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Waste Decay-In-Storage</td>
<td>9</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Sharps</td>
<td>0.5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Dry Waste Incineration</td>
<td>5</td>
<td>5</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14.5</strong></td>
<td><strong>13</strong></td>
<td><strong>5.5</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Waste Processing Cost Savings</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Waste Decay-In-Storage</td>
<td>$14,700</td>
<td>$ 8,200</td>
<td>$ 0</td>
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<tr>
<td>Sharps Decay-In-Storage</td>
<td>$ 10,500</td>
<td>$ 17,500</td>
<td>$ 0</td>
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</tbody>
</table>
Radiation Safety Program Goals for FY16

- Continue preparing for implementation of the new security requirements for radionuclides in quantities of concern that were published on June 11, 2014, in the Iowa Administrative Code 641-Chapter 37 – Physical Protection of Category 1 & 2 Quantities of Radioactive Material. The Chapter 37 requirements go into effect for agreement states by March 19, 2016.
- Continue the transfer of paper radiation safety records and files to an electronic, searchable format.
- Continue to work towards implementation of fluoroscopy user credentialing program.
- Complete integration of laser safety audits into EHS Assistant.
- Ensure that all the revised Joint Commission Requirements for Diagnostic Imaging Services are being met.
- Work with Interventional Radiology staff to help reduce lens of eye dose.
- Provide radiation safety support to forthcoming research projects involving substantial radioactive materials in-patient time.
Administrative Services Section

The Administrative Services Section provides information management and administrative support for all EHS program areas.

General Administrative Activities
Scope: The purpose of the General Administrative Activities Program is to provide budgetary, human resource, and administrative support to all EHS programs and staff. These activities are performed by the Unit HR Unit Rep, Administrative Services Coordinator and Clerk IV with oversight provided by the OVPR&ED Compliance Unit Business Manager.

Activities for FY15:
Approximately 4,164 hours were expended on general office support for EHS staff. The breakdown of activities and approximate time required for each is listed below:

- **Biosafety Cabinet Program Support.** Approximately 45 hours were spent on support for the biosafety cabinet certification program. Activities include scheduling appointments with investigators and serving as a liaison between laboratory staff and an outside contractor.

- **Financial Accounting.** Approximately 490 hours were spent on budget and accounting activities. These included reconciling monthly financial statements, performing billing functions, tracking expenditures, initiating transactions, processing vouchers and assisting with budget preparation.

- **General Clerical.** Approximately 2,069 hours were spent on general clerical support activities. These activities included directing incoming telephone calls, assembling reports, correspondence, copying, maintaining files, initiating forms, desktop publishing, personal computer data management, office equipment maintenance, office supply inventory management, and mail distribution.

- **Human Resources.** Approximately 555 hours were spent on human resources activities. These activities include maintaining confidential employee records, reconciling monthly leave records, initiating workflow transactions, communicating information to staff, search administration, attending HR Unit Rep meetings, initiating and participating in rewards and recognition program, problem resolution, and professional development.

- **Special Projects.** Approximately 861 hours were spent on special projects. These activities include collecting statistical information, producing specialized reports, attending meetings, participating in EHS internal committees, professional development, and providing support to Director and Business Manager.

- **Publications.** Approximately 118 hours were spent on production and distribution of the bi-monthly Lab News newsletter and other publications.

- **Staff Training Records Program.** Approximately 26 hours were spent on the administering of internal training and professional development records for EHS staff.
Activities and Accomplishments for FY15:

HR Unit Rep

• Participated in the recruitment and onboarding of eight positions:
  o Three Environmental Safety Coordinators (Casella, Zickefoose & Hrovat)
  o Two Biosafety Specialists (Dockstader & Kieler)
  o Associate Biological Safety Officer (Sreedharan)
  o Occupational Safety Manager (Paulsen)
  o Occupational Safety Specialist (Newnum)
• Assisted with the departure of four staff retirees (Lindenboom, Ibsen, Hiratzka & Taylor)
• Reconciled monthly leave records for EHS and the other Research Compliance units.
• Assisted staff with implementation of the new Time and Attendance application.

Administrative Services Coordinator

• Assisted biosafety staff with BSC certification scheduling and billing
• Assisted other Research Compliance units with monthly leave reconciliation.
• Served as Wellness Ambassador for EHS.
• Trained with Merry to learn accounting and billing responsibilities.

Web Information Hosting and Publications

Scope: The purpose of web information hosting and publications is to provide Web hosting services to EHS’s program activities. The activities are performed by the Training/IT Administrator.

Activities and Accomplishments for FY15

Approximately 1,081 hours were spent on web information hosting, publications, and web-based training. These activities include development and maintenance of EHS’s web site, implementing and maintaining ICON training by updating/adding new courses.

• ICON Training Course Activities
  o 16,178 ICON courses were completed.
  o 87 courses were available.
  o Reset 87 course grade books on January 1, 2015 to provide proper course completion date stamping in the individual’s HR Training record.
Training and Education Program

Scope: EHS’s training and education program addresses the University community’s need for regulatory compliance and professional development in the areas of hazardous materials, emergency preparedness, health and safety and use of personal protective equipment enabling staff to perform their respective jobs safely. See the tables below for statistical information. These data reflect staff usage of courses only and do not include students.

<table>
<thead>
<tr>
<th>Type</th>
<th>FY15</th>
<th>FY14</th>
<th>FY13</th>
<th>FY12</th>
<th>FY11</th>
<th>FY10</th>
<th>FY09</th>
<th>FY08</th>
<th>FY07</th>
<th>FY06</th>
<th>FY05</th>
<th>FY04</th>
<th>FY03</th>
<th>FY02</th>
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<tbody>
<tr>
<td>Classroom</td>
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<tr>
<td>Self-Instruction</td>
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<td>VA In-Service</td>
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<td>26</td>
<td>4</td>
<td>26</td>
<td>28</td>
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<td>Web - ClarityNet</td>
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<td>3963</td>
<td>3141</td>
<td>4979</td>
<td>4518</td>
<td>2441</td>
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<tr>
<td>Total</td>
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<td>17,396</td>
<td>16010</td>
<td>13722</td>
<td>13544</td>
<td>13778</td>
<td>14693</td>
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<td>11309</td>
<td>7474</td>
<td>5759</td>
<td>5717</td>
<td>4360</td>
<td>4622</td>
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The following table summarizes the training statistics for each EHS course.

<table>
<thead>
<tr>
<th>ICON Courses</th>
<th>Number</th>
<th>Number</th>
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<tbody>
<tr>
<td>Advanced Biological Safety</td>
<td>40</td>
<td>Safety Leadership</td>
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<tr>
<td>Aerial Lifts</td>
<td>25</td>
<td>SAIC Radiation Safety</td>
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<tr>
<td>Analytical X-Ray Equipment</td>
<td>22</td>
<td>Sealed Sources Radiation Safety</td>
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<tr>
<td>Asbestos Awareness</td>
<td>543</td>
<td>Shipping Infectious Substances</td>
</tr>
<tr>
<td>Basic Biological Safety</td>
<td>700</td>
<td>Shipping with Dry Ice</td>
</tr>
<tr>
<td>Biological Safety Cabinets</td>
<td>55</td>
<td>SPCC: Oil Spill Prevention</td>
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<tr>
<td>Bloodborne Pathogen Refresher</td>
<td>1244</td>
<td>Spill Preparedness Response</td>
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<tr>
<td>Bloodborne Pathogens, CPH</td>
<td>68</td>
<td>Tool Safety</td>
</tr>
<tr>
<td>BBP for FM, Housing &amp; Dining</td>
<td>678</td>
<td>Toxins, Select Agent Quantity</td>
</tr>
<tr>
<td>Bloodborne Pathogens, Lab</td>
<td>645</td>
<td>Universal Waste Management</td>
</tr>
<tr>
<td>Bloodborne Pathogens, Non-Lab</td>
<td>487</td>
<td>Walking and Working Surfaces</td>
</tr>
<tr>
<td>Chemical Fume Hoods</td>
<td>104</td>
<td>Welding &amp; Cutting</td>
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<tr>
<td>Chemical Storage Safety</td>
<td>158</td>
<td>X-ray Safety for Fluoro Staff</td>
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<tr>
<td>Compressed Gas Safety</td>
<td>160</td>
<td>X-ray Safety, Fluoro Doctors</td>
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<tr>
<td>Confined Space – Reclass/Alter</td>
<td>64</td>
<td>X-ray Safety, General</td>
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<tr>
<td>Confined Space Prohibited</td>
<td>13</td>
<td>X-ray Safety, Limited</td>
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<tr>
<td>Contingency Plan Training</td>
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<td>Y-90 Microspheres Rad Safety</td>
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<td>Controlled Substances Research</td>
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<td>Electrical Safety</td>
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<td>ICON Courses</td>
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<tr>
<td>Electron Capture Detector</td>
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<td>Ergonomics - Back Safety</td>
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<td>Ergonomics - Computer Use</td>
<td>224</td>
<td>Fire Extinguishers</td>
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<tr>
<td>Forklifts</td>
<td>39</td>
<td>Formaldehyde Safety</td>
</tr>
<tr>
<td>GHS Labels and SDs (renamed HazCom w/GHS)</td>
<td>1268</td>
<td>Hand Safety</td>
</tr>
<tr>
<td>Hazardous Waste for Labs</td>
<td>1032</td>
<td>Hazardous Waste for Non-Labs</td>
</tr>
<tr>
<td>HazCom with GHS</td>
<td>569</td>
<td>Hearing Conservation</td>
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<tr>
<td>Indoor Cranes</td>
<td>2</td>
<td>Lab Chemical Safety</td>
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<tr>
<td>Ladders</td>
<td>249</td>
<td>Laser Safety - Research</td>
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<tr>
<td>Laser Safety - UIHC</td>
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<td>Lead Safety Awareness</td>
</tr>
<tr>
<td>Lockout/Tagout Safety</td>
<td>86</td>
<td>Machine Guarding</td>
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<tr>
<td>Nanomaterials Research Safety</td>
<td>25</td>
<td>Nuclear Medicine Staff</td>
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<td>Office Safety</td>
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<td>P.E.T. Imaging Staff</td>
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<td>Pandemic Influenza Dust Mask</td>
<td>10</td>
<td>PPE Awareness for Labs</td>
</tr>
<tr>
<td>PPE Awareness for Non-Labs</td>
<td>202</td>
<td>Rad Safety 3JPP Staff</td>
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<tr>
<td>Rad Safety for 3RCP</td>
<td>107</td>
<td>Rad Safety CRC Staff</td>
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<tr>
<td>Radiation Oncology Staff</td>
<td>39</td>
<td>Rad Safety for FM Staff</td>
</tr>
<tr>
<td>Radiation Safety - CS Staff</td>
<td>2</td>
<td>Radiation Safety, Basic</td>
</tr>
<tr>
<td>Radiation Safety, Refresher</td>
<td>322</td>
<td>Radioactive Materials Shipping</td>
</tr>
<tr>
<td>Radioactive Waste Management</td>
<td>10</td>
<td>RDNA Research, NIH Guidelines</td>
</tr>
<tr>
<td>Respirator PAPR Tight Fit Face</td>
<td>71</td>
<td>Respirator PAPR Hood or Helmet</td>
</tr>
<tr>
<td>Respirator Tight Fit Facepiece</td>
<td>101</td>
<td>Respirator Voluntary Use</td>
</tr>
<tr>
<td>Respirator: Dust Mask</td>
<td>52</td>
<td>Safe Trailering - discontinued</td>
</tr>
</tbody>
</table>
EHS Committee Activities

EHS staff members are involved in the following campus committees, subcommittees, and workgroups:

- Institutional Animal Care and Use Committee
- Basic Science Radiation Protection Committee
- College of Dentistry Nitrous Oxide Oversight Committee
- Emergency Preparedness Planning Committee
- Employee Health and Safety Work Group
- Facilities Design Center Committee
- Fire Safety Advisory Group
- Flood Emergency Response Team
- FM Safety Steering Committee
- Hospital Radiation Safety Review Group
- Institutional Biosafety Committee
- Integrated Health Management Advisory Group
- Medical Radiation Protection Committee
- Minors on Campus Committee
- Pharmaceutical Safety Committee
- Radiation Protection Executive Committee
- Radioactive Drug Research Committee
- UI Medical Surveillance Workgroup
- UI Pre-Disaster Mitigation Plan Steering Committee
- UIHC Environment of Care Committee
- UIHC Hazardous Materials Workgroup
- UIHC Indoor Air Quality Workgroup
- UIHC Laser Safety Panel
- UIHC Safety Education Workgroup
- UIHC Staff Safety & Health Council
- Workplace Occupational Safety and Health Working Group
ATTACHMENTS
Weight of Chemical Waste Generated, by Barrel Fill Type

OT = other
BM = bulk mixed
BO = bulk other
BS = bulk solvent
BL = bulk-labpacks
LA = labpacks
<table>
<thead>
<tr>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Animal</td>
<td>87</td>
<td>68</td>
<td>45</td>
<td>3</td>
<td>11</td>
<td>1</td>
<td>9</td>
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<td>Ash</td>
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<td>2</td>
<td>0</td>
<td>2</td>
<td>0</td>
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<td>0</td>
</tr>
</tbody>
</table>

Bactec Vials

Dry (Box) - 0.1 Yard Box  
115 105 131 90 123 129 103

Dry (Box) - Yard Box  
2 15

Dry (Drum)-Long  
38 30 18 11 12 7 9 7 3 3

Dry (Drum)-Short  
122 105 97 88 87 61 63 48 45 42

Dry (Drum)-Total  
160 135 115 99 99 68 72 55 48 45

Liquids-Aqueous  
53 45 36 42 34 29 37 28 26 35

Liquids-Mixed  
20 17 12 15 10 9 10 8 5 6

Liquids-Total  
73 62 48 57 44 38 47 36 31 41

LSC Vials (Vials)  
92 74 58 51 37 28 20 18 15 13

Sharps-Long  
3 3 2 1 3 2 2 3 1 2

Sharps-Short  
5 3 3 2 2 1 6 1 2 1

Sharps-Total  
8 6 5 3 5 3 8 4 3 3

Sealed Source  
0 2 3 3 2 1 1 2 1 1

Total  
428 353 394 326 331 229 282 246 207 118

Waste Generation Statistics

<table>
<thead>
<tr>
<th>Waste Type</th>
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<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
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<tbody>
<tr>
<td>Animal</td>
<td>17</td>
<td>7</td>
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<td>5</td>
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<td>12</td>
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<tr>
<td>Ash</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Bactec Vials

Dry (Box) - 0.1 Yard Box  
2 15

Dry (Box) - Yard Box  
8 7 5 6 5 4 5 4 5 5

Dry (Drum)-Long  
5 3 5 5 4 3 3 3 2 1

Dry (Drum)-Short  
36 29 30 20 20 13 13 10 6 20

Dry (Drum)-Total  
41 32 35 25 24 16 16 13 8 21

Liquids-Aqueous  
25 21 18 17 16 11 8 6 5 5

Liquids-Mixed  
6 4 1 1 0 1 0 1 1 0

Liquids-Total  
31 25 19 18 16 12 8 7 6 5

LSC Vials (Mixed)  
13 14 13 8 8 3 9 0 0 1

LSC Vials (Nonhaz)  
19 15 19 19 18 21

Sharps-Long  
3 3 2 1 1 1 0 0 1 1

Sharps-Short  
1 0 0 0 0 0 0 0 0 0

Sharps-Total  
4 3 2 1 1 1 0 0 1 1

Sealed Source  
2 1 1 0 1 0 0 0 0 0

Total  
116 91 76 63 82 57 63 55 38 55

Waste Containers (excludes lead)  
1,812 1,468 1,366 1,255 1,129 925 865 776 664 731

Lead shielding (pieces)  
3,532 2,386 2,097 2,444 2,192 2,061 2,532 1,773 984 901

Incoming Packages  
1,207 1,254 1,147 1,001 817 766 385 501 264 390
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</thead>
<tbody>
<tr>
<td><strong>Chemical Waste</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Stops</td>
<td>1,931</td>
<td>2,541</td>
<td>2,992</td>
<td>2,728</td>
<td>2,831</td>
<td>2,786</td>
<td>2,819</td>
<td>3,026</td>
<td>3,277</td>
<td>3,454</td>
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<td>Containers</td>
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<td>12,326</td>
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<td>21,198</td>
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<td>25,519</td>
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<td>Weight (kg)</td>
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<td>60,259</td>
<td>62,531</td>
<td>75,810</td>
<td>70,768</td>
<td>77,162</td>
<td>66,444</td>
<td>86,113</td>
<td>103,611</td>
<td>121,34</td>
<td>119,960</td>
<td>127,095</td>
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<tr>
<td><strong>Radiation Waste</strong></td>
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<td>Stops</td>
<td>2,533</td>
<td>2,756</td>
<td>2,596</td>
<td>2,104</td>
<td>1,816</td>
<td>1,581</td>
<td>1,358</td>
<td>1,177</td>
<td>1,117</td>
<td>942</td>
<td>934</td>
<td>798</td>
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<tr>
<td>Containers (excludes lead)*</td>
<td>6,283</td>
<td>5,259</td>
<td>4,738</td>
<td>4,153</td>
<td>3,703</td>
<td>3,373</td>
<td>2,745</td>
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<td>2,762</td>
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<tr>
<td>Lead shielding (pieces)</td>
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*Collection and accounting method changed in 1995. Lead shields are accounted for separately.

*EHS assumed responsibility for the biohazardous waste program in mid-year 2007
### Annual Statistical Summary of Radiation Safety Program

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*ALARA Levels changed beginning FY09 – Operational levels discontinued.

#11 Were Falsely Elevated Due To Improper Use

---* Information no longer available.

#3 Were Falsely Elevated Due To Improper Use
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<td>17</td>
<td>14</td>
<td>20</td>
<td>53</td>
<td>66</td>
<td>17</td>
<td>5</td>
<td>34</td>
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</tbody>
</table>

**Chemical Safety Program Summary**

<table>
<thead>
<tr>
<th></th>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Assessments Conducted</td>
<td>40</td>
<td>29</td>
<td>29</td>
<td>40</td>
<td>46</td>
<td>52</td>
<td>100</td>
<td>101</td>
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<tr>
<td>Personal and Area Chemical Monitoring (samples/measurements taken)</td>
<td>5</td>
<td>21</td>
<td>16</td>
<td>22</td>
<td>7</td>
<td>21</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Chemical Inventory System (# of PIs/users)</td>
<td>400</td>
<td>590/1030</td>
<td>530/1400</td>
<td>554/1363</td>
<td>547/1331</td>
<td>549/1607</td>
<td></td>
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</tr>
<tr>
<td>No. of inventory items</td>
<td>83,000</td>
<td>103,000</td>
<td>111,700</td>
<td>165,958</td>
<td>163,782</td>
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<tr>
<td>Fume Hood Evaluations</td>
<td>773</td>
<td>764</td>
<td>664</td>
<td>892</td>
<td>863</td>
<td>876</td>
<td>870</td>
<td>881</td>
</tr>
<tr>
<td># of hoods referred to FM</td>
<td>112</td>
<td>65</td>
<td>45</td>
<td>163</td>
<td>126</td>
<td>138</td>
<td>72</td>
<td>189</td>
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<tr>
<td>Bio/Chemical Lab Reviews Conducted (Safety Advisor Team)</td>
<td>388</td>
<td>384</td>
<td>364</td>
<td>379</td>
<td>358</td>
<td>394</td>
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<td>Spill Response Consultations</td>
<td>11</td>
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<td>18</td>
<td>14</td>
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<tr>
<td># PIs sponsored by USAMRMC/DOD</td>
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<td>17</td>
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<td>15</td>
<td>16</td>
<td>11</td>
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<tr>
<td>Respirator Program lab use reviews new/current total users</td>
<td>124</td>
<td>100</td>
<td>75/140</td>
<td>32/164</td>
<td>21/175</td>
<td>13/194</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*New program - 2011; ** new program - 2012